



भारतीय प्रौद्योगिकी संस्थान गुवाहाटी  
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
[www.iitg.ac.in](http://www.iitg.ac.in)

# ANNUAL REPORT

## 2023-2024







# ANNUAL REPORT

2023-2024



**Indian Institute of Technology Guwahati**

**Guwahati 781039, INDIA**



Indian Institute of Technology Guwahati was established in the year 1994 and has completed 25 years of glorious existence. IIT Guwahati is the only academic institution in India that occupied a place among the top 100 world universities – under 50 years of age – published by London based Times Higher Education (THE) in the year 2014 and continues to do this even today in various International Rankings. In the recently announced QS Ranking 2024 IIT Guwahati has secured 32nd rank globally (37th in 2023) in the 'Research Citations per Faculty' category. The Institute has gained rank =364 in World University Ranking globally. IIT Guwahati was ranked 6th globally in 'Affordable and Clean Energy' in the THE Impact Ranking 2023. IIT Guwahati has retained the 7th rank among the best engineering institutions of the country in the 'India Rankings 2023', also achieved the rank of 9th in the 'Overall' category and 9th position in 'Research Institutions' category in this year (2023) declared by National Institutional Ranking Framework (NIRF) of the Union ministry of Human Resource Development (HRD). IIT Guwahati also ranked 3rd in the category of 'Residential University - AICTE' in the third edition of annual 'Swachh Campus Ranking 2019' for higher educational institutions organised by MoE. IIT Guwahati has one of the most beautiful educational campuses in the country that provides an ideal setting for learning and research. It is strongly believed that IIT Guwahati has been able to fulfill the aspirations of people of the North East region to a larger extent, since its birth was through Assam Accord signed in 1985. The institute is fully residential for the students, enriched with world-class facilities and is empowered with a young and dynamic faculty and staff. The vision of IITG is to become a preferred destination of seeking best science, engineering and technology education and to be recognized internationally for excellence in research, pursuit for developmental activities and deep concern for students' care. An important feature of academic excellence is the continuous replenishment of ideas and creation of new areas of research and innovation, attracting organizations seeking collaboration in education, research and development as well as product development. In a fast changing world, keeping pace with the ever-increasing number of areas of research and application poses a major challenge to this Institute. IIT Guwahati is trying to augment the research initiatives in all the areas of Sciences and Technology in general and in Nano-science & technology, Bioengineering and Data sciences in particular. Initiation of research in some of the cutting edge areas of Biological sciences namely Genomics, Developmental Biology, Health Care and Bioinformatics, Flexible Electronics, Advanced Functional Materials, Sustainable Polymers, Water Resources and Management is a testament to the aspiration of IIT Guwahati to excel in research. The Scope of Environmental Science and Data science is inherently interdisciplinary and expanding rapidly. Recognizing the challenges for environmentally sustainable development, IIT Guwahati emphasizes an interdisciplinary research paradigm in Energy and Environment. There is a pressing need to integrate environmental engineering and sciences across various disciplines to solve problems that have important societal impact. It is indeed a challenging task to match the ever-increasing need for funds and providing infrastructure for these emerging and futuristic research areas, and IIT Guwahati has resolutely taken this challenge in its stride.

Further, IIT Guwahati has set goals to be recognized as one of the world's top 150 Institutes/Universities within the next five years. This will include attracting external grants and research funding at the level of internationally well ranked Institutes, to furnish state-of-the-art facilities for all programs, attract International faculty and students to spend time at IIT Guwahati, enhance the perception globally, fostering academic excellence and freedom while maintaining rigorous academic standards and to become a preferred destination for transformative educational experience.





<b>Particulars</b>	<b>2022-23</b>	<b>2023-24</b>
Student Strength	8163	8405
Faculty Strength	436	445
R &D Funds Received (In crores)	494	235.13
Total Research Publications	2468	2385

### Major R&D Project Received:

<b>Sl. No.</b>	<b>Department/ Centre</b>	<b>Principal Investigator</b>	<b>Project Title</b>	<b>Funding Agency</b>	<b>Sanctioned Amount</b>
01	Electronics and Electrical Engineering	Prof. Gaurav Trivedi	Design and Development of AI/ML Co-Processor and Post Quantum Cryptography Co-Processor (An initiative towards Electronics System Design and Manufacturing in North-East Region)	DEITY	199990000
02	Public Relations Branding & Ranking	Prof. P. K. Iyer	Implementation of Various RAA Activities and Tinkering Lab in Meghalaya	Govt. of Meghalaya	135705000
03	Public Relations Branding & Ranking	Prof. P. K. Iyer	Implementation of Secondary level RAA Activities and Tinkering Lab for SSA Assam	Govt. of Assam	133318600
04	Electronics and Electrical Engineering	Prof. Ratnajit Bhattacharjee	Development of 6G THz Test Bed with Orbital Angular Momentum and Multiplexing	Department of Telecommunication	56753400

05	Mechanical Engineering	Prof. Shrikrishna Nandkishor Joshi	Setting up Center of Excellence (CoE) in Sustainable & Innovative Design and Manufacturing of Polymer Toys	Chemical& Petrochemicals	50000000
06	Centre for Sustainable Polymers	Prof Vimal Katiyar and Dr. Amit Kumar	Biodegradable Toys Centre for Sustainable Livelihood Empowerment of ST community "(GREEN Putola Centre)" Green toys from Assam.	DST	23284710
07	SHST	Rajiv Kumar Kar	Evaluation of Cervical Cancer Disease Progression and Testing Strategy by Point of Care Device &HPV Testing in HIV positive Women in Manipur.	ICMR	17999640
08	Chemical Engineering	Mihir Kumar Purkait	Incorporation of advanced technology as Retrofitting for the removal of Fluoride from the PWSS at (a) Nizbbogai (b) Rajapara 2 and (c)Sakhati, in Boko town of Kamrup District, Assam.	Jal Jeevan Mission (NJJM)	16005000
09	Electronics and Electrical Engineering	Dr. Srinivasan Krishnaswamy	Developing a post quantum lattice based block cipher	Ministry of Education	9990000
10	Public Relations Branding & Ranking	Prof. P. K. Iyer	Residential Teachers Training 2023-24	Govt. of Assam	9834000



## MAJOR NATIONAL AND INTERNATIONAL CONFERENCES ORGANIZED

Sl. No.	Name Of Conference / Seminar/Workshop	Department/ Centre	Date
01	Indo-Japan Bilateral Symposium (IJBS-2023) on Technologies for Bio Economic Development of NER".	Bioscience & Bioengineering	March 03-04, 2023
02	North East Research Conclave (NERC)-2022; Sustainable Science and Technology	Chemistry	May 20-22, 2022
03	Spring School 2023 Ministry of Education, Culture, Sports, Science and Technology, Japan	Chemical	March 03-04, 2023
04	International Workshop on Scaling Blockchains: From Bitcoin to the Lightning Network	Computer Science	August 23, 2022
05	Research Workshop on 'Problem based Learning' At ICoRD'23	Design	January 11, 2023
06	National Conference on Communications 2023	EEE	February 23-26, 2023
07	ISS Young Researchers' Workshop	Humanities	December 18-19, 2022
08	Annual Foundation School -III (AFS-III)	Maths	June 20-July 16, 2022
09	International Conference on Biomaterials, Regenerative Medicine and Devices (BIO-Remedi 2022).	Mechanical	Dec 15, 2022 -Dec 18, 2022
10	Structured Light and Spin-Orbit Photonics 2022	Physics	November 29 - December 02, 2022



## Annual Report 2023-24: A Quick Look

Department/Centre/School	
Academic Department	11
Academic Centre	09
Schools	05
Extramural Centre	05

Students Admitted	
Preparatory	03
BTech/BDes	996
MTech/MDes	658
MSc/MA	228
PhD	385
MS (R)	17
Dual Degree	04
MBA	23
<b>Total</b>	<b>2314</b>

Student Strength	
Preparatory	03
BTech/BDes	3911
MTech/MDes	1440
MSc/MA	472
PhD	2446
MS (R)	59
Dual Degree	35
MBA	39
<b>Total</b>	<b>8405</b>

Number of degree awarded in 25 <sup>th</sup> Convocation	
BTech/BDes	760/56
MTech/MDes	630/29
MSc	157
MA	43
MS (R)	33
PhD/Dual Degree	303
<b>Total</b>	<b>2011</b>

Staff Strength	
Academic Staff/ Faculty	445
Technical Staff (Group A)	70
Administrative Staff (Group A)	31
Technical & Administrative Staff (Group B&C)	415
<b>Total</b>	<b>961</b>

Research Papers	
Research Publications	2386
<b>Total</b>	<b>2386</b>

Grants (In Crores)	
Revenue	457,02,00,000
Capital	85,00,00,000
R&D (Sanctioned)	38,90,00,000
<b>Total</b>	<b>542,02,00,000</b>

Consultancy Projects	
New Projects	329
<b>Total</b>	<b>329</b>

Sponsored Research Projects	
New Projects	127
<b>Total</b>	<b>127</b>

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Civil Engineering  
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Design  
Electronics and Electrical Engineering  
Humanities and Social Sciences  
Mathematics  
Mechanical Engineering  
Physics

### **ACADEMIC CENTRES**

Centre for Disaster Management and Research  
Centre for Drone Technology  
Centre for the Environment  
Centre for Indian Knowledge Systems  
Centre for Intelligent Cyber Physical Systems  
Centre for Linguistic Science and Technology  
Centre for Nanotechnology  
Centre for Sustainable Polymers  
Centre for Sustainable Water Research

### **EXTRAMURAL CENTRES**

Centre for Education Technology  
Centre for Creativity  
Central Instruments Facility  
Lakshminath Bezbaroa Central Library  
Centre for Career Development



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## **PART I**

Organisation

IIT Council

Board of Governors

Senate

Finance Committee

Building & Works Committee

Executive Summary







## ORGANISATION

### **Chairman, Council of IITs**

Union Minister for Ministry of Education

### **Chairman, Board of Governors**

Dr. Rajiv I. Modi

### **Officiating Director**

Prof. Parameswar K. Iyer (up to 06.11.2023)

Prof. Rajeev Ahuja (from 07.11.2023)

### **Dean, Academic Affairs**

Prof. Kanduru V. Krishna

### **Dean, Faculty Affairs**

Prof. T. Punniyamurthy (upto 27.06.2023)

Prof. S. Ravi (from 28.06.2023)

### **Dean, Research & Development**

Prof. Vimal Katiyar

### **Dean, Students' Affairs**

Prof. Anamika Barua (upto 05.10.2023)

Prof. A. Perumal (from 06.10.2023)

### **Dean, Infrastructure Planning & Management**

Prof. M. K. Bhuyan

### **Dean, Alumni and External Relations**

Prof. Mihir Kumar Purkait (upto 04.03.2024)

Prof. Sumana Dutta (from 05.03.2024)

### **Dean, Outreach Education Programme**

Prof. A. S. Achalkumar (from 16.03.2021)

### **Dean, Public Relations, Branding and Ranking**

Prof. P. K. Iyer

### **Dean, Industrial Interactions & Special Initiatives**

Prof. G. Krishnamoorthy

### **Dean, Resource Generation and Finance**

Prof. Rajib Kr. Bhattacharjya

### **Registrar (In-charge)**

Prof. G. Krishnamoorthy

### **Librarian**

Dr. Tamal Kumar Guha

### **Head, Department of Biosciences and Bioengineering**

Prof. Rakhi Chaturvedi

### **Head, Department of Chemical Engineering**

Prof. Kaustubha Mohanty

### **Head, Department of Chemistry**

Prof. Gopal Das (upto 30.04.2023)

Prof. Aditya Narayan Panda (from 01.05.2024)

### **Head, Department of Civil Engineering**

Prof. Sharad Gokhale

### **Head, Computer Science & Engineering**

Prof. J. K. Deka (upto 11.06.2023)

Prof. T. Venkatesh (from 12.06.2023)

### **Head, Department of Design**

Dr. Sougata Karmakar

**Head, Department of Electronics & Electrical Engineering**

Prof. Roy P. Paily (upto 12.02.2024)  
Prof. Harshal B. Nemade (from 13.02.2024)

**Head, Department of Humanities & Social Sciences**

Prof. Sukanya Sharma (upto 12.07.2023)  
Prof. Priyankoo Sarmah (from 13.07.2023)

**Head, Department of Mathematics**

Prof. Kalpesh Kapoor (upto 12.07.2023)  
Prof. Natesan Srinivasan (from 13.07.2023)

**Head, Department of Mechanical Engineering**

Prof. K. S. R. K. Murthy

**Head, Department of Physics**

Prof. Perumal Alagarsamy

**Head, Computer and Communication Centre**

Prof. Ratnajit Bhattacharjee

**Head, Centre for Disaster Management and Research**

Dr. Sudip Mitra (upto 13.02.2024)  
Prof. Arunasis Chakraborty (from 14.02.2024)

**Head, Centre for Intelligent Cyber-Physical Systems**

Prof. S. K. Dwivedi (upto 15.02.2024)  
Prof. S. Kanagaraj (from 16.02.2024)

**Centre for Drone Technology**

Prof. Pradip Kr. Das (From 07.11.2022)

**Head, Centre for Central Instruments Facility**

Prof. G. Pugazhenthii (upto 24.09.2023)  
Prof. Gagan Kumar (from 25.09.2023)

**Head, Centre for Environment**

Prof. Utpal Bora (upto 13.02.2024)  
Prof. Animes Kr. Golder (from 14.02.2024.)

**Head, Centre for Educational Technology**

Prof. T.V. Bharat

**Head, Centre for Nanotechnology**

Prof. Akshi Kumar A. S.

**Head, Centre for Indian Knowledge System**

Prof. Uday Shanker Dixit

**Head, Centre for Linguistic Science and Technology**

Prof. Rohit Sinha (upto 12.07.2023)  
Dr. Sanasam Ranbir Singh (from 13.07.2023)

**Head, Centre for Career Development**

Dr. Lalit Mohan Pandey

**Head, Centre for Sustainable Polymers**

Dr. Amit Kumar

**Head, Centre for Sustainable Water Research**

Prof. Suresh A. Kartha

**Head, School of Agro and Rural  
Technology**

Prof. Sanjukta Patra (upto 30.04.2023)  
Prof. Ajay Kalamdhad (from 01.05.2023)

**Head, School of Business**

Prof. L. Boeing Singh (upto 13.02.2024)  
Prof. Sukhomay Pal (from 14.02.2024)

**Head, Mehta Family School of Data  
Science & AI**

Prof. Ratnajit Bhattacharjee

**Head, Jyoti and Bhupat Mehta  
School of Health Science & Technology**

Prof. Dipankar Bandopadhyay

**Head, School of Energy Science and  
Engineering**

Prof. Vaibhav V. Goud



## IIT COUNCIL

Minister in charge of Technical Education in the Central Government (Ex-Officio)	<b>Chairman</b>
Chairman of Board of Governors of all Indian Institutes of Technology (Ex-Officio)	<b>Member</b>
Director of all Indian Institutes of Technology (Ex-Officio)	<b>Member</b>
Chairman, University Grants Commission (Ex-Officio)	<b>Member</b>
Director General, Council of Scientific and Industrial Research (Ex-Officio)	<b>Member</b>
Chairman, Indian Institute of Science, Bangalore (Ex-Officio)	<b>Member</b>
Director, Indian Institute of Science (Ex-Officio)	<b>Member</b>
Three nominees of the Central Government	<b>Member</b>
To represent the Ministry concerned with Technical Education	<b>Member</b>
To represent the Ministry of Finance	<b>Member</b>
To represent any other Ministry	<b>Member</b>
Nominee of the All India Council for Technical Education (AICTE)	<b>Member</b>
Nominees of the Visitor (minimum 3 and maximum 5)	<b>Member</b>
Three Members of Parliament (two from Lok Sabha and one from Rajya Sabha)	<b>Member</b>
Secretary to the Council	<b>Secretary</b>

## BOARD OF GOVERNORS

**Dr. Rajiv I. Modi**

Chairman & Managing Director  
Cadila Pharmaceuticals Limited  
Cadila Corporation Campus,  
Sarkhej-Dholka Road, Bhat,  
Ahmedabad – 382 210, Gujarat

**Chairman**

**Dr. Prahlada Rama Rao**

Pro Chancellor S-VYASA , Director, Centre  
for Energy Research  
Former Distinguished Scientist & CC R&D  
DRDO  
Former Vice Chancellor, DIAT(DU), Pune.  
DRDO, Min of Defence  
Adjunct Faculty, Dept. of Management IISc  
and NIAS, Bengaluru. Member, IISc Court

**Member**

**Nominees of the IIT  
Council**

**Prof. S. K. Srivastav**

Vice Chancellor  
North Eastern Hill University  
Shillong – 793 022

**Member**

**Prof. Varadraj B. Bapat**

Faculty in Accounting and Finance  
SIM School of Management  
Indian Institute of Technology Bombay  
Powai, Mumbai – 400 076

**Member**

**Additional/ Joint Secretary (TE)**

Ministry of HRD, Shastri Bhawan  
New Delhi

**Member**

**Prof. Parameswar K. Iyer** (up to 06.11.2023)  
**Prof Rajeev Ahuja** (from 07.11.2023)

**Officiating  
Director**

**Member, ex-officio**

**Commissioner & Secretary to the Govt.  
of Assam**

Higher Education (Technical) Department  
Dispur, Guwahati – 781 006

**Member**

**Nominee from Govt. of  
Assam**



**Shri Neel Prakash Chhetri**  
Proprietor, SIBIN Group  
Gangtok, Sikkim-737 101

**Member**

**Nominee from North  
Eastern Region**

**Prof. Tamal Banerjee** (till 31.12.2023)  
Dept. of Chemical Engineering  
IIT Guwahati 781039

**Member**

**Nominees of the  
Senate**

**Prof. Mohammad Jawed**  
Department of Civil Engineering  
IIT Guwahati

**Member**

**Prof. M G P Prasad** (from 01.01.2024)  
Dept of Mathematics  
IIT Guwahati

**Member**

# SENATE

<b>The Director</b>	<b>Chairman (Ex-Officio)</b>
<b>The Deputy Director</b>	<b>Member (Ex- Officio)</b>
<b>All Professors of the Institute</b>	<b>Member</b>
Three persons, not being employees of the Institute, to be nominated by the Chairman, BOG In consultation with the Director, from among educationists of repute, one each from the fields of Sciences, Engineering and humanities	<b>Board Nominee</b>
<b>Head of the Academic Departments, Academic Centres and Academic Schools</b>	<b>Member</b>
<b>Librarian of the Institute</b>	<b>Member</b>
<b>Chairman, Hostel Affairs Board</b>	<b>Member</b>
<b>Registrar of the Institute</b>	<b>Secretary (Ex-Officio)</b>



## FINANCE COMMITTEE

**DR. RAJIV I. MODI**

Chairman & Managing Director  
Cadila Pharmaceuticals Limited  
Cadila Corporation Campus  
Sarkhej-Dhokla Road, Bhat  
Ahmedabad – 382210  
Gujarat

**Chairman**

**Prof. P. K. Iyer**

Officiating Director, IIT Guwahati  
Guwahati-781039

**Member**  
(Till 06.11.2023)

**Prof. Rajeev Ahuja**

Officiating Director, IIT Guwahati  
Guwahati-781039

**Member**  
(From 07.11.2023)

**DIRECTOR (IITs)**

Dept. of Higher Education  
MHRD, Shastri Bhawan  
New Delhi-110 115

**Member**

**DIRECTOR (FINANCE)**

Integrated Finance Division  
MHRD, DoHE  
IF-I Section, Shastri Bhawan  
New Delhi-110 115

**Member**

**PROF. GAUTAM BARUA**

Director, IIIT Guwahati  
IT Park Street Bongora  
Guwahati-781015

**Member**

**DR. BIREN DAS**

Registrar, Tezpur University, Napaam, Tezpur-784028

**Member**

**Prof. G. Krishnamoorthy**

Registrar  
Finance Committee  
IIT Guwahati  
Guwahati-781039

**Secretary**

## BUILDING & WORKS COMMITTEE

**The Director**  
IIT Guwahati

**Chairman (Ex-Officio)**

**The Deputy Director**  
IIT Guwahati

**Member (Ex-Officio)**

**All the Professors of the Institute**

**Member**

**Three persons, not being employees of the Institute, to be nominated by the Chairman, BOG, in consultation with the Director, from among educationists of repute, one each from the fields of Sciences, Engineering and Humanities**

**Board Nominee**

**The Head of the Academic Departments, Academic Centres and Academic Schools**

**Member**

**The Librarian of the Institute**

**Member**

**The Chairman, Hostel Affairs Board**

**Member**

**The Registrar**

**Secretary (Ex-Officio)**



## INTRODUCTION

The year 2023 saw IIT Guwahati's twenty fifth batch of students taking their degrees in the month of July. The Institute takes pride in the achievements of its students and gladly announces that almost all the graduated students have been well placed in various government organisations and multi-national companies in India and abroad. All the achievements in academic and research areas have been successful only because of the relentless efforts of dedicated faculty members, students and the commendable cooperation of all other non-teaching employees of the Institute.

Here is a brief report on the activities and achievements of the Institute during the year 2023-24.

## ACADEMIC ACTIVITIES

The Institute has 11 Academic Departments, 9 Inter-disciplinary Academic Centres, 5 Schools and 5 Extramural Centres. They are –

### Departments

Biosciences and Bioengineering (BSBE)  
Chemical Engineering (CL)  
Chemistry (CH)  
Civil Engineering (CE)  
Computer Science and Engineering (CSE)  
Design (DD)  
Electronics and Electrical Engineering (EEE)  
Humanities and Social Sciences (HSS)  
Mathematics (MA)  
Mechanical Engineering (ME)  
Physics (PH)

### Academic Centres

Centre for Disaster Management and Research  
Centre for Drone Technology  
Centre for the Environment  
Centre for Indian Knowledge Systems  
Centre for Intelligent Cyber Physical Systems  
Centre for Linguistic Science and Technology  
Centre for Nanotechnology  
Centre for Sustainable Polymers  
Centre for Sustainable Water Research

## Schools

School of Agro and Rural Technology

School of Business

Mehta Family School of Data Science and Artificial Intelligence

School of Energy Science and Engineering

School of Health Science & Technology

## Extramural Centres

Computer and Communication Centre

Central Instruments facility

Centre for Educational Technology

Centre for Career Development

Centre for Creativity

The Institute offers academic programmes covering a wide range of science, engineering and humanities disciplines as given below:

- Bachelor of Technology (BTech) Programmes in CSE, ECE, ME, CE, Biotechnology, CLE, EEE, EP, CST, MC
- Bachelor of Design (BDes) programme in Design (DD)
- Master of Technology (MTech) programmes in CSE, EEE, ME, CE, Biotechnology, Bioengineering, Chemical Engineering, Rural Technology, Robotics and Artificial Intelligence, Data Science, Food Science and Technology, Biomedical Science and Engineering
- Master of Design (MDes) programme in Design
- Master of Science by Research [MS(R)] programme in Energy Science and Engineering, Disaster Management and Risk Reduction, Polymer Science and Technology
- Master of Science (MSc) programmes in Physics, Chemistry, Mathematics and Computing
- Master of Arts (MA) programme in Development Studies, Liberal Arts
- Doctor of Philosophy (PhD) programmes in CSE, EEE, ME, CE, DES, BSBE, CLE, PHY, CHM, Mathematics, Energy Science & Engineering, ENV, HSS, ENV, NANO, Rural Technology, CLST, Disaster Management & Research, Business, Health Science & Technology, DS&AI, Indian Knowledge Systems, Linguistic Science & Technology, Sustainable Polymers, ICPS, Sustainable Water Research, Drone Technology
- Dual (MTech + PhD) programme in CSE, ME
- Dual [MS (Eng.) + PhD] programme in EEE
- Master of Business Administration

The academic session 2023-2024 commenced from July 2023. 2291 students were admitted in various programmes across all the Departments/Academic Centres/Schools during the reporting year. The department/centre/school-wise details of new admissions, excluding the preparatory students, are given in the table below:

<b>Department/Centre/School</b>	<b>BTech/ BDes</b>	<b>MSc/ MA</b>	<b>MTech/ MDes</b>	<b>MS(R)</b>	<b>PhD</b>	<b>Dual Degree</b>	<b>MBA</b>
Biosciences and Bioengineering (BSBE)	80	-	43	-	46	-	-
Chemical Engineering (CL)	96	-	47	-	17	-	-
Chemistry (CH)	-	59	-	-	67	-	-
Chemical Science & Technology (CT)	63	-	-	-	-	-	-
Civil Engineering (CE)	117	-	132	-	38	-	-
Computer Science and Engineering (CS)	113	-	66	-	8	1	-
Design (DD)	55	-	61	-	6	-	-
Electronics and Communication Engineering (EC)	105	-	-	-	-	-	-
Electronics and Electrical Engineering (EE)	61	-	82	-	31	3	-
Humanities and Social Sciences (HS)	-	54	-	-	11	-	-
Mathematics & Computing (MC)	71	60	-	-	12	-	-
Mechanical Engineering (ME)	118	-	124	-	21	-	-
Physics (PH)	67	55	-	-	45	-	-
Energy Science and Engineering (EN)	20	-	-	11	11	-	-
Environment (EV)	-	-	-	-	10	-	-
Nanotechnology (NT)	-	-	-	-	8	-	-
Agro and Rural Technology (RT)	-	-	6	-	8	-	-



Department/Centre/School	BTech/ BDes	MSc/ MA	MTech/ MDes	MS(R)	PhD	Dual Degree	MBA
Linguistic Science and Technology (LST)	-	-	-	-	3	-	-
Data Science (DS)	30	-	20	-	5	-	-
Food Science and Technology (FST)	-	-	8	-	-	-	-
E-Mobility (EM)	-	-	-	2	-	-	-
Intelligent Cyber Physical Systems (ICPS)	-	-	32	-	2	-	-
Disaster Management and Research (CDMR)	-	-	-	3	6	-	-
Indian Knowledge System (IKS)	-	-	-	-	2	-	-
Health Science and Technology (HST)	-	-	28	-	10	-	-
Bioengineering (BE)	-	-	9	-	-	-	-
Sustainable Polymer (SP)	-	-	-	1	6	-	-
Sustainable Water Research (SWR)	-	-	-	-	4	-	-
School of Business (SB)	-	-	-	-	8	-	23
Total	996	228	658	17	385	4	23

• **Preparatory: 3**

- B. Tech. in Electronics and Communication Engineering: 105, and B. Tech. in Electronics and Electrical Engineering: 61

## Twenty Fifth Convocation

In the Twenty Fifth Convocation, a total number of 2011 students received their BTech, BDes, MA, MSc, MTech, MDes and PhD degrees as given below:

Course	2023-24
BTech and BDes	816
MTech and MDes	659
MSc	157
MA	43
MS(R)	33
Dual Degree (MTech+PhD)	1
PhD	302
<b>Total</b>	<b>2011</b>

Programme	Nos.
BTech/BDes	816
Biotechnology	55
Chemical Engineering	74
Chemical Science and Technology	49
Civil Engineering	88
Computer Science and Engineering	111
Design	56
Electronics and Communication Engineering	103
Electronics and Electrical Engineering	65
Engineering Physics	39
Mathematics and Computing	67
Mechanical Engineering	109
<b>Total</b>	<b>816</b>

MSc	157
Chemistry	54
Mathematics and Computing	48
Physics	55
<b>Total</b>	<b>157</b>
MA	43
Development Studies	43
<b>Total</b>	<b>43</b>

MS(R)	<b>33</b>
Centre for Energy	15
E-Mobility	6
Disaster Management & Risk Reduction	7
<b>Total</b>	<b>33</b>

MTech/MDes	<b>659</b>
Biotechnology	50
Chemical Engineering	77
Design	29
Civil Engineering	143
Computer Science and Engineering	72
Electronics and Electrical Engineering	101
Mechanical Engineering	126
Rural Technology	13
Robotics & Artificial Intelligence	14
Data Science	26
Food Science and Technology	8
<b>Total</b>	<b>659</b>

## MoE-NIRF INDIA RANKINGS

IIT Guwahati has retained the 7<sup>th</sup> rank among the best engineering institutions of the country in the 'India Rankings 2023', also achieved the rank of 9<sup>th</sup> in the 'Overall' category and 9<sup>th</sup> position in 'Research Institutions' category in this year (2023) declared by National Institutional Ranking Framework (NIRF) of the Union ministry of Human Resource Development (HRD).

PhD**	<b>303</b>
Biotechnology	31
Chemical Engineering	35
Civil Engineering	32
Computer Science and Engineering	13
Design	16
Electronics and Communication Engineering	29
Humanities & Social Sciences	11
Physics	26
Mathematics and Computing	11
Mechanical Engineering	34
School of Energy Science & Engineering	5
Centre for the Environment	18
Centre for Nanotechnology	4
Centre for Linguistic Science & Technology	2
<b>Total</b>	<b>303</b>

## QS RANKING

In the recently announced QS Ranking 2024 IIT Guwahati has secured 32<sup>nd</sup> rank globally (37<sup>th</sup> in 2023) in the 'Research Citations per Faculty' category. The Institute has gained rank =364 in World University Ranking globally.

## TIMES HIGHER EDUCATION "THE" IMPACT GLOBAL RANKING 2023

### Top 100 Globally

SDG 7 Affordable and Clean Energy (6<sup>th</sup>)

### Top 200 Globally (First time IITG has been ranked)

SDG 9 Industry, Innovation and Infrastructure

### Top 200 Globally

SDG 8 Decent Work and Economic Growth

SDG 14 Life Below Water

SDG 15 Life on Land

### Top 400 Globally

SDG 2 Zero Hunger

SDG 6 Clean Water and Sanitation

## SWACHHTA RANKING

IIT Guwahati was ranked Third in the category of 'Residential University - AICTE' in the third edition of annual 'Swachh Campus Ranking 2019' for higher educational institutions organised by HRD ministry.

## RESEARCH AND DEVELOPMENT

The other component of our research program is sponsored (or directed) research. As on 31.03.2014, there are a total of 331 research projects in progress with a total sanctioned value of about Rs. 235.00 crore. Out of the total 331 ongoing projects, 127 projects are new received during the financial year 2023-2024 having a sanctioned value of Rs. 92.82 crore. The R&D projects are mainly sponsored by Government Ministries and Departments with major support coming from the Department of Higher Education (DHE), the Departments of Science and Technology (DST) and Biotechnology (DBT), the Science and Engineering Research Board (SERB), the Board of Research in Nuclear Sciences (BRNS), the Defence Research and Development Organisation (DRDO), and the Indian Council of Medical Research (ICMR). We also have a considerable number of industry-supported research projects. There are about 220 Principal Investigators involved in carrying out the research work of the Institute.

It is noteworthy to mention that the research dimension of IIT Guwahati is broadening significantly and the same is now reflected in terms of multiple Industrially funded collaborative research with close cooperation with Industry partners. Both private and government funded companies have funded various sponsored research projects to IIT Guwahati. These companies include, TATA Steel, ONGC, North East Electrical Power Corporation., Indian Space Research Organization, Purple Patch Services (an International company), Elint Technologies, HPCL Green, Agriculture and Rural Development Bank, National Rural Infrastructure Development Agency, Numaligarh Refinery Limited, OIL, INAE, BORDOLOI BIOTECH INDIA PRIVATE LIMITED, Central Mine Planning & Design Institute Limited (CMPDI), Ekaterra Research and Development India Private Limited, NTPC etc.



## **INDUSTRIAL INTERACTIONS AND SPECIAL INITIATIVES**

The office of the Dean, Industrial Interactions and Special Initiatives (II&SI), has been established at IIT Guwahati to fulfil the twin objectives of enriching the research infrastructure and enhancing the interaction and collaboration with industry exclusively. II&SI encourages both consultancy and research from industry. The main functions of the office include administrative and accounts support for fully/partially industry funded projects and consultancy, short term courses and other programs for and from industry, projects and activities related to Entrepreneurship, Start-up company, etc., projects/programs with Honorarium/Chair-Professorship, MoU/MoA with industries and funding agencies, technology transfer, Intellectual Property Rights (IPR) cell, Institute affairs related to IIT Guwahati Research Park and other companies of the Institute and IIT Guwahati Technology Incubation Centre (TIC) and other societies of the Institute.

**Transfer of Technology:**

During the period under consideration, total 04 numbers of technology transfer has been registered.

Sl. No.	Department	Name of Technology	Principal Inventor
01	Chemical Engg.	System for installation of water quality sensor at bypass line	Prof. Senthilmurugan S.
02	Chemical Engg.	Low cost energy system to produce bichar from biomass	Prof. Senthilmurugan S.
03	Chemical Engg.	Sensor fabrication, device design and test protocol method optimization	Prof. Dipankar Bandyopadhyay
04	Chemical Engg.	Biobased adhesive formulation for structural application (980/KOL/2015), Poly(lactic acid) Nanocomposites formulation and method of making thereof ( 982/KOL/2015), Formulation of Heat stable stereocomplex Poly (Lactic Acid) Composite( 353775), Formulation of Polymer Nicotine Conjugates (48663),Stereocomplex Terpolymers and Composites of PLA and PCL, and a method of preparation thereof (428330),Process for preparation of Nano-chitosan Aided Starch and Guar Gum Biocomposites Based Edible Packaging Material(429655),Dispersible Biobased Additive Formulation for Biodegradable Polymer Packaging(981/KOL/2015),Metal Free Prodigious catalyst for lactic polymerization (419571),Polymer Composite Membrane for Water Purification(388901),PLA-R-PCL BASED SHAPE MEMORY, ELASTOMERIC COMPOSITES AND METHOD OF PREPARATION THEREOF(432821)	Prof. Vimal Katiyar

**Indian Patent (Granted):**

Sl. No.	Patent Title	Inventor's Name	Patent No.	Date of Grant
1	STEREOCOMPLEX TERPOLYMERS AND COMPOSITES OF PLA AND PCL, AND A METHOD OF PREPARATION THEREOF	Dr. Vimal Katiyar, Ms. Neha Manojkumar Mulchandani, Prof. Yoshiharu Kimura, Prof. Shinichi Sakurai, Dr. Kazunari Masutani	428330	05-04-2023
2	A POINT-OF-CARE HAND TREMOR DETECTION SYSTEM	BANDYOPADHYAY, Dipankar; KUMAR , Sunny; BHATTACHARJEE, Mitradip	429344	19-04-2023



3	PROCESS FOR PREPARING NANOCHITOSAN AIDED STARCH AND GUAR GUM BIOCOMPOSITES BASED EDIBLE PACKAGING MATERIAL	Dr. Vimal Katiyar, Ms. Tabli Ghosh	429655	21-04-2023
4	A free space optical communication system, apparatus, and method thereof	Bosanta Ranjan Boruah	JP,7263453,B	25-04-2023
5	SELF-ASPIRATED CLUSTERED POROUS RADIANT BURNER STOVE FOR CLEAN AND EFFICIENT LARGE-SCALE COMMERCIAL COOKING APPLICATIONS.	Dr. P. Muthukumar Sunita Deb	430032	26-04-2023
6	ALUMINA BASED DEEP EUTECTIC SOLVENT COMPRISING BENZOPHENONE AND BIPHENYL AS HEAT TRANSFER MEDIA	Prof.Tamal BanerjeeDr. Pyarimohan Dehury	430369	27-04-2023
7	INJECTION MOULDABLE POLYMERIC COMPOSITE BASED PASSIVE POLYCENTRIC KNEE JOINT	S. Kanagaraj, S. Arun	431546	11-05-2023
8	AN APPARATUS FOR ANALYSING BREAKDOWN AND PRE-BREAKDOWN PHENOMENA IN LIQUID-DIELECTRICS	Nayak Sisir Kumar, Ambuj Kumar, Baruah Niharika, Kanumuri Deepak	432202	18-05-2023
9	PLA-R-PCL BASED SHAPE MEMORY, ELASTOMERIC COMPOSITES AND METHOD OF PREPARATION THEREOF	Dr. Vimal KatiyarMs. Neha Manojkumar MulchandaniProf. Yoshiharu KimuraProf. Shinichi SakuraiDr. Kazunari Masutani	432821	25-05-2023
10	SYSTEM FOR SIMULTANEOUS WIRELESS INFORMATION AND ENERGY TRANSFER IN	RATNAJIT BHATTACHARJEE SALIL KASHYAPARIJIT ROY	433737	05-06-2023

	A HETEROGENEOUS NETWORK AND METHOD THEREOF			
11	AN ELECTRIC FIELD ENHANCEMENT SYSTEM FOR AUTOMATED MOBILE VEHICLE CHARGING	Kulkarni Shashank SatishAmarnath KumarSanghai Niraja PravinLambor Anurag RamraoNayak Sisir KumarD. Senthil Kumar	433790	06-06-2023
12	SPONTANEOUSLY SELF-ASSEMBLED NANOSHEETS FOR THE DETECTION OF ORGANIC VOLATILE CONTAMINANTS IN WATER	IYER, Parameswar Krishnan; MEHER, Niranjan	434268	09-06-2023
13	LPG-OPERATED FUEL-EFFICIENT AND CLEAN POROUS RADIANT BURNER	P. MUTHUKUMARM. ARUN KUMARV. R. NEELA	434432	13-06-2023
14	A SYSTEM AND METHOD FOR TREATING WASTE BIOMASS AND PLASTICS TO PRODUCE TRANSPORTABLE LIQUID-FUEL	Prabu Vairakannu Shekhar Jyoti Pathak	437189	04-07-2023
15	A PLANAR META-SURFACE SUB-REFLECTOR-BASED CASSEGRAIN REFLECTOR SYSTEM FOR TRANSFERRING AND HARVESTING OF POWER AND ENERGY	D. Senthil Kumar, Nayak Sisir Kumar, Lambor Anurag Ramrao, Amarnath Kumar, Kulkarni Shashank Satish	437297	05-07-2023
16	TITLE OF THE INVENTION: A THERAPEUTIC PAD SYSTEM TO STREAMLINE ARTERIAL BLOOD FLOW AND FACILITATE OXYGENATION DE-OXYGENATION OF BLOOD AND THEREOF	BANDYOPADHYAY, DipankarPAUL, PrasfuturaBHATTACHARJEE, Mitradiip	437567	06-07-2023

17	BIOGAS OPERATED DOMESTIC COOK STOVE WITH NATURALLY ASPIRATED POROUS RADIANT BURNER	Dr. P. Muthukumar Lav Kumar Kaushik ;Sangjukta Devi ;Arun Kumar M	437518	06-07-2023
18	HYDROGEN BONDING MEDIATED METHOD FOR THE ULTRADETECTION OF NERVE GAS VAPORS USING AMINE FUNCTIONALIZED CONJUGATED POLYMER BASED ELECTRICAL SENSOR	IYER, Parameswar KrishnanZEHRA , NehalKALITA , AnamikaMALIK , Akhtar Hussain	439495	19-07-2023
19	A GRAVITY-BASED, GAS-FREE, AND OMNIDIRECTIONAL LASER POWDER CLADDING HEAD	MANAS DAS, SAJAN KAPIL, AMBRISH SINGH	440581	26-07-2023
20	SYNTHESIS AND PROCESSING OF ST SPUTTERING TARGET MATERIAL TO OBTAIN SINGLE PHASE THIN FILMS	Dr. Pamu, D.; Rabha, Susmita; Das, Apurba	440751	27-07-2023
21	RECOMBINANT BACILLUS MEGATERIUM FOR PRODUCTION OF HEPARIN PRECURSORS	SIVAPRAKASAM, Senthilkumar; NEHRU, Ganesh; TADI, Subbi Rami Reddy	442402	02-08-2023
22	ERGONOMIC FLOATING DEVICE	KARMAKAR, Sougata CHAUHAN, JiteshSINGH, Gurdeep SinghSINGH, Hijam Jiten	443590	08-08-2023
23	ACOUSTIC DIAGNOSTIC POINT-OF-CARE TESTING DEVICE FOR BLOOD UREA DETECTION	BANDYOPADHYAY, DipankarTHAKUR , SiddharthBHATTACHARJEE , Mitradiip	443947	09-08-2023
24	A SYSTEM FOR EVALUATING NOVELTY OF CREATIVE WRITE-UP	DEBAYAN DHAR, PRADEEP G. YAMMIYAVAR, NANDITA BHANJA CHAUDHURI	445752	18-08-2023
25	POINT-OF-CARE DETECTION OF ETHANOL IN HUMAN BREATH AND OTHER ANALYTES.	MANDAL, Tapas K.NEMADE, Harshal B.BANDYOPADHYAY, DipankarMITRA, ShirsenduROY, Nirmal	446162	21-08-2023

26	METHODS FOR THE INCREASED PRODUCTION OF D (-) PANTOTHENATE IN BACILLUS MEGATERIUM	SIVAPRAKASAM, Senthilkumar; NEHRU, Ganesh; TADI, Subbi Rami Reddy	446398	22-08-2023
27	A PROCESS OF PREPARING AN ANTIVIRAL NANO FABRIC AND AN ANTIVIRAL NANO FABRIC THEREOF	Dr. Vimal KatiyarMs. Doli HazarikaDr. Amit Kumar Dr. Sachin Kumar	446951	24-08-2023
28	A POINT-OF-CARE SYSTEM FOR DETECTION OF THE PHYSICAL STRESS AT DIFFERENT PARTS OF BODY	BANDYOPADHYAY, Dipankar MIDDYA , Sagnik BHATTACHARJEE , Mitradip	447114	24-08-2023
29	APPARATUS AND METHOD FOR ENHANCED PRODUCTION OF METHANOL	DAS, Debasish; SINHA, Ankan; SAHOO, Krishna Kalyani	447607	28-08-2023
30	POLYCENTRIC KNEE JOINT WITH SWITCHABLE ASSISTED DEEP SQUAT HINGE	Subramani Kanagaraj, Kishore Kumar Padi	447610	28-08-2023
31	RESORBABLE CORTICAL SCREW	KATIYAR VIMAL, PRASAD ARBINDRAVI, SANKAR MAMILLA	449153	01-09-2023
32	IMPROVED CULTURE MEDIA FOR BUTANOL SYNTHESIS USING CLOSTRIDIUM ACETOBUTYLICUM ATCC 824	DAS, DebasishGOSWAMI, GargiKAUSHAL, MehakAHLAWAT, SaumyaMUKHERJEE, Mayurketan	450191	08-09-2023
33	PROCESS FOR REMOVAL OF CHROMIUM FROM LINZ-DONAWITZ SLAG	DR. MIHIR KUMAR PURKAIT , DEEPTI	452334	18-09-2023
34	AN ABSORBENT FOR REMEDIATION OF OIL SPILLS	MANNA, UttamNandakumar VKarthick RMAJI, KousikSHOME, ArpitaRATHER, Adil M	454888	26-09-2023
35	PA6/RGO/PANI TERNARY NANOCOMPOSITES AND FABRICATION OF SYMMETRIC SUPERCAPACITORS FOR	DASMAHAPATRA , Ashok KumarPALSANIYA , ShatrudhanNEMADE, Harshal B.	455624	29-09-2023

	ELECTROCHEMICAL ENERGY STORAGE APPLICATIONS			
36	APPARATUS AND METHOD FOR SCREENING OF GYNECOLOGICAL CONDITIONS OF A SUBJECT BODY	Debayan Dhar, Neelarnab Dutta	457400	09-10-2023
37	ELECTROCHEMICAL SENSOR AND MICRO-ELECTRO-MECHANICAL-SYSTEM (MEMS) FOR THE REAL-TIME POINT-OF-CARE-TESTING (POCT) OF THE CLINICALLY IMPORTANT BIOMARKERS IN THE BIOLOGICAL FLUIDS	BANDYOPADHYAY, DipankarMANDAL, Nilanjan	457604	09-10-2023
38	A PASSIVE DROPLET FORMATION AND SPLITTING MICROFLUIDIC DEVICE FOR SYMMETRIC OR ASYMMETRIC DROPLET GENERATION AND A PROCESS THEREOF.	Pranab Kumar MondalWankawala Dhruvkumar HarishchandraSudip Shyam	457943	10-10-2023
39	METHOD FOR PRODUCTION OF BIOFUELS BY FERMENTATION OF A SUGAR BEARING NUTRIENT MEDIA	DAS, DebasishGOSWAMI, GargiAHLAWAT, SaumyaKAUSHAL, Mehak	460664	19-10-2023
40	A MICROFLUIDIC DEVICE FOR THE POC DETECTION OF OLEOPHILIC BIOMARKERS IN HYDROPHILIC ANALYTES	BANDYOPADHYAY, DipankarGHOSHAL, TanushreeMIDDYA, Sagnik	461391	23-10-2023
41	CONVERSION OF GLYCEROL TO LACTIC ACID	Dr. Nageswara Rao PeelaProf. Ramgopal V. S. UppaluriMr. Hanumanth Reddy PemmanaMr. Ramu Reddi	466319	06-11-2023

42	HEXADENTATE CHELATE-BASED CONTRAST AGENT AND A METHOD FOR PRODUCING THE SAME	CHANDAN MUKHERJEE MAHMUDA KHANNAM	466441	07-11-2023
43	SELF-ASPIRATED PRESSURIZED KEROSENE COOKING STOVE WITH A POROUS RADIANT BURNER.	MAHANTA, Dr. Pinakeshwar MUTHUKUMAR, Dr. Palanisamy SINHA, Gyan Sagar MISHRA, Niraj SHARMA, Dr (Mrs). Monikankana MISHRA, Dr. Subhash Chandra	467774	09-11-2023
44	MAGNETIC NANOCOMPOSITE POLYMERIC MEMBRANE FOR PURIFICATION OF WATER AND PROCESS OF PREPARATION THEREOF	Prof. Vimal Katiyar Pankaj Boruah Raghvendra Gupta	467589	09-11-2023
45	PROCESS FOR PREPARATION OF HIGH SURFACE AREA ACTIVATED CARBON BY USING WASTE TEA LEAVES	Dr. Mihir Kumar Purkait Mr. Somnath Chanda Dr. Piyal Mondal	472466	23-11-2023
46	TRANSFORMATION OF FLY ASH INTO NON-TOXIC, HIGH WATER ABSORBING POLYMER FOR DROUGHT MANAGEMENT	SEKHARAN, Dr. Sreedeeep; MANNA, Dr. Uttam; SAHA, Abhisekh	473902	28-11-2023
47	Phosphine-Free NNN pincer-group (VIII) metal catalysts (M=Fe, Ru, Os) and process for alkylation of alcohols and biofuel production	AKSHAI KUMAR ALAPE SEETHARAMKANU DAS	477312	06-12-2023
48	TERNARY COMPOSITES COMPRISING HIERARCHICAL NANOSTRUCTURES AND SYSTEM THEREOF	DASMAHAPATRA, Ashok Kumar PALSANIYA, Shatrudhan NEMADE, Harshal B.	482884	14-12-2023
49	FET based sensing system for in-vitro electrochemical detection and quantification of GSH and a method for	Prof. Siddhartha Sankar Ghosh Prof. P. Paily Roy Ujjwol Barman	483147	15-12-2023



	fabricating such FET device			
50	AUTOCLAVED AERATED CONCRETE(AAC) BLOCK UNIT COMPRISING IN BUILT ANCHORAGE/FROG ON SURFACE FOR ENHANCEMENT OF BONDING AND LATERAL/SHEAR STRENGTH IN MASONRY WALL SYSTEM	DIXIT, Dr. Uday ShankerBORSAIKIA , Dr.Arun ChandraRAJ, Amit	483303	15-12-2023
51	A POINT-OF-CARE PIEZO-SENSOR TO DETECT REST TREMORS OF HUMAN LIMB	Dipankar BandyopadhyayPrathu Raja Paramar;Tanusree GhoshalNeeti Yadav;Uttariyo SahaSurjendu Maity;	485652	19-12-2023
52	FORMULATION OF POLYMER NICOTINE CONJUGATES	KATIYAR VIMALMILI MEDHAGUPTA ARVIND	486632	21-12-2023
53	PASSIVE POLYCENTRIC KNEE JOINT	Subramani KanagarajVaibhav Jaiswal	490011	27-12-2023
54	FREE SPACE OPTICAL COMMUNICATION SYSTEM APPARATUS AND A METHOD THEREOF	BORUAH, Bosanta RanjanKONWAR, Santanu	491998	29-12-2023
55	UNIPOLAR COIL ARRANGEMENT METHOD FOR IMPROVING THE COUPLING FACTOR AND REDUCING THE ELECTROMAGNETIC EMISSIONS IN WIRELESS POWER TRANSFER SYSTEMS AND A COIL THEREOF	PRAVEEN KUMARGAUTAM RITURAJ	497323	10-01-2024

56	NANOFUEL OPERATED SELF-ASPIRATED PRESSURIZED KEROSENE COOKING STOVE WITH A POROUS RADIANT BURNER	Dr. KANAGARAJ SUBRAMANIDr. SHANMUGA PRIYA NATESANDr. (Mrs). MONIKANKANA SHARMA Mr. LAV KUMAR KAUSHIKMr. GYAN SAGAR SINHADr. MUTHUKUMAR PALANISAMY	497095	10-01-2024
57	A METHOD FOR CARRYING OUT IMAGE DEPENDENT ANALYTICS BASED ON IMAGES OR FRAMES OF MOTION PICTURES AND A SYSTEM THEREOF	BANDYOPADHYAY , DipankarBHATTACHARJEE , Mitradip	498814	12-01-2024
58	RESORBABLE POLYMER COMPOSITE BONE PLATE	KATIYAR VIMALPRASAD ARBINDRAVI SANKAR MAMILLA	500905	18-01-2024
59	A DEVICE FOR PUDAM PROCESS	SELVARAJ SENTHILVELAN ( A S GANESH KUMAR )	502091	23-01-2024
60	A COMPOSITION FOR FILTRATION OF MICROORGANISM AND HEAVY METALS AND A PROCESS THEREOF	CHATTOPADHYAY, ArunGHOSH, Siddhartha, SankarDAS, MadhumitaGOSWAMI, Upashi	503202	24-01-2024
61	NON-INTRUSIVE AND NON-DESTRUCTIVE SYSTEM AND METHOD FOR CONDITION ASSESSMENT OF TRANSFORMER LIQUID INSULATION	Sisir Kumar NayakShashank Satish KulkarniRohith Sangineni	503817	27-01-2024
62	LOW TEMPERATE MICROWAVE SINTERED PHASE PURE ALN CERAMICS COMPRISING RARE EARTH OXIDE ADDITIVES	Dr. Pamu, DDr Tiwari, T.Ms. Radhika, E.	505981	31-01-2024
63	FRANGIBLE STRUCTURES FOR AVIATION INDUSTRY	SHARMA, HrishikeshKUMAR, SumanSHARMA, A.KGARIYA, D. S.	505446	31-01-2024

64	A SYSTEM FOR MODIFIED THERMO-CHEMICAL CONVERSION OF WASTE BIOMASS TO STABILIZED BIOFUELS AND SYNTHESIS GASES	KISHORE, NandaKAWALE, Harshal Dnyandeo	526948	15-03-2024
65	A process for extraction and purification of phycocyanin from spirulina biomass	Debasish Das, Krishna Kalyani Sahoo, Ankan Sinha	515016	26-02-2024
66	A DEVICE FOR PUDAM PROCESS	SELVARAJ SENTHILVELAN, A S GANESH KUMAR	502091	23-01-2024
67	A SELF-POWERED STRAIGHT COCHLEA BASILAR MEMBRANE SET TO REPLACE THE FUNCTION OF DAMAGED INNER EAR	SUBRAMANI KANAGARARAGDEEP RAJAPARNA ZAGABATHUNI	518487	01-03-2024
68	PRODUCTION OF LEVULINIC ACID FROM FURFURAL AND/OR XYLOSE FEEDSTOCKS	Dr. Nageswara Rao Peela, Mr. Bharath Velaga	513998	22-02-2024
69	HYBRID BUCKLING RESTRAINED BRACE WITH HIGH DAMPING CAPACITY AND MANUFACTURING METHOD THEREOF	Prof. Sajal Kanti Deb, Mr. Pallab Jyoti Das	508542	08-02-2024
70	BISTABLE COMPLIANT GRIPPER FOR PIPE CLIMBING ROBOT	SANTOSHA KUMAR DWIVEDY, BASIREDDY SANDEEP REDDY, LATE ANNEM NARAYANA REDDY, SAURAV KUMAR DUTTA	529531	21-03-2024
71	HYDROXYAPATITE (HAP) COMPRISING OF MIXED POLYMORPHS OF MONOCLINIC AND HEXAGONAL PHASES OBTAINED BY SOL-GEL PROCESS	Dr. Pamu, D.; Das, Apurba	507092	05-02-2024
72	LOW TEMPERATE MICROWAVE SINTERED PHASE PURE ALN CERAMICS COMPRISING RARE EARTH OXIDE ADDITIVES	Dr. Pamu, D.; Ms. Radhika, E.; Dr Tiwari, T.	505981	31-01-2024

73	ENERGY EFFICIENT AND ECO-FRIENDLY DOMESTIC LPG COOKING STOVE WITH A TWO-LAYER POROUS RADIANT BURNER	Dr. P. Muthukumar, Lav Kumar Kaushik	526458	14-03-2024
74	BEAT TO BEAT IN-SITU BLOOD PRESSURE MONITORING SYSTEM FOR CARDIOVASCULAR IMPLANTABLE ELECTRONIC DEVICES	Heta Jigar Panchal Kishore Kumar Padi Ajaikumar B. Kunnumakkara Subramani Kanagaraj	506626	02-02-2024
75	SYSTEM AND METHOD FOR PRODUCING SERICIN COATED MEMBRANES	Senthilmurugan SubbiahVishal Kumar VermaDr. Sankar S K	518270	01-03-2024
76	PORTABLE AND MODULAR POCT DEVICE FOR RAPID MULTIPLE DIAGNOSTIC TESTS	CHOWDHURY, ANKIT; MANDAL, NILANJAN; BHATTACHARJEE, MITRADIP; JAGNANI, SAHIL; UPADHYAY, PANKAJ; BANDYOPADHYAY, DIPANKAR	507439	06-02-2024
77	UNIPOLAR COIL ARRANGEMENT MEETHOD FOR IMPROVING THE COUPLING FACTOR AND REDUCING THE ELECTROMAGNETIC EMISSIONS IN WIRELESS POWER TRANSFER SYSTEMS AND A COIL THEREOF	GAUTAM RITURAJ; PRAVEEN KUMAR	497323	10-01-2024
78	AN UNDERWATER VEHICLE	AVILASH SAHOO, Santosha Kumar Dwivedy, PUTHUVEETIL SREEDHARAN ROBI	528483	15-03-2024
79	AGGREGATION INDUCED EMISSION AND CRYSTAL INDUCED MECHANOCROMISM OF MONO-SUBSTITUTED DIBENZOFULVENE DERIVATIVES	PARAMESWAR KRISHNAN IYER P. GOPIKRISHNA	506230	01-02-2024

80	BAMBOO FOR CONSTRUCTION OF FRANGIBLE STRUCTURES FOR AVIATION INDUSTRY	Hrishikesh SHARMA, Suman KUMAR, A.K. SHARMA, D. S. GARIYA	505446	31-01-2024
81	DEVELOPMENT OF WELL PRESERVED, SUBSTRATE-VERSATILE LATENT FINGERPRINTS AND A METHOD FOR ITS VISUALIZATION UTILIZING AGGREGATION INDUCED ENHANCED EMISSION ACTIVE CONJUGATED POLYELECTROLYTE	Akhtar Hussain Malik Parameswar Krishnan Iyer Anamika Kalita	525835	14-03-2024
82	HYDRAZINE DETECTOR DEVICE COMPRISING OF FLUORESCENT ORGANIC MOLECULAR PROBE	Parameswar Krishnan Iyer Niranjan MEHER	525172	14-03-2024
83	A COMPOSITION FOR FILTRATION OF MICROORGANISM AND HEAVY METALS AND A PROCESS THERE	CHATTOPADHYAY, ArunGHOSH, Siddhartha, SankarDAS, MadhumitaGOSWAMI, Upashi	503202	24-01-2024
84	SYSTEM AND METHOD FOR PRODUCING SERICIN COATED MEMBERS	Senthilmurugan Subbiah, Vishal Kumar Verma	510021	13-02-2024
85	RESORBABLE POLYMER COMPOSITE BONE PLATE	KATIYAR VIMAL PRASAD ARBIND(bihar) RAVI SANKAR MAMILLA	500905	18-01-2024
86	A METHOD FOR CARRYING OUT IMAGE DEPENDENT ANALYTICS BASED ON IMAGES OR FRAMES OF MOTION PICTURES AND A SYSTEM THEREOF	BANDYOPADHYAY , Dipankar; BHATTACHARJEE , Mitradiip	498814	12-01-2024

87	NANOFUEL OPERATED SELF-ASPIRATED PRESSURIZED KEROSENE COOKING STOVE WITH A POROUS RADIANT BURNER.	Dr. MUTHUKUMAR PALANISAMY, Mr. GYAN SAGAR SINHA, Mr. LAV KUMAR KAUSHIK, Dr. (Mrs). MONIKANKANA SHARMA, Dr. SHANMUGA PRIYA NATESAN, Dr. KANAGARAJ SUBRAMANI	497095	10-01-2024
88	WIRELESSLY OPERATED LED DEVICE FOR PHOTODYNAMIC THERAPY AND SUBSEQUENT MONITORING OF THERAPEUTIC SUCCESS	CHATTOPADHYAY, Arun SAILAPU, Sunil, Kumar DUTTA, Deepanjalee GHOSH, Siddhartha, Sankar SIMON, Anitha, T.	522671	09-03-2024
89	A METHOD FOR DETERMINATION OF HEAT CHANGE IN A FLUID SAMPLE	NARESH MOHAN SENTHILKUMAR SIVAPRAKASAM RAJ SHANKARAMURTHY	515581	27-02-2024

**PATENT PUBLICATION:**

During the period under report a total of 27 patents were published.

**IPR POLICY:**

To create awareness and encourage the faculty members about IPR, workshops are organized from time to time. The Institute provides financial support up to Rs.2,00,000/- per annum per faculty member as reimbursement towards patent filing charges. An Intellectual Property Rights (IPR) cell under the Dean, II&SI with Faculty Coordinator-1 and Faculty Coordinator-2 take care of IPR related matters.

**CONSULTANCY:**

During the period under report, the Institute registered 329 Consultancy projects and received an amount of ₹28.44 crores (approx.).

**SPONSORED RESEARCH:**

17 numbers of new Sponsored Research projects were registered with II&SI office during 2023-24.



**MoU and MoA:**

A total number of 36 MoU and MoA-s were signed during the year under report. The following table shows the detail of the signed MoU & MoA:

<b>Sl No.</b>	<b>Year</b>	<b>Mou/MoA details</b>	<b>Initiated by (Department/Centre/School)</b>
1	2023	MoU between Transport Dept. & IITG	Dr. Akhilesh Kumar Maurya, CE
2	2023	Research Agreement between TATA Steel and IITG	Dr. Swarup Bag, ME
3	2023	MoU between IITG and Border Security Forces (BSF)	Dr. Roy Paily P., EEE
4	2023	Contract Agreement between IITG and Aravali Power Company Pvt. Ltd.	Dr. Amit Shelke, CE
5	2023	MoU between Guwahati Smart City Limited and IIT Guwahati	Dr. Chayan Bhawal EEE, Dr. Roy Paily P. EEE
6	2023	MOU between IITG and BIOBAANS CARBONS LLP	Dr. V. V. GOUD, CLE
7	2023	MoU Between IITG and Rhino Tech Waste Foundation	Dr Nanda Kishore, CLE
8	2023	MoU between Wilburg Living Solutions and IITG	Dr. Supradip Das, DD
9	2023	MoU between ARAI (Automotive Research Association of India and IITG	Prof. P.K. Iyer, CHE, G. Krishnamoorthy CHE
10	2023	MoU between Genstru Consultants Pvt. Ltd. and IIT Guwahati	Dr. S. Sekharan, CE
11	2023	Research Agreement between Loughbrough University and IITG	Dr. Poonam Kumari, ME
12	2023	MoU between Bharat Biotech International Limited and IITG	Dr. Sachin Kumar, BSBE`
13	2023	MOA between NRL & IITG	Prof. Senthilmurugan S., CLE
14	2023	Grant Agreement between Intel and IITG	Dr. Gaurav Trivedi, EEE
15	2023	Mou Between AMTRON, I-Sec Security Services Pvt. Ltd. and IIT Guwahati	Director office
16	2023	MoU between Danazir Wealth Management Pvt. Ltd. and IIT Guwahati	Director office
17	2023	MOU between 134 Infantry Battalion (TA) ECO Assam	Dr. Siddhartha Singha, SART

18	2023	MoU between Water Resource Department Odisha and IIT Guwahati	Prof. Subashisa Dutta, CE
19	2023	MoU between Guwahati Smart City Limited and IIT Guwahati	Dr. Chyan Bhowal, EEE
20	2023	MOU between PWD ( NH Works) Govt of Assam and IITG	unknown
21	2024	UNILEVER INDUSTRIES PVT LTD AND IITG	Prof. Senthilmurugan S., CLE
22	2024	MoU Between OIL India Limited and IITG signed on 21.06.2023	Dr. Kalyan Raidongia, CHE
23	2024	MOU between GIZ GMBH and IIT Guwahati	Prof. Arup Kumar Sarma, CE
24	2024	ASSTC and IITG agreed to collaborate and support each other to promote training of ASSTC officers in conducting courses related to drone operation, training, maintenance, data collection, application in various sectors. MoU Between IIT Guwahati and	Prof. P.K. Iyer, Dean PRBR
25	2024	MoU between Project Director, Assam society for comprehensive Financial Management system (AS-CFMS) AND IITG	Dr. Keyur Sorathia, DD
26	2024	Mou between District Commissioner Chirang and IITG	Prof. Rajib Bhatarcharjya,
27	2024	MoA between directorate (training) Directorate General Resettlement, Ministry of defence and IITG	Director office
28	2024	MoU between Eli Lilly Service and IITG	Dr. Amit Awekar, CSE
29	2024	MoU between M/s Invitreo Biosciences and IITG	Prof. S. Kanagaraj, ME
30	2024	MoU between Bio Trend Energy and IITG	Dr. Siddhartha Singha, SART
31	2024	MoU between India HUB e-governance , Srikishan Sarada College and IITG	Dr. Siddhartha Singha, SART
32	2024	MoU between We farm pvt ltd, USTM and IITG	Dr. Siddhartha Singha, SART
33	2024	MoU between Healthium Medtech and IITG	Dr. Keyur Sorathia, DD

34	2024	Healthium Medtech Ltd and IITG	Dr. Keyur Sorathia, DD
35	2024	North East Centre for Technology Application & Reach (NECTAR) and IITG	Prof. S. K. Kakoty
36	2024	Chief Engineer (Airforce) ShillongG Zone	Prof. Teiborlang Lyngdoh Ryntathiang,CE

## 1. MAJOR EVENTS ORGANIZED BY INDUSTRIAL INTERACTIONS AND SPECIAL INITIATIVES

### RESEARCH & INDUSTRIAL CONCLAVE INTEGRATION 2023 (14 – 16 May 2023)

#### OVERVIEW

Research & Industrial Conclave-INTEGRATION 2023 is the flagship event of IIT Guwahati jointly organized by IIT Guwahati Students' Academic Board and IIT Guwahati Research Park.

This is the second version of its kind organized during 14<sup>th</sup> – 16<sup>th</sup> May, 2023 aiming to:

- Showcase the ongoing research activities of research group from different institutions across the country
- Connecting industry and academia to exchange their problems and solutions
- Providing a platform for students, innovators, entrepreneurs to showcase concepts and ideas to investors and industries
- Inspiring and encouraging young minds towards research and innovation

#### Invited Speakers:

- Prof. Subhash Kak: Padma Shri, Professor, Department of Computer Science, Oklahoma State University
- Dr. Binoy K Saikia: Principal Scientist, CSIR-North East Institute of Science & Technology
- Dr. Rubul Mout: Research Fellow, Harvard Medical School, Harvard University, Stem Cell Program, Boston Children's Hospital, Author.
- Prof. Abhay Vasant Ashtekar, Evan Pugh Professor Emeritus of Physics and former Director of the Institute for Gravitational Physics and Geometry at Pennsylvania State University, creator of Ashtekar variables

Various Events organized during the conclave:

SCIENTIFIQUE, ATELIER, CONNAISSANCE, DISCUTIR, EMPRENDIMIENTO, HACKATHON, INDSOL, TECH TALK, INNOVATION EXHIBIT, INTEGRATION BEE, MATH OLYMPICS, D'SinoQuation

## EVENTS ORGANIZED UNDER IIT GUWAHATI TECHNOLOGY INNOVATION HUB (TIH) / TECHNOLOGY INNOVATION AND DEVELOPMENT FOUNDATION

- A 5-day **Online Workshop on Dynamics and Control of Mechanical, Electrical and Robotic Systems through MATLAB:** (total no. of participants 51) Many experts in the field of Mechanical, Electrical, Robotics, and Mechatronics enlightened the participants about the basic and advanced level coding related to various practical systems such as underwater unmanned vehicles, Intelligent vehicles, Multibody systems, Electrical and Mechatronics systems etc.
- A 5-day **Short Term Course on Robotics for School Children:** (total no. of participants: 50) A workshop at Chhaygaon College, Chhaygaon, Kamrup District, Assam, focused towards knowledge sharing sessions on mechanism of underwater robotics for the primary and secondary school children of the localized schools.
- **Software Skill Development Program on Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM):** (total no. of participants: 116) Demonstration of various useful software and tools like Soliworks, Inkscape, NX, MasterCAM, Autodesk, 5-axis CNC machine, robotic-arm, etc. were done to the participants by experts from industries and academia.
- A 5-day **Workshop on Underwater Communication: Technologies and Opportunities:** (total no. of participants: 14) The main objective of this workshop was to attract researchers from various universities/institutes and research organizations to inspire the exchange of ideas related to underwater communication and future collaboration, and, provide insight into the emerging research opportunities in underwater communication systems in terms of design and application to the end users.
- A 5-Day Online **Workshop is on Machine Learning (ML) and Deep Learning (DL) Techniques** (total no. of participants: 97) with applications covering both Theory and Hands-on part involving Academia-Industry Experts. It aimed to bridge the gap between Academia and Industry on a trending topic like Machine Learning and Deep Learning.

**Short Course on Bulk Coal Handling:** (total no. of participants: 12) The objective of the course was to train the cadre of young engineers in bulk coal handling sector with industry relevant knowledge which may not have been taught in their engineering curriculum and to impart knowledge, training and skill development of practicing young engineers in core engineering sectors viz. Power, Steel, Mining, Material Handling, Maritime, Oil & Gas, etc.

## **ALUMNI AND EXTERNAL RELATIONS (AER)**

### **MEMORANDUM OF UNDERSTANDING (MOUs)**

The AER office currently handles MoUs for Academic and Research Collaborations with International academic institutions and organizations. At present there are 58 MoU active with institutions and organization from all over the world. During this coronavirus pandemic, IIT Guwahati have signed and renewed MoU with 6 International university/institutes/organizations. The following are the names:

- University of Tsukuba, Japan
- National Taiwan Ocean University, Japan
- Technical University Munich, Germany
- GIFU University, Japan
- Dalhousie University, Canada
- MDS IndoCan Inc., Canada

### **ON GOING JOINT MASTERS' DEGREE /JOINT Ph.D/DUAL AWARD PROGRAMME**

In collaboration with six foreign Universities, IIT Guwahati has created joint degree programs designed to prepare students for acquiring balanced expertise with effective understanding on various aspects of Science and Engineering. The following are some of the ongoing Masters and Ph.D. programme:

1. Joint Academic Program (M.Tech.) in Food Science and Technology with GIFU University of Japan as the partner.
2. Joint Ph.D. Program with GIFU University of Japan in Food Science & Technology and Integrated Mechanical Engineering.
3. Joint Ph.D. Program in Bio Informatics with Heidelberg University of Germany, BSBE.
4. Collaborative Ph.D. Program with National Institute of Material Science (NIMS) Japan.
5. Ph.D. under Dual Award Program with Western Sydney University, Australia.
6. Joint Ph.D. under Dalhousie University, Canada

### **Visit of delegation from University of Tsukuba, Japan**

A Collaborative meeting was held between University of Tsukuba, Japan & IIT Guwahati on 26.06.2023. University of Tsukuba was represented by Prof. Osamu Ohneda, Assis. Prof. Mizuho Fukushige & Mr. Naoki Hibio and Prof. Takeaki Sakurai was through online mode. IIT Guwahati was represented by Prof. P K Iyer, officiating Director, IIT Guwahati, Dean R&D & AAER and senior professors of different departments.





**Japan Education fair, Namaste Japan 2023 organized by The University of Tokyo and Gifu University, in collaboration with IIT Guwahati**

The University of Tokyo and Gifu University, in collaboration with IIT Guwahati is organized the Japan Education fair, Namaste Japan 2023 on 16<sup>th</sup> September 2023, at IIT Guwahati.

A total 15 Japanese delegates from JICA, Embassy of Japan (India), University of Tsukuba, International University of Japan, Gifu University, The university of Tokyo and Ritsumeikan University came and presented all the schemes/scopes for academic and industry collaborations in Japan.

250+ students from 18 institutions in and around Guwahati city attended this event along with 6 Japanese Universities, Embassy of Japan, JICA, along with representatives from other Japanese institutions and bodies.

Booths for interaction with representatives from the four universities, viz. The University of Tokyo, Ritsumeikan University, International University of Japan, University of Tsukuba were available for on-site individual consultation.

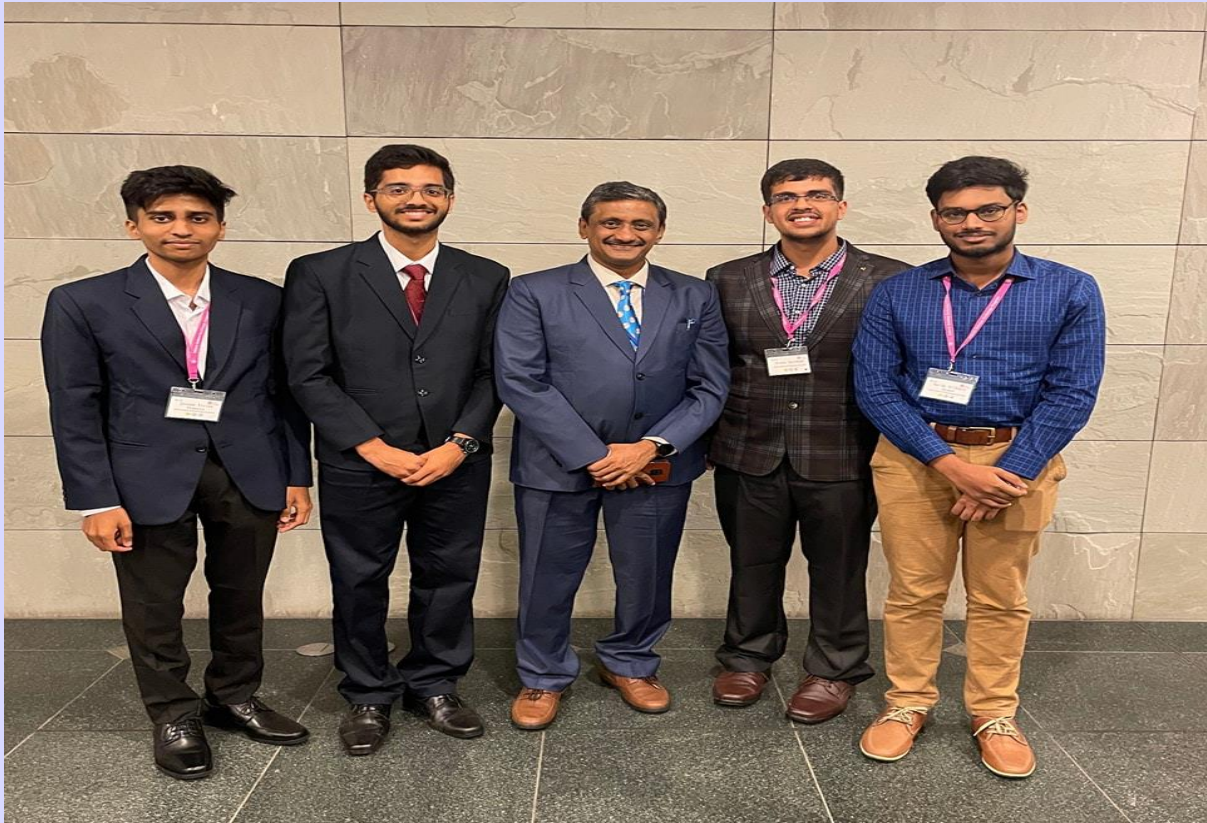


**Sakura Science Indian University Program 2023 at the reception hosted by the Ambassador of India at the Embassy of India, Tokyo**

Four students who were selected from the institute for the Sakura Science Indian University Program 2023 at the reception hosted by the Ambassador of India at the Embassy of India, Tokyo.

Vivian Francis Joseph (Biosciences and Bioengineering, B.Tech 3<sup>rd</sup> year), Gilkara Arnav Naidu (Engineering Physics, B.Tech 4<sup>th</sup> year), Sarthak Diwan (Mathematics and Computing, B.Tech 4<sup>th</sup> year) and Goutham Jyothilal (Mechanical Engineering, B.Tech 4<sup>th</sup> year) were among the 49 Indian students who, from September 24 to September 30, had the opportunity to explore Japan's academic and research world by visiting top Japanese universities and research institutions.





### **Inauguration of IITACB, Bengaluru**

IIT Alumni Centre, Bengaluru (IITACB) has been inaugurated and to commemorate this launch IITG alumni Association had events spread over two days - September 9-10, 2023 where Prof. Sumana Dutta, Associate Dean, AER attended. It is set up by the IIT alumni with the purpose to help create synergy between the IITs and industry/government services in Bengaluru and beyond. The facility has come up as an important landmark for the IIT community in Bengaluru. IIT Guwahati alumni now has an address at Bengaluru from where they can plan programmes and collaborate with industries / organisations, other IITs and also network amongst themselves.



## **Alumni Award 2023**

The Institute's Alumni Award 2023 Ceremony was held on 9 Feb 2024 in the Dr. Bhupen Hazarika Auditorium of the Institute. This event was hosted by the Alumni and External Relations office of IIT Guwahati. The Director, IIT Guwahati Prof. Gautam Barua attended the event as the Chief Guest.

The Dean, Alumni and External Relations, Prof. Mihir Kumar Purkait inaugurated the session and welcomed the august audience. The event was also attended by the Dean, Academic Affairs and some distinguished faculty members of the Institute. The winners of IIT Guwahati Alumni Awards 2023 are:

### **DISTINGUISHED ALUMNI AWARD**

1. Mr. Puneet Talesara, a 2002 IIT Guwahati alumnus, is the founder of Pyrotech Workspace Solutions.
2. Mr. Prabhat Gupta, a 2008 IIT Guwahati alumnus, is a co-founder of Travel Triangle and Nected.

### **YOUNG ALUMNI ACHIEVER AWARD**

1. Akshat Jain, 2017 IIT Guwahati alumnus, is an IAS Officer.
2. Dr. Siva Teja Kakileti, a 2015 alumnus of IIT Guwahati, one of the Directors and founding team at NIRAMAI

### **OUTSTANDING SERVICE AWARD**

1. Mr. Mohit Bansal, a 1999 IIT Guwahati alumnus, is a Risk & Compliance industry expert

The winners shared their experiences at IIT Guwahati and expressed their gratitude to their alma mater for recognising their achievements. The event ended with a vote of Thanks from the Associate Dean, Alumni and External Relations, IIT Guwahati.

**Visit of French delegation led by Dr. Didier Raboisson, Attaché for Scientific and Academic Cooperation at the Embassy of France in New Delhi**

A three member French delegation led by Dr. Didier Raboisson, Attaché for Scientific and Academic Cooperation at the Embassy of France in New Delhi visited IIT Guwahati on 20.02.2024. Prof. Mihir Kumar Purkait, Dean, Alumni & External Relations gave the welcome address, followed by felicitation to the delegation from IIT Guwahati. Along with Prof. Purkait, Prof. Sumana Dutta, Associate Dean, Alumni & External Relations, Prof. K.V. Krishna, Dean, Academic Affairs, Prof. Bulu Pradhan, Associate Dean, Academic Affairs and Prof. Sudip Mitra, Professor, School of Agro and Rural Technology interacted with the delegation on foreign collaborations. Both parties emphasized on further research and academic collaborations between French Institutes and Indian Institute of Technology Guwahati.



**Memorandum of Understanding signed with Dalhousie University, Canada**

IIT Guwahati signed MoU with Dalhousie University, Canada on Joint Ph.D programme. Prof. P. Balakrishnan, Dalhousie University signed the MoU in presence of Prof. Rajeev Ahuja, Officiating Director, IIT Guwahati.





**THE FOLLOWING ARE THE LIST OF FULL TIME/EXCHANGE FOREIGN STUDENT REGISTERED IN IIT GUWAHATI IN 2022-23 (INBOUND):**

The year 2022-23 saw a steep drop in students' mobility, all over the world, due to the Pandemic. There were some 11 students from various countries who registered for full time courses at IIT Guwahati. Following is the list of the same:

SL NO.	NAME	Country	Programme	Department/Centre
1.	Suzune Hayashi	Japan	Joint M.Tech. (Exchange)	BSBE
2.	Shunta Goto	Japan	Joint M.Tech. (Exchange)	BSBE
3.	Saki Sugihara	Japan	Joint M.Tech. (Exchange)	BSBE
4.	Isabel De Paula Diez De Rivera Vergara	Spain	B.Tech. (Exchange)	Mathematics
5.	Amit Kumar Sah	Nepal	Ph.D.	Jyoti and Bhupat Mehta School of Health Sc. And Technology
6.	Yudai Ogata	Japan	B.Tech. (Exchange)	EEE
7.	Guillermo Carrasco Soto	SPAIN	B.Tech. (Exchange)	Physics

- \*1 Ph.D. scholar from Portugal pursued internship, 34 nos. of students from Hanyang University, South Korea visited for 29 days' internship and 1 Ph.D. scholar from Japan is pursuing internship.

**SEMESTER EXCHANGE / RESEARCH INTERNSHIPS WITH PARTNER UNIVERSITIES (OUTBOUND):**

IIT Guwahati has signed MoU for Collaborative Programme with various Universities/ Institutes across the world. Even during the pandemic, students from IIT Guwahati were selected for exchange/research internship with prestigious International University/Institute. As many as 70 students were selected for such programme.

## **INFRASTRUCTURE DEVELOPMENT IN THE INSTITUTE**

The following are ongoing and recently completed projects in the Campus:

**1. Expansion of Academic Complex Phase-VI:**

The work has been completed on 31.07.2023. The building is G+7 storied and have classrooms, laboratories, faculty rooms and office spaces. It is a fully Air Conditioned building with total area of 6959.85 sqm. The sanctioned HAFA load for the project is `38.20 crores.

**3. Construction of 160 units of F-type residential quarters:**

Construction of 160-units of F-Type residential quarters in 4 towers having 40 units in each tower having all basic amenities has been completed on 30.09.2023. All the 4 towers are B+G+9 storied building with 42.35 height and they are under occupation. The project was executed by taking loan of `159.63 from HEFA.

**4. Economically weaker section Students' Hostel (Gourang Hostel):**

The Hostel is G +3 building consisting of two blocks namely Block A consisting of 250 double seater room, Office, warden room, Visitors room etc. and Block B is consisting of Dining Hall, Kitchen, pantry, Food Court, Reading room, Games Room, Activity room etc. As per requirement of the Institute, 134 rooms of the hostel were completed and allotted to students in July 2023. The balance rooms will be ready for occupation from next Academic session starts in July 2024 by July 2023 and whole hostel is expected to be completed by January 2024.

**5. Electrical infrastructure:**

At present Institute have one 33 /11 KV substation with the capacity of 17.5 MVA, comprising of 1 X 7.5 MVA and 2 X 5 MVA transformers in the campus to provide power supply to the Academic Complex, hostels, residential quarters including other Institute Buildings. This 33KV sub station is connected from 132KV Grid substation of APDCL near to the IITG Campus. The Institute has 11 numbers of 11KV distribution sub stations in various locations in the Campus through which the power supply is distributed to the entire Campus. Considering the power requirement for various upcoming Academic Departments(BSBE) and other buildings such as Research park and Nano Technology Centre etc. one new 11KV distribution substation has been considered and the Civil Construction works of new substation building has already been completed. The electrical equipment like transformer, HT switchgear and other accessories likely to be arrive soon. Simultaneously upgradation of existing 11KV substation in the campus are considered and under progress.

Due to rapid growth of the Institute the Power requirement in the Campus is also increasing. The Institute has already attained the sanctioned demand of 6.3 MW. To cater the additional electrical load about 2 MW roof top solar Power Plant has also installed in the Campus and commissioned.

In addition to the above, it has been approach to APDCL for additional sanction of 2.1 MW Power in the existing 33 KV system.

Over and above, process has been initiated for installation of another 1 MW capacity roof top solar power plant in the campus.

**6. AC infrastructure:**

Due to Rapid expansion IIT Guwahati academic complex augmentation of air conditioning system become essential. Today IIT Guwahati have two HVAC plants having total 3000TR capacity provide air-conditioning facility to most areas like whole academic complex, lecture hall complex auditorium, CCC, conference center, lecture hall complex, and library building etc.

In addition to this, other types of air-conditioning like VRV air conditioning system (1800TR capacity) is an energy efficient AC system installed in buildings like NEW SAC, new guest house, Research building, Research Park, estate office building and class rooms of Core –I, II, III and IV.

Moreover, there are another 1200TR capacity of allied AC systems comprising of window splits, Ductable ACs are also installed in Admin. Building, Central Workshop, D type community hall, Technology complex, Old Guest House and some labs in Academic complex.

In view of the growing Academic expansion, HVAC infrastructure facility is also considered for upgradation from time to time.

Considering futuristic demand, the Competent authority has approved in first phase to upgrade the HVAC central plant with 1 No. of 600 TR centrifugal water cooled chiller to cater the AC load in the campus. Accordingly, tender for the work has been invited through e-tendering as per the new guidelines. The tender has been awarded and work is in progress.

**7. Bio Science & Bio Engineering (BSBE) Building: (To be renamed as Academic Tower –1)**

The proposed BSBE building is G+5 storied of area 12,500 sqm. The building consisting of 25 Research Laboratories, 6 other Laboratories including office, store, DCIF, Autoclave room, High end equipment, conference room etc. The work was on hold due to site hindrance caused by the underneath isolated rock boulders at 4.0 m creating difficulty in execution of building foundation. As per decision of the Institute the foundation for the building has been redesigned with enhanced capacity to take another 4 floors to get more space in the building. The 94<sup>th</sup> B&WC accorded the technical sanction for the revised design for changing the foundation for G+5 to G+9 storied building. Accordingly, after approval of competent authority the work has been resumed in March 2024. In Phase-I work with revised foundation design and up to G+5 level will be executed. Remaining four floors above G+5 level will be taken up based on availability of fund / HEFA loan.

The schedule date of completion of Phase-I work is September 2026. Revised project cost stands at ₹81.87 Crore.



**8. Core Laboratory Building:**

There are 6 laboratories, 6 store rooms and 2 faculty rooms in the building. The work has been allotted after tendering with scheduled time for completion of 18 months. The contractor has started the piling work for the building. Due to proximity to existing Academic Complex the work could be executed at night shift only to minimize disturbance in Academic / Research activities.

It is a G+2 storied building with total built up area of 3630 Sqm. The building houses 2 laboratories in each floor with faculty room and storage space. The sanctioned HEFA loan for the project is `15.00 crores.

At present 60% of the work has been completed. The work is expected to be completed by December 2024.

**9. International students' Hostel:** Total occupancy of the hostel is 91 with attached washroom and kitchen. The hostel includes, Multipurpose hall, Media/study room, office room, warden room and electrical room etc. The site for the Hostel is located at the back side of New Guest House and Hospital having access from the main road of the serpentine Lake.

The scope of work includes construction of G+2 storied RCC building with built up area 3310 sqm. The hostel is meant for accommodating the International students and faculties. The sanctioned HEFA loan for the project is ` 15.00 crores. The present progress of the work is about 70%. The work is expected to be completed by December 2024.

**10. Extension of Mechanical Department:**

The scope of work was vertical extension of two floors area of the existing G+1 annexe building of Mechanical department. The sanctioned HEFA loan for the project is `11.00 crores. The work is expected to be completed by April 2024.

**11. Extension of Research building, SAC, Class room:**

The scope of this work includes finishing works in top 4 floors of Research Building, top floor of New SAC building and top two floors of class room complex.

The sanctioned HEFA loan for the project was ` 10.51 Crores.

The work of Internal finishing of Research Building and SAC has been completed in September 2023.

Work of Class room complex is being executed through Assam PWD as deposit work.

**12. Mehta Family school of data science and artificial intelligence and Health Science:**

The Mehta Family has agreed to fund for construction of Academic Building for Data Science & Artificial Intelligence and Health Science in IITG Campus. The approximate area of the building is 9244 sqm.

Selection of Architect for the project has been completed and the conceptual drawing submitted by the consultant has been approved.

Structural vetting of the design & drawings area in progress at Civil Engineering department of the Institute. After technical sanctioned by the B&WC tendering process for the execution of the work will be started.

## Upcoming project in the projects:

### 1. G+9 storied 2000 seater double occupancy Boys' Hostel

Presently there are 11 Boys' hostel with capacity of 6500. Due to shortage of rooms, 3000 students are sharing single seater accommodation in the hostels. This is likely to increase in near future.

For proper accommodation a 2000 seater hostel has been proposed to be constructed by the availability HEFA loan. This will be a double seater hostel of G+9 storied.

Architect empanelment for the project is process.

## STUDENTS ACTIVITIES

Students' Affairs umbrellas several subdivisions that deal with student extracurricular activities, including technical, sports and cultural boards, and subdivisions like the Welfare Board and the Hostel Affairs Board that ensure the overall well-being and holistic development of a student. While academics make up a crucial part of a student's college life, several other integral factors contribute to a student's success and well-being. These subdivisions of Students' Affairs ensure that no stone is left unturned in this aspect and that a student's life outside academics is as fulfilling, enriching and comfortable as possible.

A few of the major events conducted in 2023-24 is detailed below.

**37<sup>th</sup> Inter IIT Aquatic meet 2024:** The 37<sup>th</sup> Inter IIT Aquatic meet 2024 at IIT Gandhinagar during 04<sup>th</sup> - 08<sup>th</sup> October 2023. IIT Guwahati students performed very well at Aquatic events of swimming and water polo. Some of the Medal winners are as follows:

List of IITG Medal Winners of Inter IIT Aquatic meet 2023 are as below:

Kushal Dornahalli -100mBreast stroke	Gold medal
Bharghov Phukan - 50m Butterfly	Gold medal
Kushal Dornahalli-50 m Breaststroke	Gold medal
Kushal Dornahalli, Bharghov Phukan, Shlok Suraiya, Rajib Modak -4x100m Freestyle relay	Gold medal
Bharghov Phukan, Shlok Suraiya, Rajib Modak, Kushal Dornahalli, — 4x100m medley relay.	Silver medal
Bharghov Phukan-50 breaststroke	Silver medal
Bharghov Phukan—50m Freestyle	Silver medal
Kushal Dornahalli--200m medley	Bronze medal
Men's Swimming Team	Runner up trophy

**Spirit 2023:** Spirit 2023, the annual inter-education institution sports event was held at the Institute during November 2023 for sports events like Athletics, Badminton, Basketball, Cricket, Chess, Football, Hockey, Kho-kho, Tennis, Table-tennis, Volleyball, Weightlifting, Swimming, Yoga. The event was inaugurated by the Director of the Institute in presence of Dean of Student affairs. It was participated by students with enthusiasm from various other education institutions.

**56<sup>th</sup> Inter IIT Sports Meet 2023:** 56<sup>th</sup> Inter IIT Sports Meet 2023 was held jointly at IIT Bombay & IIT Gandhinagar during December 2023. IIT Guwahati participated in events like Athletics, Badminton, Basketball, Cricket, Chess, Football, Hockey, Lawn Tennis, Table tennis, Volleyball, Weightlifting. Team has improved their overall performances in the major events. IIT Guwahati won medals as follows:

Medal Tally of IIT Guwahati at Inter IIT Sports Meet 2023:

- CK Soorya- Gold Medal -- High Jump (M)
- Vijay Kumar Singh- Gold Medal -- Shot Put (M)
- Amresh Kumar- Silver Medal -- Javelin Throw (M)
- Ranjeet Soren, Suyash Lilke, Shubham Saxena, Kalpajyoti Mazumdar- Bronze Medal -- 4x100m relay (M)
- Ranjeet Soren -Bronze Medal -- 100m (M)
- Tanuja Painkra -Bronze Medal -- High Jump (W)
- Tanuja Painkra -Bronze Medal -- Javelin Throw (W)
- Vilchoo Pussa -Gold Medal – Weightlifting
- Rushi Pankhade - Gold Medal – Weightlifting
- Vijay Kumar Singh -Bronze medal – Weightlifting

**SPICMACAY:** SPIC MACAY (Society for the Promotion of Indian Classical Music and Culture Amongst Youth) is an organization dedicated to introducing the youth to the richness of Indian traditional arts. The IIT Guwahati Chapter of SPIC MACAY has been a cornerstone in bringing this mission to life on campus, fostering a vibrant cultural atmosphere throughout the academic year 2023-2024. By organizing a plethora of events that span workshops and performances across various Indian classical music and dance genres, the Chapter has significantly contributed to nurturing an appreciation for India's cultural.

heritage among students and faculty. The activities conducted by the Chapter not only highlighted the diversity of Indian arts but also created interactive platforms for the campus community to engage directly with the art forms. Events like the Virasat festival were particularly notable for showcasing the talent of artists from across the nation, emphasizing the Chapter's role in enriching the campus's cultural fabric. This overview aims to capture the essence of the SPIC MACAY IIT Guwahati Chapter's efforts in making the 2023-2024 academic year a landmark period for cultural exploration and appreciation.

**ALCHERINGA:** Alcheringa 2024, an annual cultural festival hosted by IIT Guwahati, was a grand celebration of artistic expression, talent, and cultural diversity. This report aims to provide a comprehensive analysis of the various components that contributed to the success of the event.

Alcheringa 2024 featured a total of 47 competitions, spanning a wide range of art forms and themes. These competitions provided a platform for participants to showcase their talents and compete in areas such as music, dance, literature, visual arts, drama, quizzes, sports, photography, videography, design, fashion, poetry, fine arts, and sculpturing. Flagship competitions such as Rap Battle, Beat Bash and Mr & Ms Alcheringa attracted top talents and garnered significant attention from the audience. These competitions showcased the highest levels of skill and creativity among participants.

**Pro Shows and Pronites:** The festival hosted pro shows featuring renowned artists like Urban Breeze, Assudurite, Kalou, DJ Shaw, DJ Animagous Roy, and Void. These shows provided entertainment and engaged the audience with their captivating performances. Pronites featured international and national artists such as Charles B (Tomorrowland), Armaan Malik, and TrapperX, adding to the festival's appeal and attracting a large crowd of music enthusiasts.

**Creators Camp and Esports Contests:** The Creators Camp consisted of panels such as the Leaders League, Women's Panel, and Content Corner, offering valuable insights, networking opportunities, and discussions on various topics. Esports contests under the theme "Critical Damage" included FIFA, Lichess, and Valorant tournaments, drawing gaming enthusiasts and providing a competitive platform for players to showcase their skills.

**IITG Model United Nations (IITG MUN):** The introduction of the IITG MUN provided participants with a platform to engage in diplomatic simulations and discussions on global issues. Committees such as Lok Sabha, UNHRC, UNOC, and League of Nations deliberated on topics ranging from democratic processes to human rights and environmental sustainability.

## **FACULTY AND STAFF**

The regular faculty strength at the end of March 2023 was 445, with strength of Visiting/ Honorary faculty being 70+. The number of non-teaching staff at the end of March 2024 was 516.

## **INSTITUTE EXPENDITURE**

The details of expenditure including utilization of unspent balance & Internal Resources on Capital Account during the year 2023-24 (provisional) are as follow (in crores):

Revenue expenditure	: 457,01,96,115.94
Capital expenditure	: 80,01,14,389.64
R&D	: 179,77,00,000.00
<b>Total Expenditure</b>	<b>: 716,80,10,505.58</b>

## CAMPUS PLACEMENT

The placement scenario of IIT Guwahati for the year 2023-24 has been impressive. More than 448 companies/organizations from various categories [Private, MNC (Indian origin and Foreign origin), Govt., PSU, NGO, etc.] and sectors (Sector wise- IT, R&D, Core Engineering, Consulting, Analytics, Finance, Oil & Gas, Educational, etc.) participated in the recruitment process. It includes a total of 12 PSUs.

The total number of registered students for campus placement in the year 2023-24 is 1654 and 1084 nos. of students already got placed so far. A total of 219 numbers of students received PPOs this year. It is worth mentioning that a total of 102 students got package of 50 LPA.

A total of 841 number of B.Tech students registered for placement in 2023-24. Among this, 622 (74%) students have been placed so far. Overall, more than 40% students have been placed in the respective core sectors.

Students' internship record has been pretty good this year. More than 115 companies registered for internship in 2023-24 and 426 nos. of students received internship offers so far. There was 100% internship offers for MBA students. Further, a significant increase in master's students' internships has been witnessed as compared to last year's data.



## **PART II**

### **ACADEMIC DEPARTMENTS**

Biosciences and Bioengineering  
Chemical Engineering  
Chemistry  
Civil Engineering  
Computer Science and Engineering  
Design  
Electronic and Electrical Engineering  
Humanities and Social Sciences  
Mathematics  
Mechanical Engineering  
Physics

### **ACADEMIC CENTRES**

Centre for the Environment  
Centre for Indian Knowledge Systems  
Centre for Nanotechnology  
Centre for Linguistic Science and Technology

### **EXTRAMURAL CENTERES**

Computer & Communication Centre  
Central Instruments Facility  
Lakshminath Bezbaroa Central Library  
Centre for Career Development  
Centre for Educational Technology

### **SCHOOLS**

School of Agro and Rural Technology  
School of Buisness  
Mehta Family School of Data Science and Artificial Intelligence  
School of Energy Science and Engineering  
Jyoti and Bhupat Mehta School of Health Science and Technology

# Biosciences and Bioengineering



**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 2002**

**ACADEMIC PROGRAMS OFFERED:**

- B.Tech in Biosciences and Bioengineering
- M.Tech in Biotechnology
- M.Tech. in Bioengineering
- PhD in all areas of Biosciences and Bioengineering

**LABORATORY FACILITIES**

- i. MAB (Mechanistic Approaches to Biology) Laboratory (Prof. B. Anand):** The current focus of our vibrant research group is directed towards addressing fundamental and important questions in the area of RNA biology by employing an eclectic mix of modus operandi that is drawn from biochemical, biophysical, computational and molecular genetics approaches. Our immediate obsession is to resolve the mechanistic questions pertaining to CRISPR Biology and Ribosome Biogenesis.
- ii. BERL (Bioengineering Research Laboratory) (Prof. Utpal Bora):** The research interests of this laboratory include Biomedical Engineering, Seri-biodiversity, Seri-bioinformatics and Bio-entrepreneurship.
- iii. Molecular Networks and Recombinant Therapeutics (Dr. Biplab Bose):** The lab is interested in understanding the inter-connected cellular communication systems. Particularly, the lab is interested to know the effect of architecture, kinetics and integration of the molecular pathways on vital cellular processes. The lab uses experimental as well as theoretical tools to understand how information is carried and processed in such signaling networks. The lab is also involved in developing molecules that can target particular signal transduction pathway. Such a molecule can be used to modulate an aberrant pathway involved in a particular disease.
- iv. Plant Tissue Culture & Secondary Metabolite Production Laboratory (Prof. Rakhi Chaturvedi):** The tree species with long generation cycle are mostly highly heterozygous in nature due to strict cross pollination and are considered to be recalcitrant (difficult to regenerate in vitro). The genetic improvement of these plants and development of homozygous lines (pure) is either very challenging or impossible using the conventional methods, because the cross pollination is a rule. This limitation has completely been overcome by the research group of Dr Chaturvedi while working on two complex tree species, Neem (*Azadirachta indica*) and Tea (*Camellia species*). Prof. Chaturvedi's laboratory has also involved in developing Plant Cell Culture Technology as an alternative to whole plant extraction for the production of secondary metabolites of medicinal and commercial values. Although these compounds can also be isolated from naturally grown whole plants, continued destruction of plants for the purpose may pose a major threat to species getting extinct. Her research group is able to identify, purify and isolate three main categories of bioactive metabolites: essential oils, coumarins and alkylamides, from in vitro elite cell lines of medicinal plants. Some of these compounds are complex triterpenoids which are difficult to synthesize chemically. The focused research work in the laboratory are: (i) Mass multiplication by micropropagation/clonal propagation of medicinally and economically valuable plants, (ii) In vitro haploid and doubled haploid plant production to generate homozygous (pure) lines to produce hybrid vigour for improved plant yield, (iii) Triploid plant production to develop seedless variety, (iv) Somatic embryogenesis for synthetic seed production, (v) Protoplast isolation and regeneration for single cell cloning and isolation of mutants, (vi) Cytological and Histological studies of in vitro raised cultures to understand their ploidy, development and origin (vii) Cell biomass production in shake-flask for screening, characterization and quantification of medicinally and commercially useful plant metabolites and their scale-up in photo-bioreactors

- v. **Biophysical Chemistry Laboratory (Prof. Nitin Chaudhary):** The laboratory focuses on understanding the molecular self-assembly and amyloid diseases, protein/peptide membrane interactions, and developing peptide based antibiotics.
- vi. **Bioprocess Development Laboratory (Prof. Debasish Das):** Bioprocess Development Lab majorly focuses on developing and demonstrating sustainable technologies towards renewable fuels. We are currently working on developing sustainable technologies towards biocrude production from microalgal isolates, butanol production from *Clostridium* sp, ethanol fermentation from adapted *Z. mobilis* strains. We have ventured towards plant tissue culture and demonstration on a pilot scale facility with industrial collaboration.
- vii. **Prof. V. V. Dasu Laboratory:** The laboratory focuses on Bioprocess development (upstream to downstream), metabolic engineering, and bioenergy.
- viii. **Cancer Therapeutics (Prof. Siddhartha Sankar Ghosh):** The laboratory focuses towards delineating the interconnected molecular pathways involving EMT and MDR as a potential therapeutic strategy to obliterate aggressive malignancies. We have ventured into activated signaling pathways, such as the Wnt and Notch signaling pathways and are exploring the use of gene therapy, protein therapy, SMIs, exosomes and membrane-derived nanovesicles as candidate therapeutic molecules that could be applied to target these pathways, along with the combination of rational therapeutic modalities. The lab has also set up infrastructure facilities for interdisciplinary collaborative research in the field of nanoscience and nanotechnology supported by extramural funding at IIT Guwahati. The major area is to develop new nanoparticles, nanocomposites and nanocarriers and evaluate their antimicrobial and anticancer activities
- ix. **Biosensor and Biofuel Cell Research Laboratory (Prof. Pranab Goswami):** The lab is involved in the development of novel bio-recognition system and their applications for developing biosensors and biofuel cells. DNA aptamers, catalytic as well as non-catalytic proteins have been investigated as biorecognition elements for some clinical applications targeting to operate in point-of-care and resource limited environments. Focus has been given on the rapid detection of acute myocardial infarction (AMI), cholesterol, alcohol, bilirubin and malaria due to their obvious importance in diagnostic sector.
- x. **Carbohydrate Enzyme Biotechnology Laboratory (Prof. Arun Goyal Lab):** Research related to molecular biology, protein engineering, structural and functional proteomics of carbohydrate active enzymes are carried in this lab
- xi. **Neural Engineering Laboratory (Dr. Cota Navin Gupta):** Broadly the research lab's current focus is in the areas of brain computer interfaces, imaging genetics for psychiatric disorders, multimodal/multivariate algorithm development and designing wearable medical solutions for patient mobility.
- xii. **Stem Cell and Cancer Biology Group (Prof. Bithiah Grace Jaganathan):** The current focus of the research group is to understand the role of mechanotransduction in stem cell differentiation and cancer metastasis. The group also studies various signaling pathways and microenvironment mediated chemoresistance in leukemia and breast cancer.
- xiii. **Structural and Computational Biology Laboratory (Prof. Shankar Prasad Kanaujia):** The lab uses the knowledge of various techniques such as molecular biology, structural biology (X-ray Crystallography) and biophysical and biochemical studies to understand the mechanism of different biological functions. In addition, the lab applies the molecular dynamics simulations to further corroborate the results obtained from various experiments. Currently, the lab is focusing on investigating into the mechanisms involved in protein translation initiation, ABC transporters and their role in multidrug resistance.
- xiv. **Molecular Microbiology Laboratory (Prof. Manish Kumar):** The research interests of the lab include (i) Molecular interaction of host-pathogen-vector of infectious diseases, (ii) Gene expression analysis of Spirochete,

*Leptospira interrogans* and *Borrelia burgdorferi*, (iii) Development of a vaccine against outer membrane proteins of *Leptospira interrogans* and *Borrelia burgdorferi*, and (iv) Vector-borne diseases of Zoonotic importance.

- xv. **Viral Immunology Laboratory (Prof. Sachin Kumar):** The paramyxoviruses include viruses that are isolated from many species of terrestrial, avian and aquatic animals. The group includes many important pathogens of humans such as measles virus, human respiratory syncytial virus, human parainfluenza viruses, Nipah virus and Hendra virus and animals such as canine distemper virus and Newcastle disease virus. Newcastle disease virus (NDV) is the prototype member of this family and is a leading cause of respiratory disease in avian species. It leads to huge economic losses to the poultry industry in India. The laboratory focuses mainly on understanding the biology of avian paramyxovirus and development of vaccine against them using reverse genetics system.
- xvi. **Cancer Biology Laboratory (Prof. Ajaikumar B. Kunnumakkara):** The research interests of the lab include (i) Role of inflammatory pathways in cancer development, (ii) Identification of novel biomarkers for cancer diagnosis and prognosis, (iii) Cancer drug discovery, and (iv) Development of transgenic and gene knockout mouse models for biomedical Research
- xvii. **The Molecular Endocrinology Laboratory (Dr. Anil Mukund Limaye):** The laboratory focuses on the following research themes: (i) Hormone regulation of gene expression, (ii) Role of estrogen in breast tumor invasion and metastasis, (iii) Regulation of cystatin A expression and its role in breast cancer, (iv) HoxB2 in breast cancer, (v) GPR30/GPER-1 biology, (vi) Mechanisms of anticancer activity of EGCG, (vii) Karanjin and its biological effects
- xviii. **Dr. Soumen Kumar Maiti Laboratory:** The research interests of the lab include Biochemical Engineering, Biofuel, Bioprocess modeling, control, optimization, Metabolic engineering, Downstream processing, Membrane separation, Bioremediation
- xix. **Biomaterials and Tissue Engineering Laboratory (A DBT Unit of Excellence) (Prof. Biman B. Mandal):** Tissue engineering has emerged as a potential way to regenerate/treat tissue damage or organ failure as a result of injury and/or disease. Our laboratory majorly focusses on using silk biomaterials for developing affordable and functional lab grown tissue/organ replacements for human transplantation. The lab research is directed towards the following areas of importance i.e. Tissue Engineering of Grafts and Implants, Stem Cell Based Regenerative Medicine, Biomaterials, 3D Bioprinting, Drug Delivery Systems, 3D In Vitro Disease Models for high throughput drug screening applications. More than 160 research articles have been published with very high impact and citations, 23 patents, 03 technology licensed, 01 product launched in market.
- xx. **Organelle Biology and Cellular Ageing Laboratory (Dr. Shirisha Nagotu):** The lab focusses on understanding the biogenesis of organelles and the inter-organelle communication within a cell. The lab tries to understand the effect of ageing on organelle biology and the role of organelles in cellular ageing.
- xxi. **Prof. Kannan Pakshirajan's Laboratory:** The research interests of the lab are Environmental Biotechnology, Biological removal and recovery of inorganic compounds from wastewaters, Biofuels and other Biotechnological Products: production, process design, kinetics and environmental applications.
- xxii. **Bio-interface & Environmental Engineering Laboratory (Dr. Lalit Mohan Pandey):** The laboratory focuses on the following research aspects: (i) Surface and interfacial science particularly in the area of Bio-interfaces and Biomaterials (Design of Biocompatible surfaces): The surfaces are modified using various Self-Assembled Monolayers (SAMs) and their interactions with water, bio macromolecules i.e. polymers, proteins and cells are studied, (ii) Protein's adsorption and aggregation: The lab investigates the adsorption behavior and properties of various adsorbed proteins on surfaces with different wettabilities by forming mono, mixed and hybrid SAMs. The role of surface chemistry at the nanometer scale on aggregation of various therapeutic proteins is studied, (iii) Environmental Biotechnology: The lab focuses on 3Rs. Reduce waste generation, recycle the treated waste and reuse waste as by-product or recover energy from the waste.

- xxiii. Enzyme and Microbial Technology Laboratory (Prof. Sanjukta Patra):** The EMT research group studies the microbes and their applications in different spectrums of Metagenomics, Industrial Microbiology, Extremophiles, Environmental Biotechnology, Disease Therapeutics and diagnosis
- xxiv. Molecular Informatics and Design Group (Prof. Vibin Ramakrishnan):** Molecular Informatics and Design Group integrates diverse disciplines of science and engineering in the design and development of advanced materials. The lab's approach to a research problem is 'idea centric' with a clear emphasis on the design phase, adopting modeling and informatics tools. The lab experiments a reductionist approach in understanding the interaction between molecules resulting in assembled architectures at nano and micro scale, and further employ it in the design of future materials. An information based modeling approach has been employed in the design and generation of tumor homing and cell penetrating molecules to test their efficacy as future drug delivery vehicles.
- xxv. Applied Biodiversity Laboratory (Prof. Latha Rangan):** The group tries to address the research questions in areas of Applied Biodiversity with special reference to bioresources of Northeast India using an integrative approach. .
- xxvi. Translational Crop Research Laboratory (Prof. Lingaraj Sahoo):** Pathogens, insects and abiotic stresses cause major losses in yield and quality of crops. The discoveries in basic plant research play a vital role in meeting these challenges by developing technologies to improve agriculture by introducing important traits to crop of interest. The lab employs integrated approaches to identify genes with significant agronomic impact in both model (Arabidopsis) and crops (grain legumes and oil seeds), understand the mechanism by which they function and using this knowledge, develop designer crops for diverse plant abiotic (drought, salinity and nutrient deficiency or toxicity) and biotic (viral and insect) stress conditions, useful for growers, industry and consumers. Besides, the lab is working on biofortification in Asiatic grain legumes for healthcare applications and manipulation of key oil biosynthesis genes yield in *Jatropha*, a tropical perennial biofuel crop to improve oil quality and oil.
- xxvii. Prof. Gurvinder Kaur Saini Laboratory:** The laboratory works in fungal biotechnology. The various aspects that are studied include (i) secondary metabolite production, (ii) development of hyper virulent strains of *Metarhizium anisopliae* and *Beauveria bassiana* using scorpion and spider neurotoxins, (iii) gene stacking in entomopathogenic fungi.
- xxviii. Computational Structural Biology Laboratory (Dr. Priyadarshi Satpati):** Working in biomolecular interactions using computational methods (Molecular Dynamics Simulations, Electronic Structure Calculations etc). We are interested in understanding the speed and accuracy in biological processes. Current projects include studies of antimicrobial-peptide: membrane interactions, drug discovery against *Mycobacterium tuberculosis*, the accuracy of CRISPR-Cas9 editing, transcription factors, Quorum sensing inhibitors or *S. mutans* etc.
- xxix. Bio Process Analytical Technology (BioPAT) Laboratory (Prof. Senthilkumar Sivaprakasam):** Our research area is in line with Process Analytical Technology (PAT), an US FDA initiative emphasizing "Building Quality into Products with Innovative Process Design." PAT is an emerging area of Research with the biopharmaceutical industry employing it at different stages such as raw material characterization, in-process monitoring, and final product analysis. Due to the complex and nonlinear characteristics of any bioprocess, monitoring, measuring, modelling, and controlling (M3C) are critical in bioprocess development.

We, as a crew, study the robust manufacturing of bio-therapeutics, biopolymers, and nutraceuticals. Based on the notion of revamping the microbial cells as factories by manipulating their metabolic pathway, optimizing the process conditions, real-time monitoring, and controlling the critical process parameters (CPPs) to boost productivity and achieve consistent product quality. In our BioPAT lab facility, bioprocess development of a product is facilitated via M3C technique. Employing PAT tools such as fermentation calorimeter, dielectric spectroscopy, exhaust gas analyzer, and optical density probe provides real-time metabolic insights into a

bioprocess. These tools aid in identifying critical process parameters of the processes. Combining real-time measurements obtained from PAT tools with robust control strategies such as inferential control, adaptive control, model predictive control, and data-driven control ensures a consistent quality of the final product.

- xxx. RNA Binding Proteins Laboratory (Dr Kusum K Singh):** The laboratory focuses on the RNA-binding proteins that are involved in the splicing machinery. During splicing of premature mRNA, the spliceosome deposits a multiprotein complex termed exon-junction complex (EJC) onto the mRNAs. The subunits that form the core EJC are eukaryotic translation initiation factor 4A3 (eIF4A3), Y14, MAGOH and barentsz (BTZ, CASC3, and MLN51). Many proteins interact with the core EJC and our focus of study is a protein complex termed as Apoptosis- and Splicing-Associated Protein (ASAP). Components of both ASAP and EJC have been found to function in a wide range of activities pertaining to RNA metabolism including splicing, translation, nonsense-mediated mRNA decay (NMD) and apoptosis. We are currently focusing on the following research areas: Understanding the functions of ASAP with respect to EJC in mRNA metabolism. Elucidating the molecular involvement of RNA-binding proteins (RBPs) in various human diseases such as cancers, neurodevelopmental disorders. Exploring the post-transcriptional gene regulations of different RBPs.
- xxxii. Protein Biophysics Laboratory (Prof. R. Swaminathan):** The main research focus in this lab is to investigate the structure, function and dynamics of proteins using spectroscopic techniques like UV-Visible spectroscopy and Fluorescence spectroscopy. Intrinsic electronic absorption and luminescence spectra in proteins originating from photoinduced electron transfer and charge recombination, respectively are actively studied. These novel spectra discovered in our lab are employed to monitor events like protein folding or aggregation in a label-free approach.
- xxxiii. Calcium signaling Laboratory (Prof. Ranjan Tamuli):** We are interested to understand the molecular mechanism of calcium signaling pathway using the model filamentous fungus *Neurospora crassa*. Calcium ion is a universal second messenger molecule that impacts almost all cell processes in eukaryotes. We hope to extend our Research to understand the role of calcium signaling in memory, learning, and other related areas in future
- xxxiiii. Laboratory for Stem Cell Engineering and Regenerative Medicine (Dr. Rajkumar P. Thummer):** Autologous cell-based therapy is a promising alternative to achieve repair or regenerate damaged cells and/or tissue without any immune rejection. Our laboratory “Stem Cell Engineering and Regenerative Medicine”, mainly focuses on generation of human cells using safe, integration-free reprogramming approaches to derive clinical-grade cells for transplantation. The outcome of our Research will bring patient-specific cell therapy closer to clinic for treatment of various debilitating.
- xxxv. Malaria Research Group (Prof. Vishal Trivedi):** The research interests of the lab include Anti-malarial Drug Discovery, Immunotoxicity studies in Macrophages, Regulation of Innate Immune Response, Endothelial Cells-RBC cytoadherence during Cerebral Malaria, Designing immunostimulatory and Anticancer agents.
- xxxvi. Biochemical and Environmental Engineering Laboratory (Dr. Selvaraju Narayanasamy Lab):** The research group is primarily focused on the treatment of wastewater by microbial enzyme immobilisation, adsorption and advanced oxidation processes like photocatalysis, electrochemical oxidation etc; and unravelling the roles of several next-generation materials like MOF, and MXenes in water treatment. In addition, the lab is actively involved in microbial biodiesel production and process optimisation from industrial wastewater.
- xxxvii. Biomechanics and Simulations Laboratory (Dr. Souptick Chanda):** The Lab is primarily engaged in design and optimization of various orthopaedic implants based on in vitro and in silico biomechanical testing/validations. Simulations for surgery and patient examinations training are also being envisaged at this laboratory.
- xxxviii. Computational Laboratory:** The computational lab is used for carrying out the several computational courses of UG and PG classes such Bioinformatics, Computational Biology, Quantitative Biology, Biological Data analysis etc.

**xxxviii. Experimental Teaching Laboratory:** The laboratory is used to conduct the experimental course of the B. Tech. and M.Tech. curriculum.

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

1. Gas Chromatograph Mass Spectrometer with Auto sampler, Make: Thermo Fisher Scientific, Model: Thermo ISQ 7610
2. Protein Purification system with accessories and operating software, Make: Cytiva, Model: AKTA go
3. ICE Flaker Machine, Make: Wensar Labman , Model: LMIF 100
4. Autoclave (Single Lever Fully Automatic Top Loading, 113L capacity), Make: Equitron Model: #7441 SLEFA
5. Refrigerated Centrifuge, Make: Neuation, Model: iFUGE M24PR
6. Digital Ultrasonic Bath, Make: Grant, Model: XUB5
7. Analytical Balance, Make: Sartorius, Model: BSA224S\_CW
8. Water cooler with purification, Make: Zero B, Model: Zero B UV chill 40-120-120 WCN
9. Video Conferencing system with HDMI Switching , Make: People Link
10. Multifunction Colour Laser Jet Printer, Make: HP, Model: MFP Colour Laser Jet 4303 dw
11. Colony counter, Make: Orange, Model: TCC
12. Mini Subcell GT Horizontal Electrophoresis System, Make: BioRad, CAT No.: 1704467
13. Mini Sub Cell GT Horizontal Electrophoresis System, Make: BioRad, CAT No.: 1704467
14. Power Pack, Basic Power supply, Make: Bio-Rad, Model: 1640300
15. Paper Shredder, Make: GBC, Model: GBC Duo
16. Centrifuge, Make: REMI (Dr. Selvaraju Narayanasamy Lab)
17. Vacuum Oven. Make: IKON (Dr. Selvaraju Narayanasamy Lab)

### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Cell signaling, Systems Biology, Plant Tissue Culture & Secondary Metabolites Production, Protein Biochemistry, Molecular Biology, Immuno Parasitology, Biofuel, Biochemical Engineering, Tissue Engineering and Biomaterials, Stem Cell Biology, Cell Therapy & Regenerative Medicine, Organelle Biology, Inter-organelle Communications, Cellular Ageing, Bio-interfaces and Biomaterials, Environmental Biotechnology, Nanobiotechnology, Chemistry-Biology Interface for Developing Antibacterials and Sensors, Stem cell engineering and regenerative medicine, Molecular Parasitology, Computational Biology, Plant Biotechnology, RNA Biology, Structural Biology, Fungal Biotechnology, Molecular Endocrinology, Enzyme and Microbial Technology, Metagenomics, Environmental Biotechnology, Applied Biodiversity, Biosensors, Systems Biology, Bioprocess Engineering, Cancer Biology, Bio/Physio Sensors and Nanobioengineering, Biosensors and bio-fuel cells, Neural Engineering. Network medicine, Bio-Nano catalysis, Drug delivery vehicles, Preparation of polypyrrole embedded nanocellulose and surfactant (CTAB) modified carbon adsorbent for efficient elimination of azo-anionic dyes. Elimination of pharmaceutical wastes viz. antibiotics using carbon and grass based nanocellulose adsorbents. Phyto, microbial and fish toxicity studies for ecotoxicological assessment of the prepared adsorbents to understand its significance in eliminating pollutants from aqueous bodies, Biomechanics, Soft computing, Artificial intelligence, Machine learning, Implant design.

Initiatives of DBT programme Support: Prof Ghosh as a PI along with other faculty members, involved in DBT Program Support Phase –II project at IIT Guwahati, received project support from the DBT India on “Translation Research Programme for Developing Diagnostics and Nano-based Sensors”. This multidisciplinary programme was formulated based on the major leads of the existing DBT Programme Support project. Besides manpower training and basic Research, this new project is aimed to develop sensors and Transfer of Technology (ToT) to the Start-Up companies. Prof. Ghosh has also received a multi-institutional grant on "mechanistic Investigation for EMT targeted nanotherapeutics".

**Carbohydrate Enzyme Biotechnology Laboratory (Prof. Arun Goyal):** Molecular Biology, Protein Engineering, Structural and Functional Proteomics of Carbohydrate active enzymes, other industrially important microbial enzymes and biofuel production from lignocellulosic agriculture wastes.

**RNA Binding Proteins Laboratory (Dr Kusum K Singh):** We work in the area of RNA binding proteins that are involved in alternative splicing of RNA, its export, translation and decay.

- We have identified novel microRNAs that can regulate UPF3B protein, which is a crucial factor of RNA decay.
- We have established UPF3B as an important NMD factor that regulates a specific subset of substrates that are stabilized in its absence.

**Bio-interface & Environmental Engineering Lab (Dr. Lalit Mohan Pandey):** Bio-interface Engineering, Surface modification, Protein aggregation, Nano-biotechnology, Microbial enhanced oil recovery, Bioremediation of hazardous wastes i.e. oil spills, dyes, heavy metals

**Plant Tissue Culture and Secondary Metabolite production laboratory (Prof. Rakhi Chaturvedi):** We are primarily working in the field of plant tissue culture and secondary metabolite production. Our lab has established a solid foundation, both theoretically and experimentally, in the area of Plant Tissue Culture (PTC) and Secondary Metabolite analysis and large-scale production, Plant Biochemical Engineering, Bioreactor cultivation and Plant Sciences

**Calcium signaling laboratory (Prof. Ranjan Tamuli):** Calcium and cell signaling, Genetics of the filamentous fungus *Neurospora crassa*, DNA repair.

**Cancer therapeutics (Prof. Siddhartha Sankar Ghosh):** Multifaceted approach in cancer therapeutics which encompasses Drug Repurposing, Nanotheranostics and targeting EMT Dynamics.

**Biochemical and Environmental Engineering Laboratory (Dr. Selvaraju Narayanasamy):** Environmental Biotechnology; Wastewater treatment; Biodiesel Production and Optimization; Nanomaterials: Characterizations and Synthesis; Microbial Enzyme Production and environmental application; Advanced Oxidation Processes.

**Organelle Biology and Cellular Ageing Lab (Dr. Shirisha Nagotu):** Organelle biology, Cellular ageing, Membrane dynamics.

## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

1. **Dr. Cota Navin Gupta:** A novel algorithm developed by Neural Engineering Lab, Dept of BSBE, IIT Guwahati in collaboration with National Institute of Mental Health and Neurosciences (NIMHANS) Bangalore may code brain connectivity patterns from structural MRI for healthy individuals and parkinsons patients into a numerical representation. This work published Brain Sciences Journal (<https://doi.org/10.3390/brainsci13091297>) received wide media attention as per below links:



<https://timesofindia.indiatimes.com/city/guwahati/iit-g-algorithm-to-encode-healthy-individuals-parkinsons-patients/articleshow/108691052.cms>  
<https://www.indianeconomicobserver.com/news/iit-guwahatis-novel-algorithm-helps-code-brain-networks20240322093735/>.

**2. Dr. Lalit Mohan Pandey:**

- Surface, interfacial and thermodynamic aspects of the Rhamnolipid-salt systems
- Potential of biosurfactant, Surfactin, for the inhibition of protein aggregation and reducing aggregate-mediated cytotoxicity and inflammation
- Potential and Prospective of Traditional Indian Medicinal Plants for the Treatment of Diabetes
- Green Synthesis of iron oxide nanoparticles for the remediation of toxic heavy metals

**3. Prof. Rakhi Chaturvedi:**

- Doubled haploid production (homozygous diploids) in two challenging tree species, Neem (*Azadirachta indica*) and Tea (*Camellia* species) using in vitro androgenic haploids developed in our laboratory
- Bioreactor cultivation of in vitro generated high yielding cell lines to scale-up the product and process for producing medicinally important metabolites, like azadirachtin, N-alkylamides, catechins, anthocyanins etc. on commercial scale.

**4. Dr. Selvaraju Narayanasamy:**

- Organic polymer doped graphene-based composite for the effective elimination of diclofenac: a detailed study with phytotoxic assessments
- Synthesis, characterization, and application of oxidant-modified biochar prepared from sawdust for sequestration of basic fuchsin: isotherm, kinetics, and toxicity studies
- Graphene-Based Materials in Effective Remediation of Wastewater
- A review on the laccase assisted decolourization of dyes: Recent trends and research progress
- Fabrication of a novel bio-polymer adsorbent with high adsorptive capacity towards organic dyes
- UiO-66 octahedrons for adsorptive removal of direct blue-6: process optimization, interaction mechanism, and phytotoxicity assessment
- Performance analysis of hydrochar derived from catalytic hydrothermal carbonization in the multicomponent emerging contaminant systems: Selectivity and modelling studies
- Harnessing the Chemical Functionality of Metal-Organic Frameworks Toward Removal of Aqueous Pollutants

**5. Dr. Shirisha Nagotu:**

- Two putatively phosphorylated residues T62 and S277 in the dynamin-like protein Dnm1 were characterized and we reported for the first time, a single residue (S277) change that does not alter the localization of Dnm1 but makes it non-functional in a dominant-negative manner. “*This research work published in IJBM Elsevier, was also highlighted in the annual newsletter of Indian Society of Cell Biology 2023*”.
- Two novel pathogenic mutations in  $\alpha$ -synuclein A18T and A29S were characterized for various cellular effects such as ROS accumulation, cytotoxicity, and effect on cell organelles. These mutations exhibited lesser intense phenotype when compared to the most studied A53T mutation

**6. Prof. Siddhartha S. Ghosh:**

Comprehensive *in-silico* and *in-vitro* studies identified potential repurposed drugs for breast cancer therapy. Additionally, suitable co-therapeutic modules were developed to target multiple signaling pathways in triple negative breast cancer (TNBC) cells. Recombinant proteins were developed to possess anti-neoplastic properties

and modulate cancer cell signaling. Suitable drug delivery vehicles were established to target the tumor microenvironment of metastatic TNBC cells for enhancing drug susceptibility.

#### 7. Dr. Souptick Chanda:

- Helped establish Orthotech Research Lab (ORC) inside Research Park, IITG jointly with Orthotech India Ltd., Gujarat.
- Helping students get internships at ORC.
- Developed novel metallic scaffold having osteogenic potential for bone applications.
- Designed a novel spinal cage; to be filed for an Indian patent.

#### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
1.	Arun Goyal	92 <sup>nd</sup> Annual meeting of The Society of Biological Chemists (India): Biological Chemistry, Opportunities and Way forward (SBC 2023)	BITS Pilani, Goa, India	18/12/2023-20/12/2024	International
2.	Arun Goyal	Biotech Research Society India-International Conference on New Horizons in Biotechnology INDIA (BRSI-NHBT 2023)	Thiruvananthapuram, Kerala, India	26/11/2023-29/11/2023	International
3.	Arun Goyal	Research and Industrial conclave (RIC 2023)	IIT Guwahati, Assam, India	14/05/2023-16/05/2023	National
4.	Dr. Anil M. Limaye	6th International Conference on Nutraceuticals and Chronic Diseases.	Chandigarh	22/02/2024 to 24/02/2024	National
5.	Prof. B. Anand	28 <sup>th</sup> Annual Meeting of the RNA Society	Singapore	30/05/2023 to 04/06/2023	International
6.	Dr. Kusum Kumari Singh	Eukaryotic mRNA Processing	Cold Spring Harbor (Virtual mode)	22-26/08/2024	International
7.	Prof. Kannan Pakshirajan	The 1st International Conference on the Practical Zero Emissions (PZETS 2023)	Ho Chi Minh City Vietnam	09/12/2023 – 12/12/2023	International

8.	Prof. Kannan Pakshirajan	International Conference on Trends in Chemical, Energy and Environmental Engineering (ChemEEE-2024)	Visakhapatnam Andhra Pradesh	19/02/2024 – 21/02/2024	International
9.	Dr. Lalit M. Pandey	3rd International Scientific Conference on Environmental Research: Issues, Challenges and Strategies for Sustainable Development and livelihood Security	Karwar Karnataka	01.12.2023 to 02/12/2023	International
10.	Dr. Lalit M. Pandey	International Chemical Conference (ICC-2023): Chemistry for Sustainable Development	Kathmandu, Nepal	25/05/2023 to 27/05/2023	International
11.	Prof. Latha Rangan	New Horizon in Biotechnology NHBT 2023	Trivandrum	28/11/2023	International
12.	Prof. Latha Rangan	DAILAB CAFÉ Series AIST-INDIA DAILAB	Tsukuba & Tokyo, Japan	11-15 /03/2024	International
13.	Prof. Rakhi Chaturvedi	2 <sup>nd</sup> International Conference on Plant Physiology and Biotechnology	Lovely Professional University	April 20-21, 2023	International
14.	Prof. Rakhi Chaturvedi	Research and Industrial Conclave-Integration 2023	IIT Guwahati	May 14-16 2023	National
15.	Prof. Rakhi Chaturvedi	Society for In Vitro Biology Meeting 2023	Norfolk, Virginia, USA,	June 10-14 2023	International
16.	Prof. Rakhi Chaturvedi	Academia-Industry Interface for Promoting Entrepreneurship in Medicinal and Aromatic Plants	Central University of Jammu	July 14-15, 2023	National
17.	Prof. Rakhi Chaturvedi	Recent Advances in Plant Biotechnology (RAPB - 2024)	Pondicherry University, Puducherry, INDIA.	January 23- 25 2024	National
18.	Prof. Rakhi Chaturvedi	Japan-NER Bioeconomic	IIT Guwahati	March 3–5, 2024	International

		Technology Cooperation Symposium2024 ("JNBTCs 2024")			
19.	Prof. Rajaram Swaminathan	14 <sup>th</sup> EBSA Congress 2023	Stockholm, SWEDEN	31/7/23	International
20.	Dr. Selvaraju Narayanasamy	International Hybrid Conference on Nano-Structured Materials and Polymers – ICNP – 2023	Mahatma Gandhi University, Kerala.	14/05/2023	International
21.	Dr. Selvaraju Narayanasamy	CHEM-TECHNOVA 2023	Harcourt Butler Technical University, Kanpur	27/05/2023	International
22.	Dr. Selvaraju Narayanasamy	International Conference on Waste, Energy and Environment – ICWEE-2023	Sathyabama Institute of Science and Technology	07/07/2023	International
23.	Dr. Selvaraju Narayanasamy	International Conference on Molecular Matter – Emerging Directions for Sustainability - ICM-2023	Indian Institute of Technology Madras	18/12/2023	International
24.	Dr. Shirisha Nagotu	Yeast and Life Sciences conference organized by Cold Spring Harbor Asia	Matsue, Japan	10/10/2023 to 13/10/2023	International
25.	Dr. Shirisha Nagotu	International seminar on comparative reflections on gender and higher education in India. Special focus on the NEP 2020 and the states of north east	II Guwahati	5/03/2024 to 6/03/2024	International
26.	Dr. Shirisha Nagotu	Abbelight Safe 360 SMLM imaging platform workshop	IIT Kanpur	14/1/2024 to 15/01/24	National
27.	Prof. Vibin Ramakrishnan	Sustainability-Aligning External and Internal Drivers	HFN Global Head Quarters, Hyderabad	02/05/2023	National
28.	Prof. Vibin Ramakrishnan	Elsevier Editor's Workshop	NIPER KOLKOTA	06/10/2023	International
29.	Prof. Vibin Ramakrishnan	DBT BIC Workshop on Protein	DBT-Bioinformatics Centre, Department	31/10/2023	National

		Modelling: A Rational Tool for Drug Discovery and Development	of Pharmaceutical Sciences and Drug Research, Punjabi University, Patiala		
30.	Prof. Vibin Ramakrishnan	InBix 2023	Vellore Institute of Technology, Vellore	24/11/2023	International
31.	Prof. Vibin Ramakrishnan	9th International Conference on Bio-inspiration and Bio-based approaches	University of Nice/ LE SAINT PAUL HOTEL, Nice, France	12/12/2024	International
32.	Dr. Souptick Chanda	ISTA 2023: The 34th International Congress  New York City, September 27-30, 2023	Sheraton New York Times Square Hotel, NYC, USA	28/09.2024	International

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl.No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1.	Prof. B. Anand	It takes two to tango: CRISPR RNA Biogenesis Requires Two Disparate Cas Nucleases	92 <sup>nd</sup> Annual Meet of Society of Biological Chemists, BITS-Pilani	Goa	19-12-2023
2.	Prof. B. Anand	How CRISPR-based immunological memory is stored in bacterial genome ?	Frontier Symposium in Biology, IISER Thiruvananthapuram	Thiruvananthapuram	03-02-2024
3.	Prof. B. Anand	Bacterial Cell Growth and Dormancy: An Interplay Between Ribosome Biogenesis and Stringent Response Pathway	Recent Advances in Cryo-EM and Chemical Biology, IIT Bombay	Mumbai	09-03-2024
4.	Prof. B. Anand	Mechanistic Basis of CRISPR-Cas Adaptive Immunity	National Conference on Advances in Biochemical Sciences: Basic to Translational Research, Central University of Rajasthan	Bandar Sindri (Rajasthan)	20-03-2024
5.	Dr.Cota Navin Gupta	Invited Talk on Introduction to Cognitive Science and Sensor Applications	INUP-i2i, IIT Guwahati ( <a href="https://www.iitg.ac.in/nano/inup-i2i/assets/news_events/fam_14_16_feb_24/index.html#footer">https://www.iitg.ac.in/nano/inup-i2i/assets/news_events/fam_14_16_feb_24/index.html#footer</a> )	Online	16/2/2024
6.	Dr.Cota Navin Gupta	Invited Talk on Introduction to Cognitive Neuro-engineering and its Applications	Weblink: <a href="https://ibrainiitg23.in/i">https://ibrainiitg23.in/i</a>	Dept of HSS, IIT Guwahati	26/8/2023

			brain/speakers/ (Last Accessed Feb 2024)		
7.	Dr. Kusum Kumari Singh	Transcriptome analysis of UPF3B-knockout cells unveils accumulation of PTC-containing transcripts with IR and ATTS events.	University of Lisbon (Virtual mode)	Caparica Portugal	18/7/2023
8.	Prof. Kannan Pakshirajan	Next generation biorefineries based on <i>Rhodococcus opacus</i> as a biological chassis	Sathyabama Institute of Science and Technology	Chennai Tamil Nadu	05/07/2023 – 07/07/2023
9.	Prof. Kannan Pakshirajan	Biodegradation and toxicity removal of endocrine disrupting phthalates (EDPs)	North-Eastern Hill University	Shillong Meghalaya	13/09/2023 – 27/09/2023
10.	Prof. Kannan Pakshirajan	Biorecovery of metals and selenium: a circular economy approach	Central Institute of Technology	Coimbatore Tamil Nadu	30/10/2023 – 03/11/2023
11.	Prof. Kannan Pakshirajan	Bioengineered systems for biodegradation and toxicity removal of endocrine disrupting phthalates (EDPs)	University of Calicut	Thenjipalam, Malappuram District Kerala	23/11/2023 - 25/11/2023
12.	Prof. Kannan Pakshirajan	Bioremediation	Sherubtse College, Royal University of Bhutan	Kanglung Trashigang Bhutan	25/03/2024 – 26/03/2024
13.	Dr. Lalit M. Pandey	Nano Hydroxyapatite: A Potential Bioceramic for Bone Tissue Engineering	Nepal Chemical Society (NCS), Tribhuvan University, Nepal	Kathmandu, Nepal	05/05/2023
14.	Dr. Lalit M. Pandey	Aahar and Yoga in holistic Healthcare	IIT Guwahati	Guwahati	20/05/2023
15.	Dr. Lalit M. Pandey	Microbial biosurfactants: Production and potential applications in the remediation of oil-contaminated sites	Eurasian Academy of Environmental Sciences Sub-Regional Science Centre - Karwar Karnataka	Karwar Karnataka	02/12/2023
16.	Dr. Lalit M. Pandey	Protein Aggregation	Gorakhpur University	Gorakhpur	17/12/2023
17.	Dr. Lalit M. Pandey	Biointerface Engineering and Biomaterials	The University of Turin, Italy	Turin, Italy	25/03/2024
18.	Prof. Latha Rangan	Role of Women in protecting the Ecosystem	NASI North East Local Chapter under	Online	02/05/2023
19.	Prof. Latha Rangan	Plastome mining of selected small genome sized plants	CSIR, NIIST	Trivandrum	28/11/2023
20.	Prof. Latha Rangan	Mining renewable energy resources- rendezvous with Karanj.	AIST, Tsukuba	Japan	11/03/2024
21.	Prof. Latha Rangan	Zingiberaceae exploration	Gauhati University	Guwahati	07/02/2024



22.	Lingaraj Sahoo	Host Plant induced Gene Silencing – Tool to fight pathogen and climate adversities.	Hands on Workshop on Molecular Approaches to assess Toxicity and Stress in Biological samples” Organized by Department of Botany, Zoology and Biotechnology under DST-PURSE program	Guwahati	20/02/2024
23.	Lingaraj Sahoo	Gene Silencing – Tool to fight pathogen and climate adversities	“Refresher Course in Biosciences” By Malaviya Mission Teacher Training Centre (MMTTC), Utkal University	Bhubaneswar	23/02/2024
24.	Lingaraj Sahoo	Panel discussion on “Transforming Higher Education through Indo-Japan Collaboration	Japan-NER Bioeconomic Technology Cooperation Symposium 2024 (“JNBTCs 2024”) co-organized by Gifu University, Japan, and Indian Institute of Technology, Guwahati	IIT Guwahati	04/03/2024
25.	Lingaraj Sahoo	Gene Silencing – Tool to fight pathogen and climate adversities	National Seminar on Recent Advances in Plant Science for Sustainable Development” at Utkal University	Bhubaneswar	30/03/2024
26.	Prof. Rakhi Chaturvedi	Totipotency and regeneration in tissue cultures of plants: An Engineering Consideration for Enhanced Metabolite Production	Lovely Professional University	Punjab, India	April 20-21, 2023
27.	Prof. Rakhi Chaturvedi	Bioprocessing and plant cell culture technology for mass production of essential metabolites	Society for In Vitro Biology (SIVB)	Norfolk, Virginia, USA	June 14, 2023
28.	Prof. Rakhi Chaturvedi	Totipotency and regeneration in tissue cultures of plants for Enhanced Metabolite Production	Central University of Jammu	Jammu, UT of J&K	July 14-15, 2023
29.	Prof. Rakhi Chaturvedi	Refresher Course in Bioscience through virtual mode	Banaras Hindu University	Varanasi, India	December 06-19, 2023
30.	Prof. Rakhi Chaturvedi	Cellular totipotency favoring large scale sustainable plant propagation	Gauhati university	Guwahati, India	February 09, 2024

31.	Prof. Rakhi Chaturvedi	Plant improvement by utilizing plant tissue culture techniques	Gauhati university	Guwahati, India	February 09, 2024
32.	Prof. Rakhi Chaturvedi	Plant cell culture techniques for sustainable production of plant biomass and secondary metabolites	Pondicherry university	Puducherry, India	February 16, 2024
33.	Prof. Rakhi Chaturvedi	A next generation approach for medicinal metabolite production at commercial scale in Bioreactor	IIT Guwahati	Guwahati, India	March 4, 2024
34.	Prof. Rakhi Chaturvedi	Cellular Totipotency – A Sustainable Approach to Large Scale Plant Propagation	Chaudhary Charan Singh Haryana Agricultural University (CCSHAU)	Hisar, Haryana, India	March 22-30, 2024
35.	Prof. Rajaram Swaminathan	Looking at proteins using spectroscopy	Assam Don Bosco University	Kamarkuchi, Sonapur 782402	9/10/23
36.	Prof. Rajaram Swaminathan	Alumni Lecture Series	Agurchand Manmull Jain College	Meenambakkam, Chennai 600 061	22/12/23
37.	Dr. Selvaraju Narayanasamy	Technical session speaker in “Technological Innovation for Environmental Sustainability ‘24”	National Institute of Technology, Calicut	Calicut	03/02/2024
38.	Dr. Selvaraju Narayanasamy	Technical session speaker in “Innovating Environmental Protection: Integrating Cutting-Edge Chemical Engineering Practices for Sustainable Futures”	Hindusthan College of engineering and technology	Tamil Nadu	01/03/2024
39.	Dr. Selvaraju Narayanasamy	Resource person for Faculty Development Programme on “Advancement in Biotechnology and Chemical Engineering”	Vel Tech High Tech	Chennai	12/01/2024
40.	Dr. Shirisha Nagotu	Insights into the role of the conserved GTPase domain residues T62 and S277 in yeast Dnm1	Cold Spring Harbor Asia Conference	Matsue, Japan	13/10/2023
41.	Dr. Shirisha Nagotu	Women in STEM: bridging the gap	National institute of education planning and administration and IIT Guwahati	IIT Guwahati	06/03/2024
42.	Prof. Vibin Ramakrishnan	SDG 7: Affordable and Clean Energy for all	HFN Hyderabad	Hyderabad	02/05/2023
43.	Prof. Vibin Ramakrishnan	Peptide based Drug delivery - ‘Drawing board to bed side’.	Elsevier & NIPER Kolkata	Kolkata	06/10/2023
44.	Prof. Vibin Ramakrishnan	Idea to Innovation: Development of Protein	DBT-Bioinformatics Centre, Punjabi University, Patiala	Patiala	31/10/2023

		Engineering Tools for Drug Discovery			
45.	Prof. Vibin Ramakrishnan	Tools for Molecular Design and Activity Profiling; A reductionist approach	Vellore Institute of Technology, Vellore	Vellore, Tamilnadu	24/11/2023
46.	Prof. Vibin Ramakrishnan	Functional Programming of Peptide-based Delivery Vehicles Encoding Surface Electrostatics	University of Nice, France	Nice, France	12/12/2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
1.	Prof. Saptarshi Mukherjee)	Department of Chemistry, Indian Institute of Science Education and Research Bhopal, Madhya Pradesh	Applications of Luminescent Metal Nanoclusters in Biological Systems	24/04/2023	
2.	Prof. K. Yamauchi	Gifu University	Bioactivity of components from medicinal plants	14/09/2023	
3.	Prof. Jose Gadea Vacas	University of Valencia	1. Understanding the role of flavonoids in seed development and seed longevity. 2. Understanding the impact of parental environment on seed longevity.	18-27/02/2024	Visit under KA107 Erasmus Mundus Exchange Programme in the Applied Biodiversity Lab
4.	Prof. Eduardo Cortón	University of Buenos Aires	A glimpse on Argentina and bioanalytical research in LABB at the University of Buenos Aires and CONICET	07/02/2024	Visit as an Adjunct Professor

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1.	Lalit M. Pandey	National conference of Gau-Vigyan in modern life and medical science (NCGV 2023)	Ayush, SERB, DSIR, NECTAR, NEDFi and others	20-21/05/2023	National	250
2.	Lalit M. Pandey	Sri Aurobindo International Youth Conference (SAIYC)	Auroville Foundation	25/02/2024	National	150

3.	Lingaraj Sahoo	Japan-NER Bioeconomic Technology Cooperation Symposium 2024 ("JNBTCs 2024") co-organized by Gifu University, Japan, and Indian Institute of Technology Guwahati	MEXT, Japan	3–5th March, 2024	International	250
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## AWARDS AND HONOURS

- Prof. B. Anand: S. Ramachandran National Bioscience Award for Career Development; Department of Biotechnology, Ministry of Science and Technology, GoI.
- Prof. Kannan Pakshirajan: Oral Presentation in ChemEEE-2024; Indian Institute of Petroleum and Energy Visakhapatnam, Andhra Pradesh.
- Dr. Lalit M. Pandey: Fellow, Eurasian Academy of Environmental Science (FEAES);
- Dr. Lalit M. Pandey: Outstanding Achievement Award-2023; Agricultural & Environmental Technology Development Society (AETDS).
- Prof. Rakhi Chaturvedi: Advisory Committee Member; Japan-NER Bioeconomic Technology Cooperation Symposium 2024 ("JNBTCs 2024").
- Prof. Rakhi Chaturvedi: National Advisory Committee Member; Academia-Industry Interface for Promoting Entrepreneurship in Medicinal and Aromatic Plants 2023.
- Prof. Rakhi Chaturvedi: National Advisory Committee Member; 45<sup>th</sup> Annual Meeting of Plant Tissue Culture Association (India) & National Symposium on Recent Advances in Plant Biotechnology (RAPB - 2024).
- Dr. Shirisha Nagotu: International travel grant; DST-SERB-ITS.
- Prof. Vibin Ramakrishnan: FRSC. Fellow, Royal Society of Chemistry; Royal Society of Chemistry, UK.
- Prof. Vibin Ramakrishnan: FRSB. Fellow, Royal Society of Biology, UK.

## STUDENTS' ACHIEVEMENTS

- Mr. Ardhendu Mandal: Best Poster Award; 92<sup>nd</sup> Annual meeting of The Society of Biological Chemists (India): Biological Chemistry, Opportunities and Way forward (SBC 2023), BITS-Goa, India.
- Dr. Akanksha Bansal: Biotechnology Career Advancement and Re-Orientation Programme For Women Scientists (BioCARE); Department of Biotechnology, Ministry of Science and Technology, GoI.
- Dr. Akanksha Bansal: DBT-Research Associateship; Department of Biotechnology, Ministry of Science and Technology, GoI.
- Dr. Dipak Kumar Kanaujiya: Best Ph.D. Thesis Award 2023; IIT Guwahati.
- Ms. Naorem Bela Devi: Best Oral Presentation; NOET-2023, IIT (ISM) Dhanbad, Jharkhand.
- Mr. Rushikesh Fopase: Best Poster Award; National Conference on Gau Vigyan (NCGV 2023); IIT Guwahati.
- Mr. Anurag Mishra: Best Poster Award; National Conference on Gau Vigyan (NCGV 2023); IIT Guwahati.
- Ms. Shalini Prajapati: Best Poster Award; National Conference on Gau Vigyan (NCGV 2023); IIT Guwahati.
- Ms. Smrity Sonbhadra: Best Poster Award; National Conference on Gau Vigyan (NCGV 2023); IIT Guwahati.
- Ms. Mehak: Best Poster Award; National Conference-Condensed Matter Days (CMDAYS 2023); Tezpur University, Assam.
- Mr. Anurag Mishra: Best Oral Presentation Award; International Conference on Trends in Chemical, Energy and Environmental Engineering; Indian Institute of Petroleum Engineering (IPE) Vishakhapatnam.
- Ms. Shilpa Nandi: Best Oral Presentation Award; Conference on Trends in Chemical, Energy and Environmental Engineering; Indian Institute of Petroleum Engineering (IPE) Vishakhapatnam.

- Mr. Chinmaya Panda: Best Poster Award; 4<sup>th</sup> Student Indian Peptide Society (sIPS) Conference; Gujarat Biotechnology University, Gandhinagar, Gujarat.
- Ms. Rashmi Singh: Best Poster Award- Third Prize; CMS Vellore.
- Ms. Nuzelu and Mr Sonu: Finalist in Top 5 for the product BHEEMA; Vishwakarma Project; Maker Bhawan Foundation and WIN Foundation.
- Mr. Krishna Kant Pachauri: SERB-DST Travel Grant: Science and Engineering Research Board (SERB) - DST, Govt. of India.
- Mr. Mohammed Askkar: PMRF; Ministry of Education, Govt. of India.
- Mr. Ajithkumar V: PMRF; Ministry of Education, Govt. of India.
- Mr. Harish Kumar: ACS Best Short Invited Talk - 3<sup>rd</sup> position; International Hybrid Conference on Nano Structured Materials and Polymers (ICNP-2023).
- Mr. Jeevanantham S: Best Presentation Award (2<sup>nd</sup> place); International Conference on Waste, Energy and Environment – ICWEE-2023.
- Mr. Bharathwaj N: PMRF; Ministry of Education, Govt. of India.
- Ms. Deepa Mehta: PMRF; Ministry of Education, Govt. of India.
- Ms. Pooja Jatav: PMRF; Ministry of Education, Govt. of India.
- Ms. Shomina Dehury: PMRF; Ministry of Education, Govt. of India.
- Mr. Vishwa R: PMRF; Ministry of Education, Govt. of India.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
1.	B. Anand	Indian Institute of Technology Kanpur, Kanpur	Professor	RNA Biology, CRISPR Biology, Ribosome Biogenesis
2.	Bora Utpal	Institute of Genomics and Integrative Biology, Delhi	Professor	Biomedical Engineering, Biodiversity and Bio-entrepreneurship
3.	Bose Biplab	All India Institute of Medical Sciences	Associate Professor	Systems Biology, Cell signaling, Recombinant therapeutics
4.	Chanda Souptick	Indian Institute of Technology Kharagpur, India	Assistant Professor	Biomechanics, implant design & optimization, surgical simulation, biomedical image processing
5.	Chaturvedi Rakhi	University of Delhi, India	Professor	Plant Tissue Culture & Secondary Metabolites Production
6.	Chaudhary Nitin	CSIR-Centre for the cellular and Molecular Biology, Hyderabad	Professor	Peptide self-assembly and amyloid aggregates, Peptide-membrane interactions Curvature inducing proteins
7.	Das Debasish	Indian Institute of Technology Bombay	Professor	Metabolic engineering, Biochemical engineering, Modelling of fermentation process, Biofuel

8.	Dasu V. Venkata	Indian Institute of Technology Madras	Professor	Bioprocess Development, Metabolic Engineering
9.	Ghosh Siddhartha S.	Indian Institute of Chemical Biology (IICB), Kolkata	Professor	Cancer Therapeutics, Nanobiotechnology, Molecular Pathways Involving Drug Resistance and EMT
10.	Goswami Pranab	Gauhati University	Professor	Biosensors and Biofuel cells
11.	Goyal Arun	Indian Institute of Technology Kanpur, Kanpur, India.	Professor	Molecular Biology, Protein Engineering, Rational Enzyme Engineering, 3-Dimensional Structure (In silico, crystal and solution) and Function analysis of enzymes and their industrial (Biorefinery, therapeutic, food, Pulp and paper) applications.
12.	Gupta Navin	Brain Computer Interfaces and Neural Engineering (BCI-NE) Group, University of Essex	Assistant Professor	Imaging Genetics, Biomedical Signal/Image Processing, Multimodal Analysis, Computer Aided Diagnosis, Biomedical Instrumentation
13.	Jaganathan Bithiah G.	Johann Wolfgang Goethe University, Frankfurt, Germany	Professor	Stem Cell Biology, Cancer signaling
14.	Kanaujia Shankar Prasad	Indian Institute of Science Bangalore	Professor	Structural Biology and Bioinformatics Studies
15.	Kumar Manish	University of Maryland, College Park, USA	Professor	Molecular interaction of host-pathogen-vector of infectious diseases (vector-borne diseases of zoonotic importance), Gene expression analysis of Spirochete, Leptospira interrogans and Borrelia burgdorferi, Development of a vaccine against outer membrane proteins of Leptospira interrogans and Borrelia burgdorferi
16.	Kumar Sachin	University of Maryland, College Park, USA	Professor	Molecular biology of paramyxoviruses, flaviviruses
17.	Kunnumakkara A. B.	University of Calicut, Kerala	Professor	Role of inflammatory pathways in cancer development, Identification of novel biomarkers for cancer diagnosis and prognosis, Cancer drug discovery.
18.	Limaye Anil Mukund	Indian Institute of Science Bangalore	Associate Professor	Hormonal regulation of gene expression
19.	Maiti Soumen Kumar	Indian Institute of Technology Bombay	Associate Professor	Bioprocess Engg, Biofuel
20.	Mandal Biman B	Indian Institute of Technology Kharagpur	Professor	Regenerative Medicine, Biomaterials, Tissue Engineering, Stem Cells



21.	Nagotu Shirisha	University of Groningen, the Netherlands	Assistant Professor	Cell biology, Organelle biology, Cellular Ageing, Membrane dynamics
22.	Pakshirajan Kannan	IIT Madras	Professor	Environmental Biotechnology
23.	Pandey Lalit Mohan	Indian Institute of Technology Delhi	Associate Professor	Bio-interfaces and Biomaterials, Protein's adsorption and aggregation, Nanomaterials and composites for Biomedical applications, Environmental Chemical Engineering
24.	Patra Sanjukta	Central Food Technological Research Institute, Mysore	Professor	Enzyme and Microbial Technology; Biosensors; Metagenomics; Environmental Biotechnology
25.	Ramakrishnan Vibin	Indian Institute of Technology Bombay	Professor	Network medicine, Bio-Nano catalysis, Drug delivery vehicles
26.	Rangan Latha	University of Madras	Professor	Applied Biodiversity
27.	Sahoo Lingaraj	Maharshi Dayanand University, Rohtak, India	Professor	Plant Molecular Biology
28.	Saini Gurvinder Kaur	Andhra University, Visakhapatnam	Professor	Fungal Biotechnology, Engineering entomopathogenic fungi
29.	Satpati Priyadarshi	Indian Institute of Science Bangalore	Associate Professor	Classical molecular dynamics (MD) free energy simulation, Electronic Structure calculations that predict the structure, properties, reactivity, bonding etc. of small molecules
30.	Selvaraju Narayanasamy	Indian Institute of Technology Madras, India	Associate Professor	Environmental Biotechnology, Wastewater remediation, Microbial Biodiesel production, Advanced Oxidation Process
31.	Senthilkumar S	Central Leather Research Institute, Chennai	Professor	Bioprocess Analytical Technology (BioPAT), Metabolic Engineering
32.	Singh Kusum K	Institute of Molecular Medicine, Heinrich-Heine University of Duesseldorf, Germany	Assistant Professor	Genome Editing, Alternative Splicing, RNA Binding Proteins, posttranscriptional gene regulations, isoform switching, nonsense mediated RNA decay
33.	Swaminathan Rajaram	Tata Institute of Fundamental Research	Professor	Proteins, Spectroscopy, Biochemistry

34.	Tamuli Ranjan	CSIR-Centre for Cellular and Molecular Biology, Hyderabad (degree awarded by the Jawaharlal Nehru University, New Delhi)	Professor	Calcium and cell signaling, Genetics of the filamentous fungus <i>Neurospora crassa</i> , DNA repair
35.	Thummer Rajkumar P	University of Groningen, Groningen, The Netherlands	Assistant Professor	Stem Cell Engineering and Regenerative Medicine
36.	Trivedi Vishal	Central Drug Research Institute, Lucknow	Professor	Intracellular Signaling in <i>Plasmodium falciparum</i>

# Chemical Engineering

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 2002**

**ACADEMIC PROGRAMMES OFFERED:**

- Bachelor of Technology (B. Tech)
  - Chemical Engineering
- Master of Technology (M. Tech)
  - Petroleum Science and Technology (PST)
  - Material Science and Technology (MST)
  - Computer Aided Process Engineering (CAPE)
  - Food Science and Technology (FST)
- Doctor of Philosophy (Ph. D)

**LABORATORY FACILITIES**

- **Undergraduate Laboratories (Total Number): 6**

**Fluid Mechanics Lab**

Flow through Fluidized Bed, Centrifugal Pump Test Rig, Flow through Helical Coil, Nozzle Meter Test Rig, Packed Bed, Pitot Tube, Rotameter Test Rig, Drag Co-efficient Apparatus, Reynolds's Apparatus, Notch Tank Apparatus, Impact of Jet on Vane Apparatus, Reciprocating Pump Test Rig, Bernoulli Apparatus, Flow Meter Demonstration Rig, Energy Losses in Pipes, Energy Losses in Bends.

**Mechanical Operation Lab**

Ball Mill, Froth Floatation Cell, Hammer Mill, Roll Crusher, Plate and Frame Filtration, Rotary Drum Vacuum Filter, Vibrating Screen, Sieve Shaker, Cyclone Separator, Cyclone Scrubber, Elutriator, Sedimentation, Leaf Filter, RO membrane performance.

**Heat Transfer Lab**

Extended Surface Heat Exchanger, Tubular Heat Exchanger, Jacketed Vessel Heat Exchanger, Plate Heat Exchanger, Shell and Tube Heat Exchanger, Emissivity Measurement Apparatus, Composite Wall, Conductivity of Metal Rod, Calandria Evaporator, Vertical & Horizontal Condenser, Unsteady State Heat Transfer, Heat Transfer in Forced Convection, Multi Effect Evaporator.

**Mass Transfer Lab**

Bubble Cap Distillation Set Up, Packed Bed Distillation Set Up, Mass Transfer with and without Chemical Reaction, Liquid - Liquid Extraction in Packed Bed, Solid - Liquid Extraction in Packed Bed, Absorption in Packed Bed, Vapour in Air Diffusion, Rotary Drier, Forced Draft Tray Drier, Water Cooling Tower, Batch Crystallization, Fluidized bed dryer, Humidification and dehumidification setup.

**Process control Lab**

Two Tank Non-Interacting System, Two Tank Interacting System, Control Valve Characteristics, Temperature Control Trainer, Pressure Control Trainer, Flow Control Trainer, Level Control Trainer, Cascade Control Trainer, First-Order and Second-Order System, Multi Process Trainer, Multi Variable Control Trainer, PLC Trainer, Study of I-P and P-I Converter.

**Reaction Engineering Lab**

Packed bed reactor, Trickle bed reactor, RTD Studies in CSTR, RTD studies in plug flow reactor, Cascade CSTR, Spinning basket reactor, Isothermal batch reactor, RTD of Packed bed reactor, Combined flow reactor.

- **Postgraduate Laboratories (Total Numbers): 1**

### **Petroleum Lab**

Acidity and Alkalimetry, Aniline Point, Burning Test Lamp, Cloud & Pour Point, Flash & Fire Point, Melting Point Apparatus, Red Wood Viscometer, Reid Vapour Pressure, Smoke point, U-Tube Viscometer, ASTM Distillation, Kinematic Viscometer Bath, Drop Point Grease Apparatus, Burning Quality of Kerosene, Contamination Detector, Tar Viscometer, Softening Point Apparatus, Carbon Residue Apparatus, Bomb Calorimeter, Vapour–Liquid Equilibrium, Steam Distillation, Digital Penetrometer.

- **Other Laboratories (Total Numbers): 2**

### **Analytical Lab**

Atomic Absorption Spectrophotometer, Autotitrator, BET Surface Area Analyzer, Buchi Rheometer, Chemisorb Surface Area Analyzer, Differential Scanning Calorimeter, Digital Polarimeter, Ellipsometer, Fourier Transform Infrared Spectrophotometer, Gas Chromatography with TCD, FID, ECD Detector, Gas Chromatography with TCD, FID, PFD Detector, Gas Chromatography-Mass Spectroscopy, High Performance Liquid Chromatography, High Pressure Thermo Gravimetric Analyser (HPTGA), Interfacial Rheometer, Karl Fisher Titrator, Laser Particle Size Analyser, Mercury Intrusion Porosimeter, Microscope, Microwave Assisted Reactor, Millipore Water Purification, Refractometer, Rheometer, Spinning drop Tensiometer, Tensiometer, Thermogravimetric Analyzer, Time Resolved Stereoscopic Particle Image Velocimetry (PIV), Total Organic Content Analyzer, UV-Visible Spectrophotometer, X-Ray Diffraction, Zeta Potential

### **CoE-SusPol**

Centre of Excellence for Sustainable Polymers (CoE-SusPol) is funded by the Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilizers. The objective of CoE-SusPol is to develop cost effective and scalable technologies for the production of biodegradable polymer based end products using both petrochemical and renewable bio- feedstock and to establish state of the art facilities in biodegradable polymer areas. Both experimental and computational laboratory has been set up under this project facility and significant high-end equipments have been purchased in the department.

## **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

- Ultrapure water purification system (Milli Q & Ellix)
- Total Organic Carbon Analyser (Shimadzu)

## **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

### **Fluids**

- Design and development of micro-pumps and actuators
- Enhanced oil recovery
- Experimental and computational fluid dynamics
- Experimental and computational multiphase flows
- Field driven fluid flows

- Mechanics, patterns, and stability of fluids
- Micro- and nano-fluidic devices
- Minerals processing
- Multi scale bubble dynamics and applications
- Rheology of complex fluids
- Transport through meso-porous materials

### **Reaction Engineering**

- Catalysis electrolysis and Heterogeneous reactions
- Electrochemical corrosion
- Electroless plating
- Hydrocarbon processing
- Interfacial reactions
- Kinetic analysis
- Micro- and nano-fluidic reactors
- Non-equilibrium reactive systems
- Pyrolysis of waste plastics
- Separations with chemical reaction
- Sono-process engineering

### **Chemical Engineering Science**

- Biological physics
- Chemical mechanical polishing (CMP)
- Colloids and interfacial science
- Dewetting and phase separation
- Phase equilibria and thermodynamics
- Phase equilibria of ionic liquids
- Phase transition in polymers (nucleation, crystallization, collapse transition)
- Structure property relations
- Super-hydrophobic and self-cleaning surfaces

### **Environmental Pollution Control**

- Air pollution

- Biological wastewater treatment (biosorption, bioaccumulation, biodegradation, bioreduction, biotransformation)
- Electro remediation of water/wastewater
- Membrane bioreactors
- Physiochemical water/ wastewater treatment techniques
- Screening of novel microbial strains for treatment of organic/inorganic wastewater
- Sonolysis and sono-hybrid advanced oxidation techniques
- Treatment of industrial effluent
- Pollution trading

### **Process Systems Engineering**

- AI based optimization techniques
- Computational transport processes
- Deterministic, evolutionary and global optimization
- Material processing
- MEMS & NEMS
- Molecular simulation
- Optimization and control
- Planning and scheduling
- Process control
- Process design & techno-economics
- Process intensifications
- Process modelling
- Randomized algorithms
- Self-assembly and self-organization
- Soft lithography
- Statistical mechanics and thermodynamics

### **Materials Engineering**

- Bio-lubricant
- Complex organic solids
- Functional multiscale structures & composites
- Graphene synthesis and application



- Ionic liquids
- Liquid crystalline materials
- Low cost ceramic membranes
- Micro and nano sensors
- Non Newtonian fluids
- Palladium membranes
- Reactive systems and gels
- Responsive materials for environmental, biological and chemical separation
- Self-healing surfaces
- C-C composites and C-Polymer composites

### **Polymer Science and Engineering**

- Polymers synthesis and characterization
- Polymer reaction engineering
- Polymer processing
- Polymer rheology
- Polymer solutions and thermodynamics
- Polymer simulation and computing
- Polymer based nano and bio composites
- Polymer degradation
- Polymer and nano-material migration studies
- Polymer recycling and reuses
- Biodegradable polymers
- Polymer based technology development, licensing, training and entrepreneurship
- Biodegradable polymers and bio based nanocomposites

### **Energy Engineering**

- Artificial photosynthesis
- Biofuels: biodiesel, bioethanol, bio butanol, bio hydrogen and bio oil
- Biomass gasification and pyrolysis
- Carbon dioxide capture and conversion to fuel
- Clean coal technology
- Combustion and gasification reaction kinetics

- Fischer-Tropsch synthesis
- Fuel cells
- Hydrogen production and storage
- Utilisation of lignocellulosic biomass for fuel/chemicals
- Solar cells
- Nuclear reactor
- Membrane reformer for hydrogen production

### **Separation and Mixing Processes**

- Adsorption
- Bio-separation
- Membrane separation processes
- Micro-mixers & separators
- Post CMP cleaning
- Separation using supercritical fluids
- Surfactant mediated separation processes

### **Food Science and Technology**

- Food Processing
- Food packaging
- Membrane technology based juice processing
- Drying technologies (RWD, Tray and Oven) for food product development from North-East horticulture resources
- Microwave assisted food processing
- Functional foods
- Extraction of bioactive compounds and their applications in food product development
- Nutritionally rich low cost food products

## **MAJOR INITIATIVES AND BREAKTHROUGHS IN RESEARCH AND DEVELOPMENT**

- The development of novel, nature-inspired vertically aligned nanomaterials (VANs) of metal oxide on FTO substrates has yielded a significant breakthrough in electrochemical-based sensing of agriculture pesticides. This innovation eliminates the need for intensive chemical usage, thereby enhancing environmental sustainability. Additionally, novel nature-inspired nanocomposites provided valuable insights in the photo-reduction of CO<sub>2</sub> to some value-added products.

- Developed a single step process to produce green hydrogen and stabilized bio-oil simultaneously from lignocellulosic biomass and the same has been patented (granted).

#### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: INTERNATIONAL, NATIONAL

Sl. No.	Name of Faculty	Name of Conference/Workshop	Place	Date	International/National
1	Nishan Chaudhury and G. Pugazhenth	"Effect of inexpensive pore-forming agents on the physical characteristics of kaolin-based tubular membranes", Chemference 2023	BITS Pilani, India	14-10-2023	International
2	S. Acharya and N. Kishore	"Investigation of The Effects of Temperature Variation On Liquefaction of Citrus Fruit Wastes", Chemference 2023	BITS Pilani, India	01-10-2023	International
3	P.K.R. Annapureddy and N. Kishore	"Kinetics and Thermodynamics of Co-Pyrolysis of Polyalthia Longifolia and Polypropylene Grocery Bags Waste", Chemference 2023	BITS Pilani, India	01-10-2023	International
4	Somthirto Santra and Tamal Banerjee	"Molecular Modelling studies on Deep Eutectic Solvents as Novel Separation Media for Aromatic Extraction", 38th International Conference on Solution Chemistry (38 ICSC), Belgrade, Serbia	Belgrade, Serbia, IUPAC	12-07-2023	International
5	B.V. Muppidathi, S. Laporte, Y. Ulanowski, S. Subbiah, B. Lebental	"Performance of a Multiparametric Water Quality Sensor in a Small-Scale Water Distribution Network", IEEE SENSORS	IEEE SENSORS	29-10-2023	International

6	Nabendu Paul, Nikhil Kumar and Tamal Banerjee	"Quantum Chemical and Molecular Dynamics Insights in the Extraction of Aromatic moieties from Hydrocarbon and Aqueous Stream using Eutectic Solvents", Invited Talk at University of Twente, Netherlands	University of Twente, Netherlands	05-07-2023	International
7	G. Ahmed and N. Kishore	"Thermogravimetric Analysis of Erythrina Indica Biomass: Insights into The Kinetics of Heat Treatment Through Pyrolysis", Chemference 2023	BITS Pilani, India	01-10-2023	International
8	Nanda Kishore	"Investigation of The Effects of Temperature Variation On Liquefaction of Citrus Fruit Wastes", Chemference 2023	BITS Pilani, Goa	10-02-2023	National
9	Nanda Kishore	"Kinetics and Thermodynamics of Co-Pyrolysis of Polyalthia Longifolia and Polypropylene Grocery Bags Waste", Chemference 2023	BITS Pilani, Goa	10-02-2023	National
10	Nanda Kishore	"Thermogravimetric Analysis of Erythrina Indica Biomass: Insights into The Kinetics of Heat Treatment Through Pyrolysis", Chemference 2023	BITS Pilani, Goa	10-02-2023	National
11	Anugrah Singh	10 <sup>th</sup> International and 50 <sup>th</sup> National Conference on Fluid Mechanics and Fluid Power FMFP 2023	IIT Jodhpur	20-12-2023 – 22-12-2024	International

12	Anugrah Singh	27 <sup>th</sup> National and 5 <sup>th</sup> International Heat and Mass Transfer Conference IHMTC 2023	IIT Patna	14-12-2023 – 17-12-2023	International
13	Animes Kumar Golder (Attend by: Pramod M Gawal)	Density Functional Theory Modeling of Materials (DFT-M) (Workshop)	Center for Advanced Computational Studies, Delhi (online mode)	07-09-2023 – 13-09-2023	National
14	Animes Kumar Golder	IChE - CHEMCON 2023	Kolkata, India	27-12-2023 – 30-12-2023	International
15	Animes Kumar Golder (Presented by: Chandra Bhan)	IChE - CHEMCON 2023	Kolkata, India	27-12-2023 – 30-12-2023	International
16	Animes Kumar Golder (Presented by: Pramod M Gawal)	International Conference on Advanced Nanomaterials & Nanotechnology (ICANN)	IIT Guwahati, Assam	29-11-2023 – 01-12-2023	International
17	Animes Kumar Golder (Presented by: Pramod M Gawal)	International Conference on Petroleum, Hydrogen, & Decarbonization (ICPHD)	IIT Guwahati, Assam	03-11-2023 – 05-11-2023	International
18	Animes Kumar Golder	International Conference on Renewable Energy and Environment Engineering 2023	Brest, France	23-08-2023 – 25-08-2023	International
19	Animes Kumar Golder (Presented by: Chandra Bhan)	Research & Industrial Conclave (RIC)	IIT Guwahati, India	14-05-2023 – 16-05-2023	National
20	Animes Kumar Golder (Presented by: Kartik Mehta)	Research & Industrial Conclave (RIC)	IIT Guwahati, India	14-05-2023 – 16-05-2023	National
21	Animes Kumar Golder (Attend by: Pramod M Gawal)	Scientific Writing using LaTeX (Workshop)	IIT Guwahati, Assam	09-09-2023 – 10-09-2023	National
22	Kaustubha Mohanty	PyroAsia 2023	Kuala Lumpur, Malaysia	26-28 June 2023	International

23	Vaibhav V Goud	PyroAsia 2023	Kuala Lumpur, Malaysia	26-28 June 2023	International
24	Pankaj Tiwari	PyroAsia 2023	Kuala Lumpur, Malaysia	26-28 June 2023	International
25	Kaustubha Mohanty	Frontiers in Analytical and Applied Pyrolysis for Energy and Environment 2024	IIT Madras, India	26-27 Feb. 2024	International
26	Kaustubha Mohanty	International Symposium on Feedstock Recycling of Polymeric Materials (ISFR2023)	Sendai, Japan	06-08 Nov, 2023	International
27	Kaustubha Mohanty	1st International Conference on the Practical Zero Emissions Technologies and Strategies (PZETS 2023)	Ho Chi Minh City, Vietnam	09-12 December, 2024	International
28	Kaustubha Mohanty	3rd International Conference on Nanomaterials in Biology	IIT Gandhinagar, India	19-22 Nov, 2023	International
29	Kaustubha Mohanty	4th International Conference on Recent Advances in Bio-Energy Research (ICRABR 2023)	NIBE, Kapurthala, India	9-12 October, 2023	International
30	Kaustubha Mohanty	Advanced Materials and Characterizations	Mumbai	April 25-27, 2023	National
31	Kaustubha Mohanty	5th International Symposium on Materials, Electrochemistry and Environment (CIMEE 2023)	Lebanon	September 21– 23, 2023	International
32	Pankaj Tiwari	1st International Conference on the Practical Zero	Ho Chi Minh City, Vietnam	09-12 December, 2024	International

		Emissions Technologies and Strategies (PZETS 2023)			
33	Anugrah Singh	Symposium on Emerging Technologies and Future Trends in Chemical Engineering	IISc Bangalore	24/06/2023	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Dipankar Bandyopadhyay	Multiphase Systems under Electric Field: from 'Kissing' to 'Threading'	University of Bordeaux	Nouvelle-Aquitaine, France	Jun-23
2	Dipankar Bandyopadhyay	Laws and Limits, Research Conclave	IIT Guwahati	Guwahati	May-23
3	Kaustubha Mohanty	Microalgae based Biorefinery with Circular Bio-economy	Kuvempu University	Karnataka	20-03-2024

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Date	International/National
1	Pankaj Tiwari, Sumit Kumar, Abhijit Kakati	International Conference on Petroleum, Hydrogen & Decarbonization (ICPHD 2023)	03-05 November, 2023	International
2	Anugrah Singh, Sumit Kumar	QIP Short Course cum Workshop on "Enhanced Petroleum Recovery Processes – Priorities, Challenges, and Opportunities" by Prof. Hemanta Sarma, University of Calgary	30th October to 2nd November 2023	National

#### AWARDS AND HONOURS

- Prof. Kaustubha Mohanty: Fellow; International Association of Advanced Materials.
- Prof. Nanda Kishore: Editor's Pick Article; Journal of Renewable and Sustainable Energy.



## STUDENTS ACHIEVEMENTS

- Nikhil R. Dhongde: The Best Oral Presentation (Technical) certificate; 3rd International Conference on New Frontiers in Chemical, Energy and Environmental Engineering (INCEEE - 2023), November 24 - 25, 2023, NIT Warangal, Telangana.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute /Org PhD degree received from	Designation	Areas of Interest
1	Anandalakshmi R.	IIT Madras	Associate Professor	Computational Heat Transfer and Fluid Flow, Process Modelling and Simulation, Solar Thermal Energy Conversion, Energy Efficient Design of Thermal Systems
2	Bandyopadhyay Dipankar	IIT Kanpur	Professor	Colloid and Interfacial Phenomena, Computational Fluid Dynamics, Micro and Nano Fluidics, Complex Flow and Fluids, Clean Energy– Fuel and Solar cells
3	Banerjee Tamal	IIT Kanpur	Professor	Phase equilibria of ionic liquids, Molecular simulations, Global optimisation, Statistical thermodynamics
4	Das Chandan	IIT Kharagpur	Professor	Wastewater Treatment, Bioremediation, Membrane based Separation Process
5	Dasmahapatra Ashok Kumar	IIT Bombay	Professor	Complex fluids, Phase transition in polymers (Nucleation, crystallization, collapse transition, etc.), Structure-property relations, Molecular simulations, Biological physics
6	De Mahuya	IIT Kanpur	Professor	Catalysis and reaction engineering, adsorption, hydrocarbon processing
7	Deshmukh Omkar Suresh	University of Twente, Netherlands	Assistant Professor	Colloids & Interfaces, Flow of Complex fluids, Polymer Dynamics, Glassy systems, Food oral processing, Food Physics, Bio-materials, Biophysics.
8	Ghosh Pallab	IIT Bombay	Professor	Interfacial phenomena, Interfacial reactions, Membrane separation, Randomised algorithms

9	Ghoshal Alope Kumar	IIT Kharagpur	Professor	Advanced Separation Technology, Modelling & Simulation, Environmental Pollution Control, Pyrolysis of waste plastics
10	Gooh Pattader Partho Sarathi	Lehigh University	Associate Professor	Stochastic dynamics, Colloid and Interface science, Tribology, Soft matter
11	Golder Animes Kr.	IIT Kharagpur	Professor	Photocatalytic water treatment and water-splitting; Nanoparticles for water purification and sensor development; Electro-and bio-remediation of heavy metals; Advanced oxidation processes; Physiochemical water treatment techniques; CO2 reduction
12	Goud Vaibhav V.	IIT Kharagpur	Professor	Heterogeneous Reactions, Bio-energy and Green Engineering, Biolubricant, Utilisation of Lignocellulosic Biomass for Fuel/Chemicals, Supercritical Fluids
13	Gupta Raghvendra	The University of Sydney, Australia	Associate Professor	Biofluid Mechanics, Multiphase Flows, Microfluidics, Experimental and computational fluid dynamics
14	Kakati Abhijit	Indian Institute of Technology Madras	Assistant Professor	Rock-fluid interaction; Chemical enhanced oil recovery, Smart water flooding, Geo-storage of CO2
15	Katiyar Vimal	IIT Bombay	Professor	Synthetic and Natural Polymers, Polymer Processing, Biothermoset, Nanobiocomposite, Organic Solar Cells, Biodegradable Polymers, Energy
16	Kishore Nanda	IIT Kanpur	Professor	Biofuels (Experimental and Computational Studies), Density Functional Theory Applied to Biofuels, Computational Transport Phenomena of Bubbles, Drops and Particles, Transport Phenomena of Non-Newtonian Fluids
17	Kotecha Prakash	IIT Bombay	Associate Professor	Optimization, Process Control, Artificial Intelligence, Planning and Scheduling
18	Kumar Amit	University of Delaware, USA	Associate Professor	Polymers and Polymer Nanocomposites, Molecular Modelling and Simulation, Gas Separation in Porous Materials

19	Kumar Sumit	ISM Dhanbad	Assistant Professor	Flow through porous media, Modelling and Simulation, Adsorption, Pyrolysis, EOR
20	Mandal Bishnnupada	IIT Kharagpur	Professor	Separations with chemical reaction, Molecular based membrane separation, Modelling and simulation of separation processes, Environmental pollution control
21	Mandal Tapas K	IIT Kharagpur	Professor	Multiphase flow & Measurement in multiphase flow, Bio-diesel
22	Mazumdar Subrata Kumar	IIT Kharagpur	Professor	Petroleum Science & Technology, Multiphase flow and reactor development, Hydrodynamics in multiphase flow, Mineral processing, Process intensifications, Micro-nano bubble science and technology and its applications, Waste water treatment, Microchannel-based extraction, Jet driven gas-aided extraction
23	Mohanty Kaustubha	IIT Kharagpur	Professor & Head of the Department	Biofuels, Biomass pyrolysis, Biological wastewater treatment, Heterogeneous catalysis, Microalgae bio refinery, Membrane based separations, Ionic liquid based separations, Waste management.
24	Moholkar Vijay S.	University of Twente, Netherlands	Professor	Bubble dynamics, CFD, Sono-process engineering, Bio-mass gasification
25	Peela Nageswara Rao	IIT Kanpur	Professor	Heterogeneous Catalysis and reaction engineering, Biomass conversion to value added chemicals, Bio-oil upgradation to transportation fuels, Carbon dioxide activation to valuable chemicals, Metal encapsulated zeolites
26	Prabu Vairakannu	IIT Madras	Professor	Clean Coal Technology, Combustion and Gasification, Reaction kinetics
27	Pugazhenth G.	IIT Kanpur	Professor	Membrane Separation, Polymer Nanocomposites, Nanomaterials, Catalysis & Refinery Processes
28	Purkait Mihir Kumar.	IIT Kharagpur	Professor	Membrane technology; Effluent treatment and waste management; Advanced separation processes; Catalysis; Nanoparticles and nanocomposites; Bio-diesel; Bio-products, vegetable and fruit juice

				processing; CO <sub>2</sub> to products and liquid fuels.
29	Saha Prabirkumar	IIT Madras	Professor	Process Modelling, Optimisation and control, Membrane Based separation Process
30	Senthilmurugan S	IIT Delhi	Professor	Modelling and Optimization of Novel Processes, Process Design and Operation of Membrane Separation Processes, Waste and waste water treatment (WWWT) for Process Industries, Novel Desalination Technologies, Smart Water Grid, Waste to Energy
31	Singh Anugrah	IISc Bangalore	Professor	Computational and Experimental Fluid Dynamics, Microfluidics/Nanofluidic, Material Processing, Flow through Porous Media
32	Tiwari Pankaj	University of Utah, Salt Lake City, UT, USA	Professor	Conventional and unconventional energies, Reservoir Engineering, Complex organic solids, Biomass conversion, Pyrolysis process, Kinetic analysis
33	Uppaluri Ramgopal V. S.	UMIST, Manchester, UK	Professor	Food Processing, Extraction of bioactive compounds and their applications in food product development, polymeric hydrogel fabrication, nutritionally rich low cost food products, membrane science and technology, functional adsorbent synthesis, wastewater treatment
34	Venkatesh R. Prasanna	IIT Madras	Associate Professor	Electrochemistry, Chemical Mechanical Polishing (CMP), Post CMP cleaning, Refinery Processes

# Chemistry

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 1995**

**ACADEMIC PROGRAMMES OFFERED:**

(i) **B. Tech. Core (Theory and Laboratory) and Elective courses in Chemistry**

(ii) **B. Tech. in Chemical Science & Technology**

(iii) **M. Sc in Chemistry**

(iv) **Ph. D**

**LABORATORY FACILITIES**

<b>Sr. No.</b>	<b>Details of Laboratory</b>	<b>Number</b>	<b>Approx. Floor space (m<sup>2</sup>)</b>	<b>Availability of facilities like board, LCD, PC/Laptop, AC, internet</b>
<b><u>Laboratories for B. Tech and M. Sc program</u></b>				
01	Chemistry Laboratory (B. Tech, 1 <sup>st</sup> sem) / Chemical Technology Lab – I, B. Tech (CST)	01	200	White board, PC, internet, phone
02	Chemical Technology Lab – II, B. Tech (CST)	01	140	White board, PC, internet, phone
03	Chemical Technology Lab – III, B. Tech (CST) / Physical Chemistry Lab (M. Sc)	02	300	White board, PC, internet, phone
04	Inorganic Chemistry Lab (M. Sc) / Organic Chemistry Lab (M. Sc)	01	180	White board, PC, internet, phone
<b><u>Research Laboratories:</u></b>				
05	CHL –101, CHL – 102, CHL –103, CHL – 104, CHL –105, CHL –106, CHL – 201, CHL-202, CHL-203, CHL-204, CHL – 205, CHL – 206, CHL-3201, CHL-3202, CHL-3203, CHL-3204, CHL-3207, CHL-3209, CHEL-004, CHEL-005, CHEL-006, CHEL –101, CHEL –102, CHEL –103, CHEL – 104, CHEL – 105, CHEL – 106, CHEL –107, CHEL –108, CHEL – 109, CHEL –201, CHEL –202, CHEL –203, CHEL – 204, CHEL – 205, CHEL – 206, CHEL –207, CHEL –208, CHEL – 209, CHEL –301, CHEL –302, CHEL –303, CHEL – 304,	48	80 (average)	White board, computers, internet, phone, Fume hoods, Centralized AC

	CHEL – 305, CHEL – 306, CHEL –307, CHEL –308, CHEL – 309.			
06	Analytical equipment Lab I – VI	06	540	phone, computers, internet, AC
07	Computer Lab	02	80	phone, computers, internet, AC
08	Ultrapure (Milliipore) water Lab	01	50	AC

## MAJOR EQUIPMENT AND FACILITIES ACQUIRED

- (1) GC MS System, Make: Agilent Technologies, Model: G7082CW, PO Date: 01.12.2023
- (2) Ice Flacking Machine, 100 Kg Capacity (02 Nos.), Make: Wensar Labman, Model: LMIF-100
- (3) Ice Flacking Machine, 50 Kg Capacity (01 No.), Make: Wensar Labman, Model: LMIF-50
- (4) Installation of Laboratory furniture

## MAJOR AREAS OF RESEARCH AND DEVELOPMENT

The Department is engaged in various research and Development activities such as:

Catalysis, Supramolecular Chemistry, Nanoscale Science and Technology, Synthesis, structure and reactivity of Inorganics, Newer reagents, Protocols and Newer methodologies, Synthesis of natural products and Carbohydrate Chemistry, Bio-organic Chemistry, Bio-inorganic Chemistry and Co-ordination Chemistry & Organometallics, Chiral recognition using metal complex based host, Metal removal from wastewater using polymer based chelators, Polymer synthesis, Organic Photochemistry, Molecular dynamics, Quantum Molecular dynamics, Physical Chemistry – Spectroscopic and Theoretical investigations on Novel Materials, peptide chemistry, Development of new theoretical approaches to: Laser Assisted Control of Chemical Reactions, and, Resonances in Electron – Molecule Scattering, Biomimetic Chemistry and Chemical Biology, Computational Biophysics and Chemistry, Oxidation Catalysis, Molecular Magnetism, Synthesis of Single-Molecule Magnets (SMMs), MRI Contrast agents, Water Oxidation Chemistry, Experimental & Theoretical Physical Chemistry, Self-organization and Nonlinear dynamics, Liquid crystals, Functional Materials, Molecular Electronics, Self Assembly, Supramolecular dynamic aggregates, peptides, lipids, Time Resolved Absorption and Fluorescence Spectroscopy, SHG, MUPPETS, Synthetic organic chemistry, Natural product synthesis with the emphasis of new synthetic methodology; development of new reactions, asymmetric organocatalysis and transition metal catalysis with new catalyst design; mechanistic study, solar fuel from water, Gas/Vapor/Liquid Adsorption and Catalytic Applications of Metal-Organic Frameworks (MOFs), Peptidomimetics: Synthesis, Conformation and Biological activity, Nanofluidics, Organometallic Chemistry and Catalysis, Drug Delivery, Open Microfluidics, Chemical Sensor, Organofluorine Chemistry, Development of Catalysts for Electrochemical CO<sub>2</sub> Reduction; Synthesis of MRI Contrast Agents; Homogeneous Bio-inspired Catalysis; Spintronic Materials for Artificial Intelligence etc.



## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

### Major Initiatives in R&D:

Development of novel methods for the construction of diverse organic molecules those are of important in biological and medicinal sciences, Development of novel strategies for C-H activation for the regioselective carbon-carbon and carbon-heteroatom bonds formations, which are important in academia and chemical industries from both environmental and economic standpoint, Development of novel materials for water harvesting, Design of catalysts to transfer waste to chemicals, Supramolecular chemistry of polypeptides which are important in drug delivery and nanotechnology, Design and development of novel approaches for the development drugs for misfolding diseases, such as Alzheimer's disease (AD) and Parkinson's disease etc. Development of atom economic routes for the construction of novel molecules which are important in pharmaceuticals, materials chemistry such as construction of devices etc.,

### Breakthrough Innovations:

During the period under report, all the faculty members and students of the department have been engaged in various research activities in the form of training or in the form of R & D work. The main areas of research in the department include Catalysis, Supramolecular Chemistry, Nanoscale Science and Technology, Synthesis, structure and reactivity of Inorganics, Newer reagents, Protocols and Newer methodologies, Synthesis of natural products and Carbohydrate Chemistry, Bio-organic Chemistry, Bio-inorganic Chemistry and Co-ordination Chemistry & Organometallics, Polymer synthesis, Organic Photochemistry, Molecular dynamics, Quantum Molecular dynamics, Physical Chemistry – Spectroscopic and Theoretical investigations on Novel Materials, peptide chemistry, Development of new theoretical approaches to: Laser Assisted Control of Chemical Reactions, and, Resonances in Electron – Molecule Scattering, Biomimetic Chemistry and Chemical Biology, Computational Biophysics and Chemistry etc.

There are some salient research achievements observed in the ongoing research and development under institutional and sponsored research projects which has appeared in reputed peer-reviewed journals and newspapers recently in various fields of chemistry as mentioned below,

- Development novel *catalyst* to produce Sustainable Green Hydrogen fuel along with high market demand formic acid as by product.
- Development of efficient catalysts for transforming industrial waste into valuable chemicals etc.

### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
01	Prof. Bhisma K Patel	Recent Trends in Chemical Sciences (RETICS-2024),	Department of Chemistry, Sambalpur University, Jyoti Vihar,	02/03/2024	National
02	Prof. Bhisma K Patel	Recent Trends in Chemical Sciences and Technology (RETCST-2024),	Department of Chemistry, IIT Patna, March 1-2, 2024.	02/03/2024	National

03	Prof. Bhisma K Patel	Frontiers in Sustainable Catalysis,	Department of Chemistry University of Delhi	20/01/2024	National
04	Prof. Bhisma K Patel	International Conference on Organic and Medicinal Chemistry (ICOMC-2023),	Department of Chemistry, National Institute of Technology Warangal	29/06/2023	National
05	Prof. Manabendra Ray	6th Symposium on Advanced Biological Inorganic Chemistry (SABIC-2024)	Kolkata	7-11 <sup>th</sup> /1/2024	International
06	Prof. Aditya Narayan Panda	TCS 2023	IIT Madras	07-10 Dec, 2023	International
07	Prof. Aditya Narayan Panda	SDSS- 2023	IACS Kolkata	05-08, October, 2023	International
08	Prof. Aditya Narayan Panda	CRSI-NSC 2023	NIT Rourkela	06-08 July, 2023	International
09	Prof. Aditya Narayan Panda	SDMC 2024	Kaziranga, Assam	22-25 February, 2024	International
10	Dr. Manabendra Sarma	Radiation Damage to Genetic Material (RDGM) 2023	Indian Institute of Technology (IIT) Bombay, Mumbai, Maharashtra, India	04/07/2023 – 05/07/2023	National (Invited Talk)
11	Dr. Manabendra Sarma	Structure and Dynamics: Spectroscopy and Scattering (SDSS-2023)	Indian Association for the Cultivation of Science (IACS), Kolkata, India	05/10/2023 – 08/10/2023	National (Chair)
12	Dr. Manabendra Sarma	26th International Workshop on Quantum Systems in Chemistry, Physics, and Biology (QSCP-XXVI)	Jaipur, Rajasthan, India	14/10/2023 – 20/10/2023	International (Invited Talk)
13	Dr. Manabendra Sarma	Theoretical Chemistry Symposium (TCS) 2023	Indian Institute of Technology (IIT) Madras, Chennai, India	07/12/2023 – 10/12/2023	National (Invited Talk)
14	Dr. Manabendra Sarma	2nd National Conference on Emerging Challenges in the Frontiers of Chemical Sciences (NC-ECFCS-2024)	Department of Chemistry, Manipur University, Manipur, India	21/03/2024 – 23/03/2024	National (Invited Talk)
15	Dr. Samir Kumar Sarkar	3 <sup>rd</sup> International Conference on Main-group Molecules to Materials (MMM III)	Dept. of Chemistry & School of Chemistry Indian Institute of Technology Hyderabad & University of Hyderabad Telangana, INDIA	09/12/2023 to 11/12/2023	International
16	Dr. Samir Kumar Sarkar	20 <sup>th</sup> International Conference on Modern Trends in Inorganic Chemistry (MTIC-XX)	Department of Inorganic & Physical Chemistry, Indian Institute of Science (IISc), Bangalore-560012	14/12/2023 to 17/12/2023	International
17	Prof. Subhas Chandra Pan	International Conference on Organometallics and Catalysis	Goa	30/10/2023-02/11/2023	International
18	Prof. Subhas Chandra Pan	Recent Developments of Chemistry, 2023	Malda College	08/12/2023	National

19	Prof. Subhas Chandra Pan	Emerging Trends in Catalysis and Synthesis	IIT Kharagpur	07/03/2024-09/03/2024	International
20	Prof. Subhas Chandra Pan	Indo-German Conference on Innovation and Global Cooperation for Sustainability	New Delhi	12/03/2024-14/03/2024	International
21	Prof. Chandan Mukherjee	Symposium on Advanced Biological Inorganic Chemistry (SABIC-2024)	Tata Institute of Fundamental Research (TIFR) and Indian Association for the Cultivation of Science (IACS).	07-01-2024 to 11-01-2024	International
22	Prof. Chandan Mukherjee	16 <sup>th</sup> International Symposium on Applied Bioinorganic Chemistry	Karolos Papoulias Conference Center, University of Ioannina, Ioannina, 45110, Greece	11-06-2023 to 14-06-2023	International
23	Dr. Krishna P. Bhabak	Modern Trends in Inorganic Chemistry (MTIC-2023)	IISc, Bangalore	14-17 Dec, 2023	International
24	Dr. Krishna P. Bhabak	Symposium on Advanced Biological Inorganic Chemistry (SABIC-2024)	IACS, Kolkata	7-11 Jan, 2024	International
25	Dr. Krishna P. Bhabak	Emerging Trends in Catalysis and Synthesis (ETCS-2024)	IIT Kharagpur	7-9 Mar, 2024	International
26	Dr. Krishna P. Bhabak	Modern Trends in Inorganic Chemistry (MTIC-2023)	IISc, Bangalore	14-17 Dec, 2023	International
27	Dr. Debdas Dhabal	Young Centre for Advanced Study (CAS) Project Workshop	Centre for Advanced Study at the Norwegian Academy of Science and Letters, located at Drammensveien 78, 0271 Oslo, Norway	8 to 12 January 2024	International
28	Dr. Akshai Kumar A S	Symposium on Physics and Engineering in Medical Sciences	Christian Institute of Health Sciences and Research (CIHSR), Dimapur	23/03/2024	National
29	Dr. Akshai Kumar A S	International Conference on Catalysis (IC2-2024)	Organised by School of Chemistry, IACS Kolkata	11-13/03/2024	International
30	Dr. Akshai Kumar A S	Emerging Trends in Catalysis and Synthesis (ETCS-2024)	Organised by Department of Chemistry, IIT Kharagpur	07-09/03/2024	International
31	Dr. Akshai Kumar A S	4 <sup>th</sup> Frontier Symposium in Chemistry 2024 (FS-CHM-2024)	Organised by School of Chemistry, IISER Thiruvananthapuram	19-21/01/2024	International
32	Dr. Akshai Kumar A S	3rd Main-group Molecules to Materials (MMM-III)	Organized by IIT Hyderabad	9-12/12/2023	International
33	Dr. Akshai Kumar A S	20th International Conference on Modern Trends in Inorganic Chemistry (MTIC-XX)	IISc Bangalore	13-15/12/2023	International
34	Dr. Akshai Kumar A S	International Conference on Organometallics and Catalysis 2023	The Zuri White Sands, Goa Resort & Casino organized by IISER	30/10/2023 to 01/11/2023	International

			Kolkata, IIT Bombay and IISc Bangalore		
35	Dr. Akshai Kumar A S	Science and Technology for Sustainable Future	Organized by Indian National Young Academy of Sciences (INYAS) in association with IIT(ISM) Dhanbad	15-17/09/2023	International
36	Dr. Akshai Kumar A S	World Environment Day # Beat Plastic Pollution	Organized by INYAS in collaboration with Cotton University	05/06/2023	National
37	Dr. Akshai Kumar A S	Research and Industrial Conclave - 2023	IIT Guwahati	14-16/05/2023	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Prof. Bhisma K Patel	Faculty Memorial Lecture Series	Department of Chemistry, Utkal University, Vani Vihar	Bhubaneswar	23/03/2024
02	Prof. Bhisma K Patel	Chemical Sciences for Sustainable Development, Science Academies Lecture,	Department of Chemistry Salipur Autonomous College.	Salipur	25/02/2024
03	Prof. Bhisma K Patel	Photo-Induced Organic Synthesis: A Reagent Less Approach	Department of Organic Chemistry, IISc Bangalore	IISc Bangalore	09/01/2024
04	Prof. Bhisma K Patel	Photo-Induced Organic Synthesis: A Reagent Less Approach	Department of Chemistry, IIT Guwahati	IIT Guwahati	04/11/2023
05	Prof. Bhisma K Patel	Photo, Electro and Thermal Approach to Heterocycles from Organo Nitriles,	Dr. Reddy's Laboratory, Hyderabad	Hyderabad	30/06/2023
06	Prof. Bhisma K Patel	Faculty Memorial Lecture Series	Department of Chemistry, Utkal University, Vani Vihar	Bhubaneswar	23/03/2024
07	Prof. Achalkumar Ammathnadu Sudhakar	Molecular engineering of perylene towards fluidic columnar phases applicable in organic electronics	Chirantan Rasayan Sanstha, Vidyasagar University	Midnapore 721102, West Bengal	28/04/2023

08	Prof. Achalkumar Ammathnadu Sudhakar	Self-Assembled Liquid Crystalline Organic Semiconductors Based on Perylene Derivatives	National Liquid Crystal Society, Andhra University	Visakhapatnam, Andhra Pradesh	2-4/11/2023
09	Prof. Achalkumar Ammathnadu Sudhakar	Development of Discotic Liquid Crystals for the Application in Organic Electronic Devices	Society for Polymer Science in India	IIT Guwahati, Guwahati	9-12/12/2023
10	Prof. Achalkumar Ammathnadu Sudhakar	Superior Electron Mobility, Red Electroluminescence with High quantum efficiency from Printable Room Temperature Columnar Liquid Crystalline Perylene Bisimide	Centre for Nano and Soft Matter Research, Bengaluru	Bengaluru	27-28/03/2024
11	Dr. Manabendra Sarma	Theoretical Chemistry: Quo Vadis?	Department of Chemistry, National Institute of Technology (NIT) Surathkal	Mangalore, Karnataka, India	12/04/2023
12	Dr. Manabendra Sarma	A Computational Exploration of Noncovalent Interactions in Supramolecular Host-Guest to Peptide-based Molecular Anion Receptors	Department of Inorganic and Physical Chemistry, Indian Institute of Science (IISc) Bangalore	Bangalore, Karnataka, India	13/04/2023
13	Dr. Manabendra Sarma	Theoretical Chemistry: Past, Present and Future	15 Minit Xikhya	Online Educational Portal	11/06/2023
14	Dr. Manabendra Sarma	Advancing Careers and Exploring Cutting-Edge Research Directions in Chemistry	Science Camp under Vigyan Jyoti Programme	Indian Institute of Technology (IIT) Guwahati, Guwahati, Assam, India	30/06/2023
15	Dr. Manabendra Sarma	Photochemical Reactions of Conjugated Polyenes: Effect of Substitutions	Indian Institute of Technology (IIT) Bombay	Mumbai, Maharashtra, India	12/10/2023
16	Dr. Dipankar Srimani	Inspirational Talk, Stories of Scientists and Discoveries: Inspirational Scientific Journey	Arya Vidyapeeth College,	Guwahati	10/11/2023
17	Dr. Krishna P. Bhabak	Bioanalyte-triggered Turn-On Fluorogenic Processes for the Simultaneous Delivery of Hydrogen Sulfide and Drugs	IISc, Bangalore	Bangalore	17/12/2023

18	Dr. Krishna P. Bhabak	Stimuli-Responsive Turn-On Fluorogenic Processes toward the Delivery of Hydrogen Sulfide and Drugs	IACS, Kolkata	Kolkata	07/01/2024
19	Dr. Krishna P. Bhabak	Stimuli-responsive Fluorogenic Prodrug for the Simultaneous Delivery of Diclofenac and Hydrogen Sulfide	IIT Kharagpur	Kharagpur	08/03/2024
20	Dr. Uttam Manna	Dr. Pankaj Malla Bujar Barua memorial lecture	Cotton University	Guwahati	28/02/2024
21	Dr. Uttam Manna	CRSI Bronze Medal Lecture at the CRSI-NSC-32	BITS Pilani/CRSI	Pilani	03/02/2024
22	Dr. Uttam Manna	Invited lecture in INTERNATIONAL CONFERENCE FOR FUNCTIONAL MATERIALS AND POLYMER TECHNOLOGY	IIT KGP	Kharagapur	05/12/2023
23	Dr. Uttam Manna	Invited lecture in National Symposium on Emerging Trends in Chemical Sciences	Banaras Hindu University	Banaras	15/12/2023
24	Dr. Uttam Manna	Invited lecture in 17th International conference on Polymer Science and Technology	IIT Guwahati/ The Society for Polymer Science	Guwahati	12/12/23
25	Dr. Uttam Manna	Invited lecture in 8th International Conference on Advanced Nanomaterials and Nanotechnology	IIT Guwahati	Guwahati	01/12/23
26	Dr. Uttam Manna	Invited lecture in Molecularly Designed Functional Materials (MDFM 23)	S&T digital	Kolkata	29/09/23
27	Dr. Uttam Manna	Invited talk at Department of Chemistry, University of Science & Technology Meghalaya	University of Science & Technology Meghalaya	Meghalaya	10/08/2023
28	Dr. Uttam Manna	Invited Lecture, Institut für Anorganische und Analytische Chemie, Goethe-Universität Frankfurt, Germany	Goethe-Universität Frankfurt	Germany	14/07/23
29	Dr. Uttam Manna	Invited Lecture at Institute of Functional Interfaces, Karlsruhe Institute of Technology (KIT), Germany	Institute of Technology (KIT), Germany	Germany	17/05/2023
30	Dr. Akshai Kumar A S	Portable Energy Devices for Powering Rural Health Care Appliances	Symposium on Physics and Engineering in Medical Sciences organized by Christian Institute of Health Sciences and	Dimapur, Nagaland	23/03/2024

			Research (CIHSR), Dimapur		
31	Dr.Akshai Kumar A S	Base Metal Catalysis for Generation of Hydrogen, Fuel & Specialty Chemicals	International Conference on Catalysis (IC2-2024) Organised by School of Chemistry, IACS Kolkata	Kolkata, WB	11-13/03/2024
32	Dr.Akshai Kumar A S	Base Metal Catalysis for Generation of Hydrogen, Fuel & Specialty Chemicals	Emerging Trends in Catalysis and Synthesis (ETCS-2024) Organised by Department of Chemistry, IIT Kharagpur	Kharagpur, WB	07-09/03/2024
33	Dr.Akshai Kumar A S	Pincer-Metal Catalyzed C-H Activation Reactions: Synthesis of Hydrogen, High Value Fuels and Specialty/Value-Added Chemicals	4 <sup>th</sup> Frontier Symposium in Chemistry 2024 (FS-CHM-2024) Organised by School of Chemistry, IISER Thiruvananthapuram	Thiruvananthapuram, Kerala	19-21/01/2024
34	Dr.Akshai Kumar A S	Teaching Old Reagents New Reactions: Base Metal Catalysis for Generation of Hydrogen, Fuel and Specialty Chemicals	organized by the Chemical Society of Mangalore University	Mangalore University, Karnataka	21/12/2023
35	Dr.Akshai Kumar A S	Teaching Old Reagents New Reactions: Base Metal Catalysis for Generation of Hydrogen, Fuel and Specialty Chemicals	3rd Main-group Molecules to Materials (MMM-III) Organized by IIT Hyderabad	Hyderabad, Telangana	9-12/12/2023
36	Dr.Akshai Kumar A S	Organometallic Catalysis for Production of Hydrogen, Biofuels and Specialty Chemicals	International Conference on Organometallics and Catalysis 2023	The Zuri White Sands, Goa Resort & Casino organized by IISER Kolkata, IIT Bombay and IISc Bangalore	30/10/2023 to 01/11/2023



37	Dr.Akshai Kumar A S	Catalysis for Generation of Hydrogen and Fuel Chemicals	Science and Technology for Sustainable Future Organized by Indian National Young Academy of Sciences (INYAS) in association with IIT(ISM) Dhanbad	Dhanbad, Bihar	15-17/09/2023
38	Dr.Akshai Kumar A S	Organometallic Catalysis for Production of Hydrogen Biofuels and Specialty Chemicals	Special Lecture at Organic Chemistry Department, IISc Bangalore	Bangalore, India	11/07/2023
39	Dr.Akshai Kumar A S	Organometallics in Catalytic Conversions: Synthesis of Hydrogen, High Value Fuels and Specialty/Value-Added Chemicals	ChemDist Invited Talk Series on New Generation Technologies	Pune, India	19/06/2023
40	Dr.Akshai Kumar A S	Solutions to Plastic Pollution	World Environment Day # Beat Plastic Pollution Organized by INYAS in collaboration with Cotton University	Guwahati, Assam	05/06/2023
41	Dr.Akshai Kumar A S	Organometallics Catalyzed Production of Hydrogen, Biofuels and Specialty Chemicals	Research and Industrial Conclave – 2023 organized by IIT Guwahati	Guwahati	14-16/05/2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Prof. P. V. Ramachandran	Purdue University	To deliver a talk and interact with faculty and students / Trapping the Potential of Borane-Amine	29/02/2024	Travel support from Prof. B. K. Patel's Project

**SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED**

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/National	No. of participants
01	Prof. Subhas Chandra Pan	Chemistry Colloquium 2023	IIT Guwahati	04/11/2023	International	300
02	Dr. Manabendra Sarma Convener	Spectroscopy and Dynamics of Molecules and Clusters (SDMC) 2024	Participant, Science & Engineering Research Board (SERB) and IISER Kolkata	22/02/2024 – 25/02/2024	National	90
03	Dr. Akshai Kumar	ICANN 2023	MeitY	29/11/2023 to 01/12/2023	International	500
04	Dr. Akshai Kumar	Stage 1: Essay Competition, Stage 2: Debate Competition and Stage 3: Elocution Competition conducted under Model G20 Initiative in association with Ministry of Education Organized by IIT Hyderabad & INYAS	MoE	01/07/2023	International	50

**AWARDS AND HONOURS**

- Prof. Bhisma Kumar Patel: Members of the Editorial Board of Tetrahedron and Tetrahedron Letters; Elsevier.
- Prof. Bhisma Kumar Patel: Prof. G. B. V Subramanian Memorial Lecture; Department of Chemistry University of Delhi.
- Dr. Uttam Manna: Pioneering Investigator in Chemical Communication; Chem Comm, RSC.
- Dr. Uttam Manna: CRSI Bronze Medal; CRSI.

**STUDENTS' ACHIEVEMENTS**

- Mr. Mithu Roy: Best Poster Presentation; JNOST-2023; IISER Pune.
- Mr. Hirak Jyoti Phukan: Best Poster Presentation; SusChemHeca-2024; Tezpur University.
- Mr. Avijit Mondal: Best Oral Presentation; Science, Technology & Innovation-II- 2024; Arya Vidyapeeth College.
- Ms. Riya Mallik: Best Poster Award; Modern Trends in Inorganic Chemistry *MTIC* 2023.
- Ms. Upasana Nath: Financial Assistance from Science & Engineering Research Board (SERB) under International Travel Support (ITS) Scheme.
- Mr. Himangshu Pratim Bhattacharyya: Financial Assistance from Science & Engineering Research Board (SERB) under International Travel Support (ITS) Scheme.

- Ms. Monalisha Sarma: Best Poster Award at Theoretical Chemistry Symposium (TCS) 2023; Indian Institute of Technology (IIT) Madras, Chennai, India.
- Mr. Manash Pratim Sarmah: at 17th Biennial Trombay Symposium on Radiation & Photochemistry; Bhabha Atomic Research Centre (BARC), Mumbai, India.
- Dr. Juhi Dutta; National Post-Doctoral Fellowship; Science & Engineering Research Board (SERB).
- Mr. Dinabandhu Barik: PMRF Fellowship; Ministry of Education Government of India.
- Mr. Supriya Manna: PMRF Fellowship; Ministry of Education Government of India.
- Ms. Himani Narjinari: Best Poster Award; International Conference on Main-group Molecules to Materials MMM III, IIT Hyderabad.
- Mr. Sujay Paul: Best Oral Presenter Award; ICANN 2023 (29<sup>TH</sup> November-1<sup>st</sup> December 2023), Centre for Nanotechnology, IIT Guwahati, Assam.
- Ms. Priya Das: Best Poster Award; SCF 2023 Congress by French Chemical Society (26<sup>th</sup> - 28<sup>th</sup> June 2023), Cité des Congrès de Nantes, France.
- Dr. Mihir Manna: Best Poster Award; RIC 2023 (14<sup>th</sup> -16<sup>th</sup> May 2023), IIT Guwahati, Assam.
- Ms. Sawna Roy: Best Poster Award; INUP i2i (25<sup>th</sup> -27<sup>th</sup> April 2023), Centre for Nanotechnology, IIT Guwahati, Assam.
- Mrs. Konika Choudhury: Best Poster Award; INUP i2i (25<sup>th</sup> -27<sup>th</sup> April 2023), Centre for Nanotechnology, IIT Guwahati, Assam.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	A. S. Achalkumar	Ph.D. (CSMR, Bangalore)	Professor	Liquid crystals, Functional Materials, Molecular Electronics, Self Assembly, Green Chemistry
02	A. S. Akshai Kumar	Ph.D. (IISc Bangalore)	Associate Professor	Organometallic Chemistry, Inorganic Chemistry, Organofluorine Chemistry, Catalysis (Homogeneous and Heterogeneous), C-H and C-F activation
03	Subhendu Sekhar Bag	Ph.D. (IIT Kharagpur)	Professor	Bioorganic Chemistry and Chemistry of Unnatural Nucleic Acid and Peptides
04	Jubaraj B. Baruah	Ph.D. (IISc Bangalore)	Professor	Homogeneous Catalysis, Supramolecular chemistry and material design
05	Krishna Pada Bhabak	Ph.D. (IISc Bangalore)	Associate Professor	Organic and Bio-organic Chemistry
06	Shyam Prosad Biswas	Ph.D. (Ulm University, Germany)	Associate Professor	Gas/Vapor/Liquid Adsorption and Catalytic Applications of Metal-Organic Frameworks
07	Arun Chattopadhyay	Ph.D. (Columbia University)	Professor	Nanoscale Science and Technology
08	Sunanda Chatterjee	Ph.D. (IISc Bangalore)	Associate Professor	Peptide Chemistry, Supramolecular Chemistry, Antimicrobial peptide research, Peptidomimetic chemistry
09	Animesh Das	Ph.D. (University of Goettingen, Germany)	Associate Professor	Organometallic chemistry and catalysis

10	Debapratim Das	Ph.D. (IACS, Kolkata)	Professor	Supramolecular dynamic aggregates, peptides, lipids
11	Gopal Das	Ph.D. (IIT Kanpur)	Professor	Supramolecular, Bioorganic chemistry and Biomineralization
12	Sumana Dutta	Ph.D. (IACS, Kolkata)	Associate Professor	Experimental & Theoretical Physical Chemistry / Self-organization and Nonlinear dynamics
13	Ashish K. Gupta	Ph.D. (Univ. of California, Los Angeles)	Professor	Quantum Molecular Dynamics
14	Parasmeswar K. Iyer	Ph.D. (CSMCRI, Bhavnagar)	Professor	Polymer synthesis, Organic / Organometallic Chemistry & Device fabrication, Sensors
15	Chandan K. Jana	Ph.D. (WWU Muenster, Germany)	Professor	Total Synthesis/ Natural Product Based Drug Discovery/ Synthetic Methodology/ Development of New Reaction
16	Pavan K. Kancharla	Ph.D. (IIT Kanpur)	Associate Professor	Organic Chemistry, Carbohydrate Chemistry, Development of Synthetic Methodology, Organocatalysis.
17	Abu Taleb Khan	Ph.D. (Kalyani University, W.B)	Professor	Synthesis of Natural Products, Heterocycles and Carbohydrate Chemistry, Newer Methodologies
18	G. Krishnamoorthy	Ph.D. (IIT Kanpur)	Professor	Organic Photochemistry & Spectroscopy
19	Lal Mohan Kundu	Ph.D. (LMU Munich, Germany)	Professor	Nucleic Acid / Peptide Chemistry, DNA / RNA Damage and Repair, DNA Hybrid Materials
20	Kingsuk Mahata	Ph.D (University of Siegen, Germany)	Associate Professor	Solar Fuel from Water, Supramolecular Catalysis, Theranostic Nano-Medicine
21	V. Manivannan	Ph.D. (IACS, Calcutta)	Professor	Coordination Chemistry
22	Bhubaneswar Mandal	Ph.D. (EPFL, Lausanne, Switzerland)	Professor	Peptide Chemistry and Amyloid Research
23	Debasis Manna	Ph.D. (University of Illinois at Chicago)	Professor	Lipid-Protein Interaction, Lipid Synthesis
24	Uttam Manna	Ph.D. (IISc, Bangalore)	Associate Professor	Bio-Inspired Polymeric Materials.
25	Biplab Mondal	Ph.D. (IIT Bombay)	Professor	Coordination and Bioinorganic Chemistry
26	Chandan Mukherjee	Ph.D. (Max-Planck Institute of Bioinorganic Chemistry, Muelheim, Germany)	Professor	Oxidation Catalysis / Molecular Magnetism / Synthesis of Single-Molecule Magnets (SMMs) / MRI Contrast agents / Water Oxidation Chemistry
27	Subhas Chandra Pan	Ph.D. (Max-Planck-Institut fuer Kohlenforschung, Muelheim an der Ruhr, Germany)	Professor	Synthetic organic chemistry: Natural product synthesis with the emphasis of new synthetic methodology; development of asymmetric organocatalysis and transition metal catalysis with new catalyst design; mechanistic study

28	Aditya N. Panda	Ph.D. (IIT Kanpur)	Professor	Dynamics of bimolecular scattering processes
29	Bhisma K. Patel	Ph. D. (IIT Kanpur)	Professor	Bio-Organic Chemistry and Newer Methodologies
30	Anumita Paul	Ph.D. (Columbia University)	Professor	Surface Science, Catalysis, Thin Films
31	Sandip Paul	Ph.D. (IIT Kanpur)	Professor	Computational Biophysics and Chemistry
32	T. Punniyamurthy	Ph.D. (IIT Kanpur)	Professor	Synthetic Organic Chemistry
33	Mohd Qureshi	Ph.D. (IIT Kanpur)	Professor	Materials Chemistry
34	Manabendra Ray	Ph.D. (IIT Kanpur)	Professor	Bioinorganic and Coordination chemistry
35	Kalyan Raidongia	Ph.D. (JNCASR)	Associate Professor	Physical Chemistry
36	Kalyanasis Sahu	Ph.D. (IACS, Kolkata)	Professor	Time Resolved Absorption and Fluorescence Spectroscopy, SHG, MUPPETS
37	Anil Kr. Saikia	Ph.D. (RRL Jorhat)	Professor	New Synthetic Methodology & Natural Product Synthesis
38	Chivukula V. Sastri	Ph.D. (University of Hyderabad)	Professor	Biomimetic Chemistry and Chemical Biology
39	Manabendra Sarma	Ph.D. (IIT Bombay)	Associate Professor	Development of new theoretical approaches to: Laser Assisted Control of Chemical Reactions, Resonances in Electron – Molecule Scattering, and Electronic Structure Theory and Quantum Molecular Dynamics of Small to Large Systems
40	Dipankar Srimani	Ph.D (IACS, Jadavpur)	Associate Professor	Organic, Organonometallic Chemistry
41	<u>Samir Kumar Sarkar</u>	Ph.D. (IISc, Bangalore)	Assistant Professor	Main-group chemistry, Carbon capture utilization and storage (CCUS) and Material Chemistry
42	<u>Debdas Dhabal</u>	Ph.D (IIT Delhi)	Assistant Professor	Computational Material Science and Biomaterials
43	<u>Kalishankar Bhattacharyya</u>	Ph.D. (IACS, Kolkata)	Assistant Professor	Computational methods and applications to material science, particularly in energy conversion and storage

# Civil Engineering

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 1998**

**ACADEMIC PROGRAMMES OFFERED:** The Department is currently having B.Tech, M.Tech and PhD Programmes. The Post Graduate (PG) includes the following specialization:

- Structural Engineering
- Water Resources Engineering and Management
- Geotechnical Engineering
- Environmental Engineering
- Transportation Systems Engineering
- Infrastructure Engineering & Management
- Earth System Science and Engineering

**LABORATORY FACILITIES****Engineering Survey Laboratory:**

This lab is equipped with a wide array of state-of-the-art facilities required for conducting Engineering Survey. Some of the crucial equipment available in this laboratory are Unmanned Aerial Vehicle (Drone), Terrestrial Laser Scanner (TLS), Differential Global Positioning System (DGPS), Total Station, Digital Theodolite, Auto Level and Hand-held Global Positioning System (GPS).

**Environmental Engineering Laboratory:**

Environmental Engineering laboratory is equipped with some of the sophisticated instruments such as Atomic Absorption Spectrophotometer (AAS) for heavy metals analysis in ppm and ppb levels, UV-Visible Spectrophotometer for the quantitative determination of different analytes like transition metal ions and highly conjugated organic compounds, Gas Chromatograph for separating and analyzing compounds that can be vaporized without decomposition, Ion Chromatograph for analyzing organic and inorganic compounds, Laser Particle Size Analyzer for particle size gradation in the range 0.02- 2000  $\mu\text{m}$  etc. The laboratory is also equipped with some of the major instruments for air quality monitoring like Micro-meteorological monitoring system with required accessories and data logging system and software (automatic), Cascade Impactor etc. The laboratory has also a well-equipped micro-biology division with microbial research facilities to enrich, isolate, and identify noble bacterial species. The laboratory is equipped with the instrumentation facilities for water quality and wastewater analysis, solid waste and hazardous waste characterization.

**Geotechnical Engineering Laboratory:**

The geotechnical engineering laboratory aims to conduct testing and research for the identification of the engineering behavior of geo-materials such as soils, rocks, geo-synthetics, fly-ash, composite materials and different by-products of the geo-materials. The research expertise endorsed by the lab has been successfully used in multi-faceted geotechnical problems involving foundations, dams, embankments, tunnels, reservoirs, pavement subgrades, slopes, retention systems, seismicity and rainfall affected systems, as well as specialized applications like waste containment systems, bio-stabilization, nuclear repository containment and harnessing of geothermal energy. The precision of such design and analyses largely depends on the experimental information and numerical modeling skills supported by the geotechnical laboratory. The primary aim of the geotechnical laboratory is to look for avenues of safe and economic design, analyses and stabilization approaches, which is the need of the hour of North-Eastern region. The geotechnical laboratory is equipped with state-of-the-art instruments essential to determine the different physical, chemical, geotechnical and geophysical properties of the geo-materials. The major equipments already present in the laboratory are the Cyclic triaxial testing apparatus, Multi-channel data logging (MASW accompanied by cross-hole apparatus), Unsaturated triaxial setup, Rock testing equipments, Research Centrifuge, Guelph Permeameter, Cross

permeability test apparatus, automated Direct shear and Consolidation setups and several others. The laboratory is also well equipped with specialized network licensed numerical and modeling softwares such as GeoStudio, PLAXIS 2D and 3D, RocScience, FLAC, 2007, to name a few. The major equipments which are under the process of acquirement in 2017-18 are Flame Photometer, High Accuracy Digital Balance, Vane Shear Apparatus, Direct Shear Apparatus, Torshear Ring Apparatus (arriving soon), ProCheck Digital/Analog Sensor Handheld Readout, and Water Distillation Unit.

### **Infrastructure Engineering and Management Laboratory:**

Project Management Laboratory with well-equipped computing facilities along with the state-of-the-art project management and infrastructure planning softwares such as MS Projects, Primavera Project Planner, and Autodesk Revit Building Suite.

Some of the quantitative analyses carried out in this laboratory include:

- Financial modelling of infrastructure projects
- Construction cost estimation and rate development
- Earned value analysis of infrastructure projects
- Resource driven scheduling
- Dimensional modelling of built facilities
- Risk analysis and assessment of infrastructure projects

Concrete Testing laboratory is equipped with sophisticated equipment for carrying out tests on special concrete such as self-compacting concrete (SCC) and foamed concrete. Other important facilities include the equipment to study the corrosion behavior of steel reinforcement, shrinkage and microstructure of concrete.

### **Structural Engineering Laboratory:**

This lab is equipped with state-of-the-art facilities for conducting high end experimentation in the field of Structural Engineering and is equipped with equipment like Overhead EOT Crane for Structural test hall, Universal Test frame, NDT equipment like Corrosion analyzing, Rebar locator, Permeability tester, Resistivity meter, extraction tester, Dynamic Actuator system, Earthquake simulator, Pseudo Dynamic Test Facility, FFT analyzer for vibration testing of structural elements, Resonant frequency meter, HBM-48channel data acquisition system, Hydraulic Fork Lift, A-Frame Aluminium Ladder (16ft high), Automatic Vicat's apparatus for SC, Initial and Final Setting of Cement, 500 LPM in Powerpack for MTS test system, Real Time Hybrid Simulation Facility for dynamic testing of structures, Reaction Mass Assembly for Electoseis Long Stroke Shaker Model 113 etc., Abaqus V 6.8 software, ANSYS – v13, SAP 2000 – v14 , MIDAS , Primavera etc.

### **Transportation Systems Engineering Laboratory:**

This lab has two major sub divisions - Pavement Engineering and Traffic Engineering encompassing all the specialized areas of Transportation Systems Engineering. The Pavement Engineering section is equipped with many state of the art equipment not only for testing pavement materials such as bitumen, aggregates and soil, but also for in-situ pavement evaluation. Some of the major equipment available in the lab are Setup of major equipment for production and design of Cold Mixes (Wet Track Abrasion, Cohesion Tester, Schulze Breuer and Loaded Wheel Tester), Pneumatic Universal Testing Machine (UTM), Gyratory Compactor, Falling Weight Deflectometer (FWD), Dynamic Shear Rheometer (DSR), Digital Marshall cum Indirect Tensile Strength Tester, CoreDry and CoreLok. On the other hand, the Traffic Engineering Laboratory is equipped with a wide array of facilities required for Traffic data collection and analysis. This lab is well equipped with many sophisticated equipment such as Video VBox, Handheld Roughometer, Speed Radar Guns, Portable Mast Assembly and Dipstick. In addition to this, many software such as VISSIM, MXRoad and HDM-4 are also available in the simulation section of this laboratory.



**Water Resources Engineering Laboratory:**

Water Resources Engineering laboratory is equipped with some of the sophisticated instruments such as Acoustic Doppler Velocimeter (ADV) for recording instantaneous velocity components at a single-point, Acoustic Doppler Current Profiler (ADCP) for measuring water current velocities, DGPS, Spectroradiometer, Miniature Tensiometer to measure soil suction pressure etc. The laboratory has a 5 m flow channel or flume which is mostly used for carrying out experiments and demonstrations in water flow, friction in a uniform flow channel, flow over a sharp-crested weir, crump weir, streamlined hump, flow under a sluice gate etc. The laboratory has also a 20 m long tilting flume for conducting real time open-channel flow simulation experiments. Another 30 m long flume has been installed for undertaking cutting edge research in the area of open channel flow, sediment transport processes etc. Work is also being carried out in land use and land cover classification, river migration, water-shed delineation, flow accumulation and hill slope hydrology. The laboratory is also equipped with Drainage and Seepage Tank, 3D Ground Water Flow Laboratory Model for conducting experimental study regarding flow through permeable media, flow line visualization, flow net construction, determination of seepage rate, verification of Darcy's law etc. Research work is also being carried out regarding determination of soil hydraulic conductivity which is one of the governing factors for controlling flow through porous media. Both field and laboratory experiments are simultaneously conducted using different types of infiltrometers like Double Ring infiltrometer, Mini disc infiltrometer, tension infiltrometer etc. for determining hydraulic conductivity of soil, followed by mathematical analysis using numerical tools like HYDRUS to estimate the soil hydraulic properties. Latest versions of the applicable software such as Geomatica, MIKE 21C & CCHE3D have been procured to carry out research related work.

**Computational Laboratory:**

There are three nos. of computer laboratories out of which one lab is located in the M-Block which has around 60 number of Desktop Computers all properly connected to the network and to the centralized UPS system, a wide screen LED Display and a good number of computer related books. The other two labs are in the Annexure Building which has dedicated Wi-Fi facility. A Departmental Server Room is located at M-Block of our Department which has all the license servers for the licensed software of our Department. The licensed software are: SAP 2000, ANSYS 13.0 & 17.0, ABACUS 6.8, Arc GIS, COMSOL 4.2 & 4.2a, MIDAS GEN & MIDAS Civil, GROUND WATER MODELLING SOFTWARE (GMS), WMS 8.2, PLAXIS 2D & 3D, HYPERMESH, LS DYNA, ROC SCIENCE, ETAB, CSI BRIDGE, GEO STUDIO 2012, ERDAS, SPACE GASS. The Lab has three numbers of Servers. One Server is of Make DELL and Model Dell Power Edge R730, the second server is of Make HP and Model HP Proliant DL380 Gen9 and the third server is of Make IBM and Model X3650 M3. The Lab has one number of storage box of Make IBM and Model DS 3500. The Lab has a 26U Floor Mount Server Rack system of Make Valrack with two numbers of fan and 1 number of power distribution units. The Lab has a centralized UPS facility.

**Earth System Science and Engineering:**

Earth System Science and Engineering specialization is one of the seven specializations offered by Department of Civil Engineering, Indian Institute of Technology Guwahati. This specialization has a multidisciplinary approach to study various aspects of the Earth systems. This unique programme was started in 2016 with the objectives to provide high quality classroom, laboratory and field education. This specialization offers both M.Tech and Ph.D. program.

North-eastern region of India is blessed with natural resources (natural and mineral resources including oil and gas) and located in a seismic zone that demands close monitoring of geophysical parameters. In the backdrop of accelerated infrastructure development for national growth, growing incidences of geohazards and natural uncertainties such as climate change has necessitated systematic understanding of the Earth systems in order to build future infrastructures pragmatically, and seek sustainable solutions for hazard related uncertainties. To address these problems scientifically, this specialization is actively involved in various interdisciplinary research projects and consultancy assignments.

Apart from the contemporary learning, students of this specialization will be trained with latest techniques of quantitative analyses which can be directly used for the identification and exploration of natural resources. This will provide research and employment opportunities in various sectors such as mineral & hydrocarbon exploration, natural resource management, geo-environment etc.

### MAJOR EQUIPMENT AND FACILITIES ACQUIRED

MIKE Model manager, 1D Pipeflow, 1D River, 2D Overland, Rainfall Runoff, Control Software; Concrete Profometer

### MAJOR AREAS OF RESEARCH AND DEVELOPMENT

Soil Dynamics, Geo-environmental Engineering, Ground Improvement, Landslides, Behavior of Clays and Clay Minerals, Sustainable development, Public Private Partnerships, Risk Management, Construction Management, Durability studies in concrete, Corrosion of steel reinforcement and protection measures, High performance concrete, Mass transport in cementitious materials, Non-destructive testing of concrete structures, Light weight concrete (Foam concrete), Shrinkage behaviour and thermal performance of concrete, Sustainable materials in construction, Hydrological modeling, Earth and planetary exploration., Study of sediment dynamics in fluvial systems, Petrophysical Modelling for Petroleum Exploration, Environmental impact/risk assessment & management, Remote Sensing and GIS for mapping groundwater potential and recharge, Geodesy and mapping, Photogrammetry and LiDAR., Integration of remote sensing techniques, Sensor calibration and synthetic simulation, Airborne remote sensing (Unmanned Aerial Vehicles) for mapping and exploration, Advance Remote Sensing (hyperspectral, thermal and microwave) and GIS techniques Natural Resource Management, earthquake engineering, structural mechanics, structural dynamics, fracture and fatigue mechanics, finite element analysis, durability of structures, non-destructive testing, construction materials, numerical and analytical methods, computer aided analysis, passive and semi-active control, retrofitting of structures, computational mechanics, IT in construction management, structural analysis and design, performance based seismic design, system identification & structural health monitoring, seismic damage assessment, bridge engineering, wind induced vibration& control, random vibration, nonlinear behaviour of structures, ultrasonic wave propagation, acoustic-impact detection, time-frequency analysis, impact and blast resistant design, reliability analysis and performance based engineering, design and optimization of protection measures, sustainable construction and sustainable construction materials, Removal of heavy metals from wastewater using amine based functionalized polymers, Biodegradation of industrial wastewater, Removal of toxic pollutants like phenol, ammonia, thiocyanate, pyridine from wastewater in fed batch type reactors by indigenous cultures and Air quality modeling in urban transport and industrial environment, Pavement Evaluation and Management, Road Safety, Traffic Flow and Travel Behavior Modeling,

### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: INTERNATIONAL, NATIONAL

Name of Faculty	Name of Conference/Workshop	Place	Date	International/National
Sudip Talukdar	Recent Advances in Construction Materials and Structures “Fatigue assessment of a bridge with bifurcation of load cycles”	PSG College of Technology, Coimbatore	Feb 2-3, 2023	National

<b>Sudip Talukdar</b>	<b>Creative and innovative solution in Civil Engineering “UBFS based fiber reinforced geopolymer concrete as jacketing material for retrofitting”</b>	<b>MNIT Jaipur</b>	11-12 August, 2023	<b>International</b>
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## AWARDS AND HONOURS

- **Dr. Arindam Dey:** Member of the Expert Committee for Capacity Building and Training on Geospatial Science and Technologies (Summer-Winter School) of National Geospatial Program (NGP, erstwhile NRDMS) of DST-GOI from 2021 for 3 years.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Barua, Gautam	Ph. D. from Indian Institute of Technology, Kharagpur	Professor	*Flow through porous media
02	Bharadwaj Neepjyoti	Ph.D. - University of Missouri - Columbia	Assistant Professor	* Traffic safety. * Naturalistic Driving Study. * Traffic flow theory. * Econometric Modeling
03	Bharat, T. Venkata	Ph. D. Indian Institute of Science, Bangalore, India	Professor	*Behavior of unsaturated soils during infiltration & drainage *Settlement behavior of ultra-soft soils and mine tailings *Contaminant transport through landfill liners *Mineralogical aspects of clays *Inverse analysis of geotechnical & geoenvironmental engineering problems
04	Bharti, Rishikesh	PhD Indian Institute of Technology Bombay, Mumbai.	Assistant Professor	* Application of remote sensing and Geographic Information System (GIS). * Airborne remote sensing (Unmanned Aerial Vehicles) for mapping and exploration. * Advance remote sensing (hyperspectral, thermal and microwave) and GIS techniques for the earth and planetary exploration.
05	Bhattacharjya, Rajib K.	PhD, Indian Institute of Technology Kanpur,	Professor	*Water Resources System Management *Genetic Algorithms *Artificial Neural Networks
06	Chakraborty, Arunasis	PhD - Trinity College, Dublin, Ireland	Professor	• Random Vibration & Wavelet Analysis • System Identification & Damage Detection

				<ul style="list-style-type: none"> <li>• Uncertainty Quantification &amp; Reliability Based Design</li> </ul>
07	Chakraborty, Saswati	PhD IIT Bombay	Professor	<ul style="list-style-type: none"> <li>• Heavy metal removal by polymers</li> <li>• Aerobic granular reactors</li> <li>• Sequential treatment of industrial wastewater</li> <li>• Constructed wetland for wastewater treatment</li> </ul>
08	Chakraborty Sayantan	Ph.D. - Indian Institute of Technology Bombay	Assistant Professor	<ul style="list-style-type: none"> <li>*Shear zones and Fault zones</li> <li>*Evolution of Mountain Belts</li> <li>*Microstructures</li> <li>*Thermochronology</li> </ul>
09	Choudhary, Rajan	Ph.D Indian Institute of Technology Roorkee	Professor	<ul style="list-style-type: none"> <li>*Pavement Analysis and Design</li> <li>*Highway Construction and Quality Control</li> <li>*Pavement Material Characterization</li> <li>*Pavement Evaluation and Maintenance</li> <li>*Traffic Engineering</li> </ul>
10	Das, Sandip	Ph.D – Indian Institute of Technology Kanpur	Associate Professor	<ul style="list-style-type: none"> <li>*Earthquake Engineering</li> <li>*Structural Dynamics</li> <li>*Random Vibration</li> </ul>
11	Dasgupta, Kaustubh	Ph.D. Indian Institute of Technology Kanpur, India	Associate Professor	<ul style="list-style-type: none"> <li>*Earthquake Engineering</li> <li>*Design of Reinforced Concrete Structures</li> <li>*Retrofitting of Structures</li> </ul>
12	Dashora, Ajay	Ph. D, IIT Kanpur	Assistant Professor	<ul style="list-style-type: none"> <li>* Synthetic Simulation</li> <li>* Sensor Calibration</li> <li>* Airborne and Terrestrial LiDAR</li> <li>* Thermography</li> <li>* Integration of Remote Sensing Technologies</li> <li>* Development of Lumped Parameter Models</li> <li>* Flight Planning</li> <li>* Unmanned Aerial Vehicles (UAVs) for Mapping</li> </ul>
13	Deb, Sajal Kanti	Ph. D. IIT Roorkee	Professor	<ul style="list-style-type: none"> <li>*Passive and semi-active control</li> <li>*Performance based seismic design</li> <li>*System identification &amp; structural health monitoring</li> <li>*Seismic damage assessment</li> </ul>
14	Dey, Arindam	Ph. D. IIT Kanpur	Associate Professor	<ul style="list-style-type: none"> <li>*Geosynthetic Reinforced Foundation Beds</li> <li>*Geotechnical Lumped Parameter and Continuum Mechanics Modeling</li> <li>*Parameter Estimation of Geotechnical Models</li> <li>*Optimization, GA, ANN and Soft Computing in Geotechnical Engineering</li> <li>*Ground Modification and Improvement Practices</li> <li>*Soil-Structure-Foundation Interaction</li> <li>*Reinforced Soil Structures</li> <li>*Landslides and Slope Stability Analysis</li> <li>*Seismic and Ambient Health Monitoring of</li> </ul>

				<p>Geotechnical Structures</p> <p>*Reliability and Uncertainty Analysis in Geotechnical Engineering</p> <p>*Forensic Investigation in Geotechnical Engineering</p> <p>*Subsurface Profiling and Soil Investigation</p> <p>*Soil Dynamics and Earthquake Engineering</p>
15	Dutta, Anjan	Ph.D – Indian Institute of Technology Delhi	Professor	<p>*Finite Element Mesh Generation</p> <p>*Optimization</p> <p>*Control, Health Monitoring and Retrofitting of structures</p>
16	Dutta, Subashisa	Ph.D. Indian Institute of Technology Kharagpur	Professor	<p>*Meso-Scale Distributed hydrological modeling</p> <p>*Satellite Remote Sensing and GIS for Water resources Management</p> <p>*Computational river hydraulics and its applications</p> <p>*Watershed and Irrigation Management</p>
17	Ghosh, Pranab Kumar	Ph.D – Indian Institute of Technology Kharagpur	Professor	<p>*Water treatment for domestic and industrial use</p> <p>*Domestic and Industrial wastewater treatment</p> <p>*Sludge treatment by physicochemical and biological process</p>
18	Gokhale, Sharad B. (Head)	Ph.D. Indian Institute of Technology Delhi.	Professor	*Air Pollution and Environmental Noise
19	Hazra, Budhaditya	PhD - University of Waterloo, Canada	Associate Professor	<p>*Deterministic and Stochastic Structural Dynamics</p> <p>*System Identification</p> <p>*Blind source separation</p> <p>*Time-frequency analysis</p> <p>*Vibration based condition monitoring</p>
20	Jawed, Mohammad	• Ph D Indian Institute of Technology Kanpur	Professor	<p>*Biological Wastewater Processes</p> <p>*Anaerobic Wastewater Treatment</p> <p>*Heavy Metal Removal and Recovery</p> <p>*Water Treatment and Supply</p> <p>*Domestic &amp; Industrial Wastewater Treatment</p>
21	Johari Sparsh	Ph.D. - Indian Institute of Technology Delhi	Assistant Professor	<p>*Construction Project Management</p> <p>*Workforce Management</p> <p>*Capacity Building</p> <p>*Skill Development Training</p> <p>*Construction Productivity</p> <p>*Project Performance</p> <p>*Construction Quality</p> <p>*Safety, and health</p>
22	K., Ravi	Ph.D – Indian Institute of Science (IISc) Bangalore	Associate Professor	<p>*Geo-environmental engineering</p> <p>*Geo-energy systems</p> <p>*Engineering behaviour of unsaturated soils</p> <p>*Research on hazardous waste management</p>

23	Kalamdhar, Ajay	Ph.D. Indian Institute of Technology Roorkee, India	Professor	*Solid waste management *Mechanical composting and vermicomposting *Analysis of solid wastes
24	Kar Santu	Ph.D. - Indian Institute of Technology Delhi	Assistant Professor	*Construction Project Management *Material Management *Automation in Construction *Optimization in Construction Management *Sustainable Construction *Risk Management *Green and Affordable Housing *Construction Productivity
25	Kartha, Suresh A.	Ph.D from Indian Institute of Technology Kanpur	Professor	*Flow and transport through porous media *Heap leaching *Hydrology *Numerical modeling
26	Kaushik, Hemant B.	Ph.D Indian Institute of Technology Kanpur, India	Professor	*Earthquake Resistant Design *Nonlinear Behaviour of Structures *Retrofitting of Structures *Finite Element Modeling
27	Kumar, Abhishek	PhD Indian Institute of Science, Bangalore, India	Associate Professor	*Seismic hazards of Urban Centers *Ground Motion Simulations *Liquefaction *Seismic hazard for Nuclear Power Plants *Site response studies for deep basins *Multichannel Analysis of Surface Waves (MASW) and Ground Penetration Radar (GPR) *Subsoil Investigations and Geotechnical Engineering *Soil Dynamics *Dynamic testing's on Piles *Ground Improvement, Reinforced earth structures *Deep Excavations
28	Kumar, Bimlesh	PhD (Indian Institute of Science, Bangalore)	Professor	*Small scale studies of mixing tanks *Experimental Studies of Aeration Systems *Sediment Transport analysis *Pipeline analysis *CFD simulation *Surge analysis
29	Mahanta, Chandan	PhD (Jawaharlal Nehru University, New Delhi)	Professor	*Water Quality *Sediment Dynamics in Fluvial Systems *Environmental Impact, Risk Assessment and Management *Environmental Geo-informatics *Engineering Geology

30	Mallikarjuna, Chunchu	PhD – Indian Institute of Technology Delhi	Professor	*Traffic flow theory and Modeling *Traffic data collection and analysis *Travel demand modeling
31	Maurya, Akhilesh K.	PhD - Indian Institute of Technology (IIT) Kanpur.	Professor	*Driver behaviour *Traffic flow theory and modeling *Traffic engineering
32	Mishra, Anil Kumar	PhD - Kyushu University, Fukuoka, Japan	Associate Professor	*Chemical compatibility studies of soil-bentonite mixtures *Waste (municipal, industrial and hazardous) management and disposal *Unsaturated soil mechanics
33	Nair, Archana M.	PhD IIT Bombay	Associate Professor	* Remote Sensing for Planetary Exploration * Petrophysical Modelling for Petroleum Exploration * Thermal IR Emission and Reflectance Spectroscopy * Hyperspectral Remote Sensing for Mineral Exploration * Remote Sensing and GIS for Hydrogeological studies
34	Oinam Romanbabu Meetei	PhD - Indian Institute of Technology Delhi	Assistant Professor	* Seismic evaluation & Retrofitting of structures. * Supplemental damping & Energy dissipating devices. * Performance-based seismic design of structures. * Fiber-reinforced concrete. * Large scale testing of structures using Quasi-static, Pseudo-dynamic, and Hybrid simulation methods. * Numerical modeling of reinforced concrete and steel structures
35	Padmanabha Vivek	PhD - Indian Institute of Science, Bangalore	Assistant Professor	*Impact Geomechanics: investigating the properties of geomaterials (soils-rocks) under high strain rate and high pressure loading. *Shock attenuation and compression phenomena in granular /porous materials *Dynamic fracture and fragmentation in rocks *Blast resistance and mitigation strategies on Geotechnical Structures
36	Pradhan, Bulu	PhD - (Indian Institute of Technology Delhi, India)	Professor	*Durability studies in concrete *Corrosion of steel reinforcement and protection measures *High performance concrete

				<ul style="list-style-type: none"> <li>*Mass transport in cementitious materials</li> <li>*Non-destructive testing of concrete structures</li> <li>*Construction management</li> </ul>
37	Rajani, G. Indu Siva	PhD – Indian Institute of Technology Madras	Assistant Professor	<ul style="list-style-type: none"> <li>*Light weight concrete (Foam concrete)</li> <li>*Durability related studies on concrete</li> <li>*Shrinkage behaviour and thermal performance of concrete</li> <li>*Sustainable materials in construction</li> <li>*Lean concepts of construction</li> <li>*Construction management</li> </ul>
38	RB Sharmila	PhD - Indian Institute of Technology Bombay	Assistant Professor	<ul style="list-style-type: none"> <li>*Machine learning</li> <li>*Intelligent Transportation System</li> <li>*Driver behaviour studies</li> <li>*Traffic safety and sustainable transportation</li> </ul>
39	Ryntathiang, Teiborlang. Lyngdoh	Ph.D – Indian Institute of Technology, Kharagpur	Professor	<ul style="list-style-type: none"> <li>*Pavement Materials</li> <li>*Precast Concrete Block Pavement</li> <li>*Cast In-Situ Concrete Block Pavement</li> </ul>
40	Sreeja, Pekkat	Ph. D. Indian Institute of Technology Bombay	Associate Professor	<ul style="list-style-type: none"> <li>*Urban Flood Modeling</li> <li>*Modeling and Control of Open Channel Flows</li> <li>*Infiltration and artificial recharge</li> <li>*Stochastic Hydrology</li> <li>*River Mechanics</li> </ul>
41	Sarma, Arup Kumar	Ph.D. – Guwahati University	Professor	<ul style="list-style-type: none"> <li>*Modeling &amp; simulation in Free Surface Flow</li> <li>*Heuristic Method in Reservoir Optimization</li> <li>*GIS based Watershed Modeling</li> </ul>
42	Sharma, Hrishikesh	Ph.D Zachry Department of Civil Engineering, Texas A&M University,	Associate Professor	<ul style="list-style-type: none"> <li>*Impact and Blast Resistant Design</li> <li>*Reliability Analysis and Performance Based Engineering</li> <li>*Design and Optimization of Protection Measures</li> </ul>
43	Shelke, Amit Balasaheb.	Ph.D (The University of Arizona)	Associate Professor	<ul style="list-style-type: none"> <li>*Ultrasonic wave propagation</li> <li>*Acoustic-Impact detection</li> <li>*Non-destructive testing</li> </ul>
44	Singh, Arbind K.	Ph.D (IISc Bangalore)	Professor	<ul style="list-style-type: none"> <li>*Information Technology in Construction Engineering</li> <li>*Object-Oriented Programming</li> <li>*Constitutive modeling</li> </ul>
45	Singh, Baleshwar	Ph.D. Indian Institute of Technology Delhi	Professor	<ul style="list-style-type: none"> <li>*Marine Geotechnology</li> <li>*Modelling of Onshore &amp; Offshore Foundations</li> <li>*Soil Stabilization &amp; Ground Modification</li> <li>*Pavement Subgrade &amp; Site Characterization</li> </ul>
46	Singh, K. Darunkumar	PhD Southampton University	Professor	<ul style="list-style-type: none"> <li>*Structural Analysis and Design</li> <li>*Finite Element Method</li> <li>*Fracture and Fatigue Mechanics</li> </ul>



47	Singh, Laishram Boeing.	Ph.D, Indian Institute of Technology Madras)	Professor	*Public Private Partnerships *Risk Management *Construction Management
48	Sreedeeep, Sekharan.	Ph. D. – IIT Bombay	Professor	*Behavioral studies on unsaturated porous media *Characterization of geo-materials (soils and rocks) *Thermal characteristics of geo-materials *Contaminant transport and retention studies *Waste containment studies *Landslides
49	Siddagangaiah, Anjan Kumar	PhD (Indian Institute of Technology Madras)	Associate Professor	*Analysis and Design of Pavement Structures *Pavement Material Characterization *Pavement Construction and Recycling *Pavement Management Systems *Pavement Evaluation using NDT *Forensic Investigations of Pavement Failures
50	Taki Kaling	PhD - Indian Institute of Technology Gandhinagar	Assistant Professor	* Problematic soil. * Ground improvement. * Solid waste management. * Sustainable construction material. * Nanomaterials. * Construction biotechnology. * Contaminant remediation and containment. * Soil pollution.
51	Talukdar, Sudip	PhD – Indian Institute of Technology Kanpur	Professor	*Structural Dynamics *Bridge Engineering *Wind induced vibration & control *Non destructive techniques
52	Verma Abhishek	PhD – Indian Institute of Technology Delhi	Assistant Professor	* Seismic evaluation & collapse performance of structures. * Steel and composite structures. * Cold-formed steel. * Passive energy dissipating devices.

# Computer Science and Engineering

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT:** 1995

**ACADEMIC PROGRAMMES OFFERED:** B.Tech., M.Tech., Dual Degree (M.Tech. + Ph.D.), Ph.D., IPDF

## **LABORATORY FACILITIES**

**Multimedia Laboratory:** Our research mainly focuses on Deep Learning approaches to solving different Computer Vision problems like image, video restoration, underwater vision, super-resolution, satellite image segmentation, image translation, image steganalysis, zero-shot learning, adversarial perturbation, etc. Besides computer vision problems, our group also explores different ML-based approaches for adaptive video streaming in a 5G environment. Currently, nine research scholars, seven master's students, and seven undergraduate students are working in the lab. We have published 38 journal papers and more than 60 conference papers in different premium journals and conferences.

Multimedia Lab is well equipped for state-of-art research in multimedia, image and video processing domains, providing IBM X3500 M4 sever, HP: Z420 Xeon E5 workstation, SONY HDR PJ820 camcorder, SONY LED KDL55W950 display facility, high-end desktops, laptops and other necessary lab equipments.

**Robotics and Speech Laboratory:** The Lab. has developed in-house, an open source Multi-Agent emulator, nicknamed Tartarus. The same has been written in SWI-Prolog. Tartarus, facilitates users to create a network of nodes comprising either a single PC/laptop/embedded systems (such as Raspberry Pi) or several such devices connected as a LAN (wired/wireless). It facilitates programming both static and mobile agents. Agents in Tartarus are basically programs written in Prolog. They can be programmed to perform tasks autonomously at select nodes and even made to migrate to others autonomously in the network they inhabit. Such agents can even be programmed to clone (copy and multiply) on-the-fly and then move around the network and execute tasks concurrently, providing a distributed and decentralized processing environment. These agents can also carry programs as payloads. Payloads could be written in either Prolog or Python and executed at desired nodes. One could try out using other languages as well. Agents can communicate amongst each other and also with programs resident at a node. As of now, Tartarus can be run on Windows, Ubuntu and Raspbian operating systems. Tartarus can run on the Raspberry Pi too. It can be used to sense the sensors on-board and also control the actuators (motors, relays, etc.) connected on-board. The research focuses on distributed and decentralised cyber physical systems with an emphasis on Bio-inspired algorithms.

The Lab is equipped with NXT Mindstrom LEGO sets Education Based (v.LEGO 9797) with Resource kit associated with education NXT Softwares, NI WSN Starter kit, NXT sensors and Raspberry Pi 3. New Fire Bird V ATMEGA2560 Robot Research Platform has also been acquired which is a standard AVR microcontroller based Fire Bird V which is fitted with Raspberry-Pi SBC (Single Board Computer) and higher resolution encoders. The lab is also facilitated with CSL workstation, headphones and speakers.

**Open Source Intelligence Group Laboratory:** The objective of OSINT Lab is to mine and discover actionable intelligence for various application from publicly available information such as social media platforms, news feeds, microblogging sites etc. The group actively involves in a wide ranges research problems related of text mining, NLP, social media data mining, social network analysis, information retrieval etc. over social media data.

OSINT lab is an interdisciplinary Lab with collaborators from the domains of machine learning, information retrieval, information security, computational linguistics, user interface design and visualization. The lab is equipped with state-of-the-art facilities with high-end CPU and GPU computing servers, 100TB of NAS storage, distributed Spark clusters, distributed NoSQL databases. The Lab has executed various sponsored projects. It curates and archives a large volume of social media data at the scale of more than 200 billions microblogs (tweets, news articles, Facebook posts). It has developed tools for analysing social media data (Vishleshakee), event detection from news feeds, OCR for Manipuri Language, Manipuri Text-to-Speech synthesis system, Sentiment analysis system for public opinion. Some of the products developed in the Lab are used by the companies like Lamzing Technologies Pvt. Ltd. It also

involves in various outreach activities – development of POS and NER for Dzongkha, 100+ interns to students from different Engineering institutions in North East.

**Computer Networks & Security Laboratory:** The CNS research group at IIT Guwahati works on projects that cover a diverse range of experimental and theoretical research, including Wireless Mesh, Ad Hoc and Sensors Networks, High Speed Networks, Network Architecture and Design, Computer and Network Security, Secure Multimedia Communications and Intrusion Detection Systems.

The researches aim at developing low cost and effective solutions for communication and media technology with a focus of blooming technologies for Indian context, specifically the North East Region. At the same time, our theoretical research targets the global developments of networking and security technologies, standards and policies while addresses the design of future network architecture.

**User-centric Computing and Networking Laboratory:** The lab focuses on the design and development of applications for computing devices that caters to heterogeneous user groups. The user-centric computing paradigm (otherwise known as the human-computer interaction) is applied in the design of applications used in large-scale content delivery, to ensure good quality of experience to the consumers on heterogeneous devices and networks. The challenges that arise in the development of user-centric networked applications are addressed both from theoretical as well as practical perspectives.

This lab is equipped with Mavic Air 2 Fly More Combo Drone, Mavic mini drone, RICOH Theta Z1 360° Camera, Leap Motion, Oculus Rift, Oculus Quest 2 Virtual Reality Head Mounted Display, Epson Moverio BT35E smartglass, Data gloves, Microsoft kinect sensor, 360 degree Camera, Tobii eye tracker (model: X2-60) and associated software for usability studies, Mobile Devices (Android, iOS, Windows), Laptops, Tablets, Smart Phones, SDK Tools for Android, iOS, Windows Application Development, Desktop PCs, High performance computing servers, Wireless and Wired Gigabit Routers, Reconfigurable routers (built using 1Gbps Digilent NetBest viewed in Internet Explorer 9.0 & above or Mozilla Firefox Ver 3 & above with a resolution of 1024 X 76800.FPGA Cards)..

**Computer Architecture & Embedded Systems Laboratory:** The lab focuses on cutting edge research and technology innovation in the area of VLSI design, testing, verification, real time systems and scheduling, NOC design, multicore architecture and scheduling and cache design for multicore.

Embedded System Development Software, Chip Scope-Pro Software, Virtex-II Pro based Protoboard with FPGA, Virtex-5 Development Board with device XC5VLX50 and VIDEO ADC–DAC Add On Card, Universal Multi-vendor Kit with on board device XC3S400 PQ208C, Simics-4.0.61, Xilinx- ISE Design Suite, Embedded System Development Software (UEFi\_EDK) & Chip Scope-Pro Software(UEF-CSP-PRO), ISE Design Suit,Basys3 FPGA BOARD etc. Under the VLSI laboratory in our department to inculcate student interest in VLSI design, test and verification and facilitating students to build prototype designs and test them.

**Hardware Laboratory:** The Department hardware laboratory is equipped with educational tools to promote better understanding of computer hardware and peripherals among the students. 8085/86 Microprocessor Trainer kits and 8031 Microcontroller kits are used to provide hands on experience to students about basic hardware. This Lab also provide space for various research cum major/minor project to be carried out.

New PIC based microcontrollers and FPGA boards have also been acquired. These are supported by Colour Logic Analyzer and Pattern Generator, Function/Arbitrary wave generator, digital oscilloscopes, Wireless Transmitter/Receiver pairs, Data acquisition/ Switch units, TDM pulse code modulator/transmitter and demodulator/receiver, various Software tools likeXilinx evaluation kits, various Architectural Tools and Simulators, Development kits with DE1-SOCMLT2 etc

**Samsung Innovation Laboratory:** This Lab facility was set-up under MOU with SIEL - Samsung India Electronics Private Limited. This facility emphasis on academic collaboration by way of special industry oriented courses, jointly by IITG & SIEL, technical talks & industry expert lectures/demonstrations, minor/major student projects & student technical contests, Research activity mainly engrossed with IoT & Networking.

The Lab is equipped with RASP-PI-3 Motherboard , Wifi Router, High end GPU Servers, Quad Store QS\_URPI Ultra Kit for Raspberry Pi 3, 2, LoraWan Gateway, Lora modules Arduino Shields , Sensing module kit for measuring Temp, Humidity, etc., Smart Display etc.

**MARS Research Laboratory:** This Lab designated with research in the area of Multicore Architecture and Systems like Optimising Network On Chip Architecture, Cache Optimisation in Tiled Chip Multi-Processors (TCMP), Machine Learning based accelerators for NoCs, enhancing Non-Volatile Memory (NVM) Technology, Secure System on Chip Design Techniques,

Disaggregated Memory Management in Data Center Architectures, Performance Enhancement in Wireless Network On Chips, etc.

This Lab Facilitated with Server, Workstations, High-end Desktops, Xilinx evaluation kits, various Architectural Tools and Simulators, Development kits with DE1-SOCMLT2, etc.

**3 Nos. UG Soft Laboratory, 2 Nos. PG Soft Laboratory, 3 Nos. Research Scholar Laboratory:** These Labs are designated computing Facility for B.Tech , M. Tech Students & Research Scholars. These are 24x7 Lab facilities; one workspace allocated to each student. Major activities of these Labs are Soft Project, Tutorials, BTP & MTP, Individual research works by Ph. D. Students etc.

All workspace are equipped with N/W cum Wi-Fi facility, High-end Desktop cum other computing Facility, IBM Rational Rose software development suite, Oracle RDBMS with Oracle products and Oracle Academic Initiative, Java compiler and applet viewer, C++ compilers and Lisp interpreters, Rational rhapsody developer, Matlab , Solaris both SPARC and X86 versions, etc.

**SUSMA Laboratory:** This Lab is designated with research in the area of computer architecture like improving performance and lifetime of the emerging non-volatile memories, NoC architecture optimization, accelerator design for machine learning applications.

This Lab is facilitated with server, workstations, architectural tools and simulators etc.

**AVS (Automation, Verification, and Security) Laboratory:** This Lab is designated with research in the area of compiler security, hardware security, logic locking, formal verification, and high level synthesis.

This lab is facilitated with workstations.

**AMaL Laboratory:** The lab focuses on applying Machine Learning algorithms for various real world problems. Primarily, it focuses on Natural Language Processing and Computational Biology, excelling in Biomedical Text Mining, Multilingual Named Entity Recognition, Relation Extraction, and Event Extraction. The lab also explores Programmatic Weak Supervision techniques and delves into Argument Mining, collectively driving advancements at the intersection of language and technology.

The lab facilities include GPU workstations, NAS server and High-end computing.

### **HPC Laboratory**

**IoV Laboratory:** The lab specializes in Vehicular Communication, optimization problems, and resource allocation in V2X communication. This lab also addresses security breaches in C-V2X (4G, 5G, 6G) networks and optimizes power and energy in UAV communication.

This lab is facilitated with workstations.

**Internet of Things (IoT) Laboratory:** The collection of devices communicating together forms the Internet of Things (IoT) network. Researchers of this lab work on various aspects of IoT networks. Some of them are IoT network security, device authentication, standards and protocols, enhancement of existing functionalities and features, new functionality and feature development to cater to the evolving industry and government requirement.

This lab is facilitated with workstations, testbeds, testbed equipments, diverse microcontrollers, diverse sensors and actuators, IoT course experimental setups, and other IoT related and testbed required equipments.

#### MAJOR EQUIPMENT AND FACILITIES ACQUIRED

Sl. No.	Equipment / Facility
1	Mavic Air 2 Fly More Combo
2	MAVIC MINI
3	RICOH Theta Z1 360° Camera
4	Oculus Quest 2
5	Samsung Galaxy S20 Ultra 5G
6	LEAP Motion

#### MAJOR AREAS OF RESEARCH AND DEVELOPMENT

Sl.No.	Area	Faculty Involved
1	Internet of Things, Wireless Networks, Sensor Networks, Network Security, Cloud and Edge Computing, Cyber Physical Systems	Dr. Manas Khatua
2	Network on Chip (NoC) and Cache Optimisation in Tiled Chip Multi-Processors (TCMP), Wireless On Chip Interconnects and Edge/Fog Computing, Machine Learning based Domain Specific Accelerators for NoCs, Non-Volatile Memory (NVM) Technology, Secure System on Chip Design Techniques, Disaggregated Memory Management in Data Center Architectures	Dr. John Jose
3	Virtual and augmented reality Smart interactive environments Affective interaction Mobile HCI E-Learning interfaces and interaction User-centric computing	Dr. Samit Bhattacharya
4	Theoretical Computer Science	Purandar Bhaduri, Jatindra Kumar Deka, Diganta Goswami, R. Inkulu, Benny George K, Chandan Karfa, Sushanta Karmakar, Deepanjan Kesh, Pinaki Mitra, S. V. Rao
5	Computer Architecture and Embedded Systems	Sukanta Bhattacharjee, Jatindra Kumar Deka, John Jose, Hemangee K. Kapoor, Chandan Karfa,

Sl.No.	Area	Faculty Involved
		Sukumar Nandi, Aryabartta Sahu
6	Man-Machine Interfaces	Sukanta Bhattacharjee, Samit Bhattacharya, Pradip Kr. Das, Shivashankar B. Nair, V. Vijaya Saradhi
7	Computer Systems	Diganta Goswami, John Jose, Sushanta Karmakar, Manas Khatua, Pinaki Mitra, Sukumar Nandi, Moumita Patra, S. V. Rao, Aryabartta Sahu, G. Sajith, Arijit Sur, Tamarapalli Venkatesh
8	Artificial Intelligence, Machine Learning and Data Mining	Ashish Anand, Amit Awekar, Rashmi Dutta Baruah, Manas Khatua, Sukumar Nandi, Moumita Patra, V. Vijaya Saradhi, Sanasam Ranbir Singh, Arijit Sur

#### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty Prof./Dr. (Name) (Surname)	Name of Conf./Workshop	Place	Date	Internati onal/ National
1	Prof. T. Venkatesh	ACM/IEEE Embedded Systems Week (ESWEEK)	Hamburg, Germany	18/9/2023- 20/9/2023	Internatio nal
2	Dr. Moumita Patra	Workshop on Present and Future Computing Systems	Indian Institute of Science (IISc), Bangalore	12/1/2024- 15/01/2024	
3	Dr. Moumita Patra	Workshop on Developing a Robust and Secure Routing Algorithms for real time Vehicular Networks	National Institute of Technology (NIT) Calicut	08/01/2024 - 14/01.2024	

Sl. No.	Name of Faculty Prof./Dr. (Name) (Surname)	Name of Conf./Workshop	Place	Date	International/National
4	Dr. Hemangee K. Kapoor	23rd IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid) 2023	BANGALORE, INDIA	MAY 1-4, 2023	International
5	Dr. Hemangee K. Kapoor	CODS-COMAD 2023	IIT Jodhpur	18-21 December, 2024	National
6	Dr. Hemangee K. Kapoor	23rd International Conference of Embedded System Design" (VLSID 2024)	ITC Royal Bengal, Kolkata, India	6-10 January 2024	National
7	Dr. John Jose	ACM/IEEE Embedded Systems Week (ESWEEK)	Hamburg, Germany	18/9/2023-20/9/2023	International
8	Dr. John Jose	6th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip	Singapore	18/12/2023 - 21/12/2023	International
9	Dr. John Jose	IEEE Region 10 Technical Conference	Chiang Mai, Thailand	31/10/2023 - 3/11/2023	International
10	Dr. John Jose	23rd International Conference of Embedded System Design" (VLSID 2024)	ITC Royal Bengal, Kolkata, India	6-10 January 2024	National
11	Dr. Chandan Karfa	ISVLSI 2023 : IEEE Computer Society Annual Symposium on VLSI	Iguazu Falls, Brazil	Jun 20, 2023 - Jun 23, 2023	International
12	Dr. Chandan Karfa	23rd International Conference of Embedded System Design" (VLSID 2024)	Kolkata India	45299	International
13	Dr. Aryabartt Sahu	<i>IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid) 2023</i>	Bangalore, India	1-4 May 2023	International



**INVITED LECTURES OF FACULTY: IN INDIA, ABROAD**

Sl. No.	Name of Faculty Prof./Dr. (Name) (Surname)	Name of Lecture	Name of Inst./Org.	Place	Date
1	Dr. Moumita Patra		NIT Goa	Goa, India	1 Nov 23
2	Dr. Moumita Patra		Heritage institute of technology Kolkata	Kolkata, India	November-2023, March-2024
3	Dr. Hemangee K. Kapoor	CCGRID 2023: A Holistic Approach to Inclusion and Belonging	CCGRIGD 2023	BANGALORE, INDIA	1 MAY, 2023
4	Dr. Hemangee K. Kapoor	DEI activities at the ACM and How to make CS education more inclusive	ACM COMPUTE 2023	Manipal University, Jaipur	November 2023
5	Dr. Hemangee K. Kapoor	DEI activities at the ACM and How to make CS education more inclusive	CODS-COMAD 2023	IIT Bombay	18 December, 2023
6	Dr. John Jose	Effective Prefetching and Data Placement Techniques for Multicore Edge Systems	University of Catania	Italy	25 Septemeber, 2023
7	Dr. John Jose	Data Aware Co-Design of Caches and Interconnects for Multicore Processors	National University of Singapore	Singapore	18 December, 2024
8	Dr. Chandan Karfa	Invited talk on “Is your Compiler Secure?”	VLSID 2024	Kolkata, India	45301
9	Dr Chandan Karfa	Expert Lecture on “Open Source HLS tools” in OpenROAD for low-cost ASIC design and Rapid Innovation”	NINE Lab, IIT Guwahati	Guwahati, India	
10	Dr Chandan Karfa	Invited Talk	International Conference on Devices, Sensors and Systms. Tezpur University	Tezpur, India	45333
11	Dr Chandan Karfa	“Security Aspect in Healthcare Devices”	SERB DST Sponsored Workshop “Secuiry and Privacy in Healthcare devices” IIIT Guwahati	Guwahati, India	45239
12	Dr Chandan Karfa	How to Protect your iP from Piracy	IIIT Guwahati	Guwahati, India	45029

<b>Sl. No.</b>	<b>Name of Faculty Prof./Dr. (Name) (Surname)</b>	<b>Name of Lecture</b>	<b>Name of Inst./Org.</b>	<b>Place</b>	<b>Date</b>
13	Dr. John Jose	Role of Multicore Processors in Machine Learning Applications	Bharata Mata College, Kochi	Kerala, India	16 Nov 23
14	Dr. John Jose	Data-Aware Network-on-Chip for High End Computing Systems	IISc, Bangalore	Bangalore, India	4 Aug 23
15	Dr. John Jose	High Performance Computer System	Dr. BC Roy Engineering College, Durgapur	West Bengal, India	22/03/2024
16	Dr. John Jose	High Performance Computer System	Heritage institute of technology Kolkata	West Bengal, India	21/03/2024
17	Dr. John Jose	High Performance Computer System	Netaji Subhash Engineering College	West Bengal, India	20/03/2024
18	Dr. John Jose	Securing Hardware: Challenges and Opportunities	R. V. College of Engineering	Bangalore, India	12/10/2023
19	Dr. John Jose	How to plan your college days for a professionally rewarding career?	Viswajyothi College of Engineering and Technology	Kerala, India	28/04/2023
20	Dr. John Jose	Participatory Leadership : A Way to Sustainable Excellence		Shillong, India	05/05/2023
21	Shivashankar B. Nair	AI: Inspirations from Nature	RUSA 2.0 Approved Short term Course on Artificial Intelligence, Machine Learning Automation, Robotics Future of Work & Humanity, Gauhati University	Guwahati, India	01/03/2023
22	Shivashankar B. Nair	Learning: Inspirations from Nature	International Research Workshop on Advances in Deep Learning (WADLA-3.0) December 11-16, 2023, IIT Sri City, Chittoor	Chittoor, India	14/12/2023

<b>Sl. No.</b>	<b>Name of Faculty Prof./Dr. (Name) (Surname)</b>	<b>Name of Lecture</b>	<b>Name of Inst./Org.</b>	<b>Place</b>	<b>Date</b>
23	Shivashankar B. Nair	Immuno-inspirations	Keynote, International Conference on Advanced Communications and Machine Intelligence, 2023	Agartala	01/11/2023
24	Shivashankar B. Nair	The Immune Network	Keynote, Second International Conference on Emerging Trends in Information Technology and Engineering(ic-ETITE'24) Technically co-sponsored by IEEE Madras Section,February 22-23, 2024	Vellore, India	23/02/2023
25	Shivashankar B. Nair	The Immune Network - Robotic Implications	IGSTC Sponsored Indo-German Workshop on Frontiers of Robot Learning, IIT Bombay 4-6th March 2024	IIT Bombay, Mumbai	04/03/2024
26	Shivashankar B. Nair	AI Inspirations from Nature	Workshop on skill development on Artificial Intelligence (AI) and Machine Learning (ML), IIIT Manipur, funded by the Ministry of MSME	IIIT Manipur, Imphal	15/03/2024
27	Shivashankar B. Nair	Inspirations from Nature	Science Day, Arya Vidyapeeth College (Autonomous), Guwahati	Guwahati, India	14/03/2024

**VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES**

Sl. No.	Name Prof./Dr. (Name) (Surname)	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date D/M/Y
1	Prof. V. Ramgopal Rao	BITS Pilani	Leveraging The National Semiconductor Mission to Promote Deep-Technology Innovations in Academia	23/06/2023
2	Dr. Sandipan Sarkar	IBM	Modern Data Architecture	24/06/2023
3	Prof. Sukumar Mishra	IIT Delhi	GFL to GFM : A Paradigm Shift in the Context of Renewable Rich Micro Grid.	24/06/2023
4	Mr. Sumit Goswami	Qualcomm	Achieving Power Efficiency on Device AI	24/06/2023
5	Prof. Krishna M. Sivalingam	IIT Madras	On Programmable Data Plane Network Switches and their Applications	25/06/2023
6	Prof. Ajit Kumar Chaturvedi	IIT Kanpur	Deep Learning for Wireless Communications	
7	Prof. Sugata Gangopadhyay	IIT Roorkee	Introduction to Quantum Computing	23/06/2023
8	Dr. R Lenin Raja	EMC Test & Training Center Pvt. Ltd.	Recent Technologies changes in IoT & 5G implementations and It's Industrial Market Demands	23/06/2023
9	Prof. Antony Franklin	IIT Hyderabad	How to Write Good Project Proposals for Research Funding?	16/03/2024
10	Prof. Sivaji Chakravorti	Jadavpur University	Useful Pointers and Ethics in Writing a Good Technical Paper	15/03/2024
11	Dr Prashant Goswami	BTH Sweden	Real-Time Fluid Animations in Computer Graphics	07/03/2024

**SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED**

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.) Prof./Dr. (Name) (Surname)	Name of Sem./Wor./Con.	Funded By	Date D/M/Y	International/ National
1	Dr. Moumita Patra	Workshop on Pedagogy Training for Teaching and Research Excellence	SERB-INAE	15-16 March 2024	
2	Dr. Manas Khatua	Seven day high-end Workshop on "Power Electronics Hardware Design with Microcontroller Programming"	SERB, India under the Accelerate Vigyan scheme	20-30 June 2023	
3	Dr. John Jose	Workshop on Pedagogy Training for Teaching and Research Excellence	SERB-INAE	15-16 March 2024	
4	Dr. John Jose	IEEE GCON 2023	IEEE Guwahati Subsection, ISE A, Qualcomm, CDAC	23-25 June 2023	National
5	Dr. John Jose	InSiG 2023		28 September - 01 October 2023	

**AWARDS AND HONOURS**

- Dr. Hemangee K. Kapoor: Best Paper Award; VLSI Design Conference 2024.
- Dr. John Jose: COMSYS Young Achievers Award; COMSYS Educational Trust.
- Dr. John Jose: Best Paper Award; CASES @ESWEEK.
- Dr. John Jose: Vice Chair; IEEE India Council.
- Dr. Hemangee Kapoor: Council Member; International ACM Council on Diversity, Equity and Inclusion.

**STUDENTS' ACHIEVEMENTS**

- Zeeshan Anwar; Imlijungla Longchar: Best Paper Award; VLSI Design Conference 2024.
- Praveen Karmakar: HeLLO CTF' 22 2nd Position; Competition of Hardware Locking Logic Obfuscation.
- Dipika Deb: Best Paper Award; CASES @ ESWEEK.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/OrgPhD degree received from	Designation	Areas of Interest
1	Ashish Anand	Nanyang Technological University, Singapore	Associate Professor	NLP, Clinical Text Mining, Machine Learning and its application in computational biology, Deep Learning
2	Amit Awekar	North Carolina State University	Associate Professor	Data Mining, Natural Language Processing
3	Rashmi Dutta Baruah	Lancaster University, United Kingdom	Assistant Professor	Evolving and Adaptive Intelligent Systems, Computational Intelligence, Learning from Data streams, Deep Learning, Explainable AI and Model Interpretability
4	Purandar Bhaduri	Washington State University, Pullman	Professor	Formal Verification of Reactive Systems, Automated Controller Synthesis, Logic and Semantics of Computation
5	Sukanta Bhattacharjee	ISI Kolkata	Assistant Professor	Design Automation Algorithms, Microfluidics, Security
6	Samit Bhattacharya	IIT Kharagpur	Associate Professor	Human Computer Interaction, User Modeling, Model Based Evaluation of Interactive Systems, Rehabilitation Engineering
7	Pradip Kr. Das	University of Delhi, New Delhi	Professor	Speech Processing, Man-Machine Intelligence Systems, Algorithms, Software Engineering, Smart Devices, Mobile Robotics
8	Jatindra Kumar Deka	IIT Kharagpur	Professor and Head	Formal Modelling and Verification, CAD for VLSI and Embedded Systems (Design, Testing and Verification)
9	Diganta Goswami	IIT Kharagpur	Professor	Distributed Systems, Software Engineering
10	R. Inkulu	University of Texas Austin	Associate Professor	Algorithms

Sl. No.	Name	Name of the University/Institute/OrgPhD degree received from	Designation	Areas of Interest
11	John Jose	IIT Madras	Associate Professor	Computer Architecture, On-chip Storage and Interconnects, Hardware/IoT Security, Disaggregated Systems, Edge Device Computing
12	Benny George K	TIFR Mumbai	Assistant Professor	Word combinatorics, algorithms and combinatorics
13	Hemangee K. Kapoor	London South Bank University, UK	Professor	Multiprocessor Computer Architecture, Formal Methods, Network-on-Chip design, Asynchronous systems
14	Chandan Karfa	IIT Kharagpur	Associate Professor	Formal Verification, High-level Synthesis, Electronic Design Automation, Hardware Security, Verification of Compiler Optimizations.
15	Sushanta Karmakar	IIT Kharagpur	Professor	Graph Algorithms, Distributed Optimization
16	Deepanjan Kesh	IIT Kanpur	Associate Professor	Data Structures and Algorithms
17	Manas Khatua	Indian Institute of Technology Kharagpur	Assistant Professor	Internet of Things, Wireless Networks, Sensor Networks, Network Security, Cloud and Edge Computing, Cyber Physical Systems
18	Pinaki Mitra	Simon Fraser University, Canada	Associate Professor	Computational Geometry, Parallel Algorithms, Randomized Algorithms, Optimization
19	Shivashankar B. Nair	Amravati University, Maharashtra, India	Professor	Artificial Intelligence, Intelligent and Nature-Inspired & Emotional Robots, Mobile Agent based systems, Artificial Immune Systems, Intelligent Internet of Things, Cyber-Physical Systems, Natural Language Processing, Genetic

Sl. No.	Name	Name of the University/Institute/OrgPhD degree received from	Designation	Areas of Interest
				Algorithms, Fuzzy Systems & Neural Networks
20	Sukumar Nandi	IIT Kharagpur	Professor	Computer Networks, Computer and Network Security, Data mining, Machine Learning, VLSI, Computer Architecture, Computational Linguistics
21	Moumita Patra	IIT Madras	Assistant Professor	Wireless networks, Internet of vehicles, IoT, 5G based communication, Network performance analysis
22	S. V. Rao	IIT Kanpur	Professor	Wireless Networks, Software Defined Networking, Algorithms
23	Aryabartta Sahu	IIT Delhi	Associate Professor	Multicore (Architecture, Scheduling and Programming) and Computational Social Systems
24	G. Sajith	IIT Kanpur	Professor	External Memory Algorithms, Algorithmic Game Theory, Parallel and Distributed Algorithms, Complexity Theory
25	V. Vijaya Saradhi	IIT Kanpur	Associate Professor	Machine Learning, Kernel Methods, Data Mining and their applications
26	Sanasam Ranbir Singh	IIT Madras	Professor	Open Source Intelligence (Social Media/Social Network Analysis), Information Retrieval, NLP
27	Arijit Sur	IIT Kharagpur	Professor	Computer Vision using Deep Learning: Machine learning, Adaptive video streaming, Media Forensics
28	T. Venkatesh	IIT Madras	Associate Professor	Network Protocols and Architectures, Cloud Data Centers, Multimedia Streaming



Design

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT:** 1998

**ACADEMIC PROGRAMMES OFFERED:** B.Des , M.Des , Ph.D., Post-Doctoral

## **LABORATORY FACILITIES**

### **I. Ergonomics Laboratory**

Ergonomics laboratory at Department of Design, IIT Guwahati was set-up in 1999 under leadership Prof. Debkumar Chakrabarti. This is a well-equipped laboratory with various basic and applied research facilities for both physical and cognitive ergonomics. Apart from equipment for traditional ergonomics evaluation, modern sophisticated equipment are available for virtual ergonomics evaluation and cognitive workload study. Two (02) faculty members (Prof. S. Karmakar, and Dr. U.R. Salve) and 10 PhD students are currently associated with this laboratory. Facilities available in the laboratory include (a) Anthropometric measurement kit, (b) Equipment/ tools for biomechanical analysis, (c) Kit for environmental variable measurement, (d) Tools/equipment for cognitive workload analysis, (e) Digital human modeling software for virtual ergonomics evaluation, (f) Eye-tracker for visual attention analysis, and (g) Equipment for physiological variable analysis (ECG, EMG, EEG etc.).

### **II. Sustainability and social Innovation Lab**

Design for Sustainability (DfS) is an emerging and significant domain. It is also one of the prime needs of the hour considering the burden of human consumption and production. In order to create sustainable human consumption and production, a complete revamp of the consumption structure is needed. Through the SSI Lab, the Department of Design at IIT Guwahati, aims to foray into this domain.

Vision - To promote and contextualize sustainability through R&D along the three pillars of sustainability: social, economic and environmental.

The objective of the lab are:

- To provide infrastructure and guidance to student projects related to DfS.
- Conduct training sessions for interested local institutions and bodies in the application of DfS.
- Research into DfS, Sustainable Frugal Design & developing case studies in DfS through execution of projects.
- Development of course material related to DfS.
- Developing tools & methodologies for the implementation of DfS in the emerging, marginalized & industrialized contexts.

### **III. Workshop**

An industrial design group is always incomplete without a well-equipped workshop. Department workshop consists of advanced prototyping machines like rapid prototyping tool, blow moulding machine, metal and prototyping equipment such as wood, bamboo, plastic, metal etc. which are actively made use of by students and staff.

### **IV. Media Lab**

Multimedia and visual communication are integral streams of department of Design. Equipped with professional softwares like Final Cut Pro and advanced video-graphy studios, New Media lab has witnessed many marvellous projects in the field of animation, multimedia and digital art.

### **V. Design Futures Studio (previously named as E-Kalpa lab)**

DFS is a design studio space with a focus on design-led applications and research. The studio has active design and research projects in diverse areas, including designing for Human-Centered Design interactive systems, designing for special populations of children and elderly, and interaction design for Electric

Vehicles. In DFS, design problems drive use of specific technologies and strategies to generate meaningful design outcomes.

In-charge: Abhishek Srivastava

#### **VI. Multimedia Animation Communication**

Laboratory of Visual Ethnographers, Animation Research Lab (ARLab), is a research & practice based model in which one can figure out the possibilities of using animation with its artistic endless potential and possibilities. This model emphasizes on the ethnographic approaches of cultural construction and interpretation, biographies of objects, participatory approaches etc. of tribes and indigenous communities. Besides research-based ethnographies, we investigate the artistic possibility of animation techniques to measure user performance & acceptance in variety of research domain like edutainment, heritage construction, animatronics, gamification, healthcare and architecture.

In-charge: Dr. Manoj Majhi

#### **VII. Visual Communication studio**

VC Studio aims to be a centre for excellence in the field of visual communication design in Northeast region.

It was started with the following objectives:

Nurture innovation and creativity in the field of visual communication.

Create design awareness and enhance visual sensitivity towards visual culture in the Northeast.

Develop a state of the art facility to support design and research in visual communication.

Cultivate visual research culture among students.

Train and develop visual and visualization skills for better communication.

In-charge: Prof. D.Udaya Kumar

#### **VIII. Computer Lab**

#### **IX. Usability Engineering and HCI Lab**

#### **X. Product Design & Development Studio**

#### **XI. Material lab**

#### **XII. Visualization lab**

#### **XIII. Photographic Lab**

#### **XIV. Embedded Interaction lab**

#### **XV. 3 D Printing Lab**

#### **XVI. Master Craftsman Lab**

#### **XVII. Fine Mechanics and Product Development Lab**

## MAJOR EQUIPMENT AND FACILITIES ACQUIRED

3D Scanner, CNC Milling Machine, Laser Cutting Machine, 3D Printer FDM, Electronic Workbench, 3D Printer SLA, Vinyl Cutting Plotter, Magic Leap, Touch X Haptic Suit, VR Headset, HoloLens.

## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

1. **Acharya, S.**, (2024, *in print*). The ‘D’ in Design – What drives design students *In: Editor, Chakrabarti, A., Singh, V., and Acharya, S (Eds.), The Future of Design Education - Proceedings of InFuSED’23*. Springer Nature Singapore.
2. [Book] Chakrabarti, A., Singh, V., and **Acharya, S.,Ed.**, (2024, *in print*). The Future of Design Education – Proceedings of InFuSED’23. Springer Nature Singapore.
3. Pramanik, S., Pabbathi, S., **Acharya, S.**, (2024, *accepted*). Exploring Gesture generation for smartwatches : Is user elicitation enough?. *In Proceedings of the DESIGN 2024 18th International Design Conference (DESIGN24)*, Dubrovnik, Croatia.
4. **Acharya, S.**, (2024, *accepted*). Design for the Real world – A Problem-based Learning approach. *In Proceedings of the DESIGN 2024 18th International Design Conference (DESIGN24)*, Dubrovnik, Croatia.
5. [Book] **Acharya, S.**, (2023) Civil Engineering - Societal & Global Impact, AICTE-Technical Book for 4th Semester Engineering, All India Council for Technical Education. New Delhi. (ISBN 978-81-963773-7-3)
6. **Acharya, S.**, Bhatt, A.N., and Chakrabarti, A., (2023). Problem based Learning through Design Thinking to strengthen education in South Asia. *In Proceedings of the Design Society: International Conference on Engineering and Product Design Education (E&PDE23)*, Spain.
7. Venkatesh, K., and **Acharya, S.** (2023). From an individual to the institute: A case of ‘Multi-user Centric Codesign’ approach in designing solutions for children with special needs in resource-constraint settings. *In Proceedings of the Design Society: International Conference on Engineering and Product Design Education (E&PDE23)*, Spain.
8. Venkatesh, K., and **Acharya, S.**, (2023). ‘indriya’ - Participatory design of a multi-sensory learning aid for children with communication disorder. *In International Conference on Engineering Design (ICED23), France, Proceedings of the Design Society, 3, 9-18.*
9. Jurelionis, A., Stankeviciute, G., Dhital, A., van Andel, E., Sundman, J., Stasiulienė, L., **Acharya, S.**, Subra, R., (2023). Exploring the impact of Problem-based learning on student learning outcomes: Findings from the PBL South Asia project. *In Proceedings of SEFI Annual Conference 2023 on Engineering Education for Sustainability, Dublin.*

## CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
01	Dr. Santosh Jagtap (1 Paper)	International Conference on Engineering Design, Bordeaux, France.	Bordeaux, France.	24 - 28 July 2023	International
02	Dr. Santosh Jagtap (1 Paper)	International Conference on Advances in Science and	Mumbai, India.	8-9 December 2023	International

		Technology, IEEE-ICAST 2023, Mumbai, India.			
03	Dr. Santosh Jagtap (2 Papers)	International Conference on Transformations in Engineering Education (ICTIEE – 2024), Hubballi, India.	Hubballi, India.	2-4 January 2024	International
04	Dr. Shakuntala Acharya	‘1st Indian Summer School on Design Research – DRM GURUKOOLL’	Indian Institute of Science (IISc), Bangalore, India	01-08 JUL 2023	National
05	Dr. Shakuntala Acharya	International Conference on Engineering Design (ICED23),	Bordeaux, France	24-28 JUL 2023	International
06	Dr. Shakuntala Acharya	Design Society: International Conference on Engineering and Product Design Education (E&PDE23)	Barcelona, Spain.	06-08 SEPT 2023	International
07	Prof. Sougata Karmakar	35th Biennial Conference of Home Science Association of India (HSAI)	Meghalaya, India	17-19 January 2024	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Dr. Sharmistha Banerjee	Sustainable Electronic Product Design	IIT Guwahati	Guwahati	06/02/2024
02	Dr. Sharmistha Banerjee	Human Computer Interaction Design for the India’s 1.4 billion	NID Bangaluru	Bengaluru	15/09/2023
03	Dr. Sharmistha Banerjee	Creative Brainstorming	IIT Guwahati	Guwahati	13/07/2023
04	Dr. Sharmistha Banerjee	Panel discussion on Green Energy - Innovations and Opportunities	Youth20 consultation under the G20 program at University of Kashmir	Srinagar	11/05/2023
05	Dr. Shakuntala Acharya	Summer School Lecture on “Design for Sustainability”; “Design Research” and “Qualitative Methods of Research”	Indian Institute of Science (IISc)	Bangalore, India	01-08 July 2023
06	Dr. Shakuntala Acharya	Invited Keynote speaker at ‘First Design Conference’ hosted by	National Institute of Design MP	Bhopal, MP	16 /12/2023
07	Prof. Sougata Karmakar	Design Education and Research: A perspective of IIT Guwahati	<i>Faculty of Architecture and Planning, DALHOUSIE UNIVERSITY, Canada</i>	Halifax, NS B3H 4R2 Canada	17/07/2023

08	Prof. Sougata Karmakar	Tools and techniques to assess and control hazards in farm occupation	College of Community Science, Assam Agricultural University	Jorhat-785013, Assam	10/01/2023
09	Prof. Sougata Karmakar	Occupational stress: causes, measurements and remedies	College of Community Science, Assam Agricultural University	Jorhat-785013, Assam	09/01/2023
10	Prof. Sougata Karmakar	Fundamentals of Ergonomics	DJ Academy of Design,	Coimbatore	07/09/2023
11	Prof. Sougata Karmakar	Ergonomics in Product Design and Development	Innovation, Design and Entrepreneurship (IDE) Bootcamp	IIT Guwahati	23/06/2023
12	Prof. Sougata Karmakar	Ergonomics/ Human Factors in Design	<i>Dept. of Design, IIT Roorkee</i>	IIT Roorkee	10/07/2023
13	Prof. Sougata Karmakar	Human Factors in Design	<i>Royal School of Design, Royal Global University</i>	Guwahati, Assam	13/12/2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date
01	Mr. Jayant Karve	RCupe Lifesciences Bangalore	Bench to Bedside: Bridging the Gap in Medical Innovation	9 <sup>th</sup> October 2023
02	Prof. Balakrishnan Prithiviraj	Associate Vice President (Global Relations), Government and Global Relations, DALHOUSIE UNIVERSITY, Canada	Interaction with faculty members and visiting labs/ studios	1 <sup>st</sup> March 2024
03	Mrs. Megan Chipp	Manager, Global Partnerships Government and Global Relations, DALHOUSIE UNIVERSITY, Canada	Interaction with faculty members and visiting labs/ studios	1 <sup>st</sup> March 2024
04	Mr Khagen Goswami	Samoguri Satra, Majuli, Assam	Reinventing Traditional Mask Making Craft of Majuli: An Innovative Design Approach	15-17 <sup>th</sup> February 2024
05	Kumar Ahir	Design Leader at CISCO, AR VR Evangelist, Sketchnoter Bengaluru, Karnataka, India	Exploration of Virtual Reality Techniques from Design Perspective	11-13 <sup>th</sup> March 2024

06	Mr. Bharat Bhusan, Mr Shrey Sharma, Mr Dhana Sekaran, Sanjeev Chugh, Mr Bikash Jyoti Biswas, Mr Ashisy Jayawal, Saurabh Singh, Mr Sathiya Seelan, Mr Kartike Karwal	Society of Indian Automobile Manufacturers (SIAM)	Interaction with faculty members and students	27 <sup>th</sup> September 2023
07	Dr. Satya Gupta	VLSI Society of India, Ex-Chairman, IFSA, CEO, EPIC	Scope and opportunities for Electronics Product Design students in semiconductor industries	16 <sup>th</sup> March, 2024
08	Mr. Chandrashekhar Wyawahare	Futuring Design, Pune	Futuristic design ideas for Electronics Product Design	8-9 <sup>th</sup> March, 2024

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Dr. Sharmistha Banerjee	A five-day Executive Development Program on "Design for Sustainability"	MEITY sponsored Project of Electronic Product Design	21-25 <sup>th</sup> February 2024	National	20
02	Dr. Sharmistha Banerjee	A five-day Executive Development Program on "Design for Sustainability"	Paid by participants	21-25 <sup>th</sup> February 2024	National	10
03	Dr. Sharmistha Banerjee	A five-day workshop on "Design for Sustainability"	Paid by participant	25-29 <sup>th</sup> September 2024	National	20
04	Dr. Santosh Jagtap	Workshop topic: Design thinking	Swedish Research Council, Sweden	25-26 <sup>th</sup> October 2023	National	86
05	Dr. Santosh Jagtap	A one-day workshop on "Ideas to Impact: Design for Low Resource Settings and Design-driven Innovation"	Design Innovation Centre (DIC)	6 <sup>th</sup> February 2024	National	26
06	Dr. Shakuntala Acharya	'1st Indian Summer School on Design Research – DRM GURUKOOLL',	Design Innovation Centres, IISC and IITG	01-08 <sup>th</sup> July 2023	National	50
07	Dr. Sheetal M. Gokhale, Dr. Pankaj Upadhyay	Game Design for Education, Kanimuni	Design Innovation Centre (DIC)	8-17 <sup>th</sup> December 2024	National	20

08	Dr Supradip Das	Kuhila Innovative Toy Exploration” (KITE)	Design Innovation Centre (DIC)	30 <sup>th</sup> Oct -3 <sup>rd</sup> Nov 2023.	National	30
09	Dr Pratul Ch Kalita	A 3-day Executive Development Programme on Design Thinking for Competitive Advantage	DoD	5-7 <sup>th</sup> March 2024	National	39

## STUDENTS’ ACHIEVEMENTS

- Mr. Gurdeep Singh: Alexander C. Williams, Jr., Design Award 2023; Human Factors and Ergonomics Society (HFES), Washington D.C., U.S.
- Mr. Gurdeep Singh: Innovation Award 2023 (Runner-up); PREMUS, WDPI, and MYOPAIN 2023 International Scientific Conference, Bengaluru, India.
- Mr. Gurdeep Singh: The Institution of Engineers – India (IEI) – NMLC – FCRIT Research Excellence Award (RE National, PhD) 2023; IEI-NMLC and FCRIT, Mumbai, India.
- Mr. Gurdeep Singh: The Dieter W. Jahns Award 2023; The Foundation for Professional Ergonomics, Bellingham, Washington, U.S.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Or g PhD degree received from	Designation	Areas of Interest
01	Shakuntala Acharya	Indian Institute of Science (IISc), BANGALORE	Assistant Professor Grade 1	Design Creativity and Innovation; Design for Sustainability; Smart Cities; Design methodology
02	Sharmistha Banerjee	IIT Guwahati	Assistant Professor	Design for sustainability, Agricultural Product Design, Life cycle Assessment and Design, Sustainable Product-Service System Design, Product design, Medical Product Design, User Experience Design, Human Centered Design
03	Utpal Barua	IIT Guwahati	Professor	Graphic Design, Design drawing and Visualization, Visual design Principles and applications, Indian Symbology
04	Amarendra Kumar Das	IIT Guwahati	Professor	Industrial Design, Rapid Prototyping and tooling, space Design, Environment Graphics, Design for Disabled
05	Supradip Das	IIT Guwahati	Assistant Professor	Origami Inspired Product Development, Toy for tomorrow, Paper Craft, Transformable furniture, Structural packaging design.



06	Debayan Dhar	IIT Guwahati	Associate Professor	Usability Engineering, Human-Computer Interaction, Design Ethics, Biomedical Device Design
07	Santosh Jagtap	University of Cambridge, UK	Associate Professor	Co-design and co-creation, Design creativity and Innovation management, Design for low-income and marginalized people, Design for sustainability, Design and culture, Human centered design of emerging-technology-based products, Design theory and methodology
08	D.Udaya Kumar	IIT Guwahati	Professor	Topography, Type Design, Information Graphics, Motion Graphics, design Research, Exhibition Design, architecture
09	Sheetal M.Gokhale	IIT Guwahati	Assistant Professor	Film & Video, Animation Graphic Design
10	Shareka Iqbal	--	Assistant Professor	Adaptive Re sue ,Solar Passive Architecture
11	Pratul Chandra Kalita	IIT Guwahati	Professor	Design Management, Design Method, Design for Development
12	Sougata Karmakar	Bharathiar University, Coimbatore	Professor	Virtual Simulation (CAD and Digital Human Modeling), Physical Ergonomics (Product and Workstation design), Cognitive Ergonomics (Information processing), and Occupational Safety & Health
13	Ajeet Kumar	National Taiwan University of Science and Technology	Assistant Professor	Additive Manufacturing, Lattice Structure, Biomimetic Design, Direct Digital Manufacturing, Design for Additive Manufacturing
14	Mriganka Madhukailya	IIT Guwahati	Assistant Professor	Short Film, New Media theory, Video Art, Documentary Film, Participatory Theory
15	Manoj Majhi	IIT Guwahati	Associate Professor	Animation, Special Effects, Cartooning
16	Urmi Ravindra Salve	University of Calcutta	Associate Professor	Human factor engineering, Occupational Ergonomics, Research Methodology
17	Abhishek Srivastava	IIT Bombay	Assistant Professor	Interaction Design, Design for Development, New Media, Graphic Design & Cartooning.
18	Abhishek Singh	IIT Guwahati	Assistant Professor	Automotive design, Product Design, Graphic Design, Design Research.

19	Keyur Sorathia	IIT Guwahati	Associate Professor	Interaction Design, Gesture controlled User Interfaces, Design for development.
20	Pankaj Upadhyay	IIT Guwahati	Assistant Professor	Product design, Industrial Design, Design for Manufacture, Consumer product Design, Industrial Equipment design.
21	Prabin Kumar Bora	Indian Institute of Science (IISc) Bangalore	Visiting Professor (on Contract )	Image Processing and Computer Vision
22	Ravi Mokashi Punekar	IIT Guwahati	Visiting Professor (on Contract )	Design Research, Design thinking, Product Design

# Electronic and Electrical Engineering

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 1995**

**ACADEMIC PROGRAMMES OFFERED:**

**BTech Programmes:**

- (i) Electronics and Communication Engineering
- (ii) Electronics and Electrical Engineering (started in July 2008)

**MTech Programmes:** The Department offers MTech programme in Electronics and Electrical Engineering with the following specializations.

- (i) Communication Engineering
- (ii) Power Engineering
- (iii) Microelectronics, Photonics & RF Engineering
- (iv) Signal Processing & Machine Learning
- (v) VLSI and Nanoelectronics
- (vi) Systems, Control and Automation

**MS(R) in E-Mobility:** The Master of Science by Research programme in E-Mobility is jointly administered by EEE and ME departments. Total intake is 20 that includes 10 seats for industry sponsored candidates and remaining 10 seats are for regular candidates. Out of 10 seats, 5 seats are for EEE and 5 seats for ME. The regular candidates will be selected based on GATE score.

**Interdisciplinary MTech Programme:** The interdisciplinary master's degree programme in Data Science with intake of 20 started in July 2019. This programme is jointly administered by CSE, EEE and Math departments on yearly-rotation basis.

**Dual Degree Programme [MS (Engg) + PhD]:** Dual Degree Master of Science (Engineering) + PhD programme started in July 2015 with sanction intake of 19. The major areas of research are the same as those under the PhD Programme.

**PhD Programme:** The PhD programme covers the following major areas of research.

**Communication Engineering:** Wireless communications, information theory and coding, communication networks, computer networks, computational photography, data compression, and cryptography, quantum error correction, quantum computation and communication, waveform design for wireless communications, vehicular communications, 5G/6G wireless communication, AI/ML application in communications, adversarial machine learning.

**Power Engineering:** Power systems, power electronics, power quality, power electronics application in power system, micro grid and renewable energy resources, power distribution system planning, custom power devices, electrical machines, control of electrical drives, smart grids and electric vehicles, high voltage engineering, high voltage engineering and applied electromagnetics, condition monitoring of power apparatuses, high voltage and pulse power, high power density motor design, inductive charging for EVs, vector control of motors, power system monitoring and control, power system cyber-security, decentralized control for the smart grid.

**Microelectronics, Photonics and RF Engineering:** Antenna, microwave engineering, electromagnetics, computational electromagnetics. fiber optic communication, optoelectronics, photonics integrated circuits, optical communication, optical networks, optical sensors, microwave and photonics, optical instrumentation, plasmonics and metamaterials and smart electro-tunable plasmonic metasystems, silicon photonics, structural health monitoring using fiber optics, distributed acoustic sensors, optical signal processing, digital holography, phase imaging, photonics and metamaterial device design using AI, reconfigurable metasurfaces, terahertz photonic topological insulators, metamaterials and metasurfaces for advanced photovoltaics and light emitting diodes, antenna, microwave engineering, electromagnetics, computational electromagnetics, vacuum electronics, millimeter-wave communication.

Signal Processing and Machine Learning: Data sciences, biomedical signal and medical image processing, speech and handwriting processing, image/video processing and computer vision, pattern recognition, multimedia analytics, biometrics, counter-spoofing, security and privacy, biometrics and biometric counter-spoofing, privacy preserving analysis for secure computation, secure key distribution and management in wireless sensor networks, video analytics, vision and language, natural language processing, deep learning.

Systems, Control and Automation: Systems theory, control theory and applications, control of nonlinear uncertain systems, artificial intelligence based control, identification and control of nonlinear systems, relay based identification and autotuning, adaptive control, optimal control, robotics and automation, cryptography, robust control, cooperative control of multi-agent systems, decentralized control for smart power grid applications, model predictive control, reinforcement learning, vibration control of flexible structures, modelling and control of mechatronic and robotic systems, multi-agent systems and cooperative control, group-coordinated control of UAVs, UGVs and AUVs, connected vehicle platooning, passivity-based control and dissipativity, negative-imaginary systems theory, robust control of missiles, spacecraft and rockets, smart and microgrid control using a multi-agent framework, controller design for energy management system in electric vehicles.

VLSI and Nanoelectronics: Solid-state devices, analog and RF integrated circuits, digital systems, DSP architectures, CAD for VLSI, high performance computing, organic electronics, flexible electronics, instrumentation, MEMS, SAW devices, quantum computing, hardware security, sensors, non-volatile memory technologies, spintronics, power semiconductor devices, photodetectors, VLSI system design, embedded system design, computer architecture, neuromorphic computing, in-memory computing, hardware realization of machine learning algorithms, magnetic random-access memory (MRAM), magnetic tunnel junctions (MTJ), advanced data storage technologies, neuromorphic devices, wearable sensors, electronic nose, papertronic sensing systems, and sensor interface electronics, quantum photonics, wide bandgap semiconductors, reliability, photovoltaics, energy devices for green hydrogen, quantum sensing devices, semiconductor packaging technologies, low-dimensional semiconductor devices, single electron transistors, single photon emitters and detectors, nano-bioelectronics, light emitting diodes and transistors, transient electronics.

### **PhD Programme under Interdisciplinary Category:**

Interdisciplinary PhD has been introduced with other departments of IIT Guwahati from July 2020.

## **LABORATORY FACILITIES**

The Department of EEE has 33 laboratories which are equipped with the state-of-the-art equipment and software. These laboratories are used for instructional purposes as well as carrying out R&D activities in diverse areas. The list of laboratories presently functioning in the Department is as follows.

### **Name of Labs and Brief Description**

#### **1. Advance Photonics Simulation Laboratory (Instructional)**

The Advance Photonics Simulation Laboratory is well-equipped with several experimental setups and several software packages for experiments. The facilities include loss measurement, LED characterization etc. The major software available in this laboratory are: OptiSystem, OptiSPICE, OptiGrating, OptiFDTD, OptiFiber, Silvaco TCAD 3D.

#### **2. Undergraduate Project Lab**

The lab started functioning in August 2016. This lab is specially designated for BTech students to perform experiments related to their bachelor's projects.

#### **3. Communication and Networking Lab (R&D)/ Advance Photonics Laboratory**

The lab has a dark room for characterization and experimental facilities for optoelectronics and photonics systems and devices.

#### **4. Communication Lab-I (R&D)**

#### **5. Communication Lab-II (R&D)**

#### **6. Communication Lab-III (R&D)**

Research Scholars working in different areas related to communication engineering use these labs.

#### **7. Control & Instrumentation Lab-I (R&D)**

The Control and Instrumentation Laboratory-I focuses on the research and development activities related to control theory and applications, stochastic systems, robotics, ultrasonic instrumentation, underwater acoustics etc. Some of the current areas of interest include robust and adaptive control theory, relay control theory and applications, mobile robotics and multi-agent systems, MEMS and SAW devices, fractional order systems discrete event systems. Laboratory infrastructure includes personal computers for research scholars and several experimental set-ups, namely, mobile robot platforms, multi DOF manipulator, twin rotor MIMO system, inverted pendulum systems, level control system.

#### **8. Control & Instrumentation Lab-II (Instructional)**

The Control and Instrumentation Lab-II is an instructional laboratory used for lab courses such as Instrumentation Lab (UG), Robotics & Control Lab (UG), and Applied Control Lab (PG). The laboratory has work benches each equipped with advanced test and measuring instruments like 200 MHz DSO, DDS function/arbitrary waveform generator, 6½ digit DMM, multioutput DC power supply, and PC. The lab is equipped with large number of transducers for measurement of physical quantities like temperature, displacement, level, force and strain, in addition to PLC, process calibrator, hot chamber, coupled tank system, motor speed control system and other facilities for instructional laboratory. The students' instruction is focused to learn the design and implementation of measurement and control systems, e.g. signal conditioning circuits, controllers like PID, and robots.

#### **9. Electrical Machine Lab (Instructional)**

The Electrical Machine Lab is equipped with all kinds of AC and DC motors and generators required for undergraduate lab sessions and research activities in the field. For better understanding of control of various motors, the lab also has braking and drive modules.

#### **10. Electro-Medical & Speech Lab (R&D)**

The Lab was set up in the year 2004. The laboratory focuses on the research and development activities related to biomedical signal and image processing, speech signal processing, coding technology areas. Some of the current topics of interest include speech enhancement, speaker recognition, children speech recognition, speech synthesis, stressed speech processing, fundus image processing, ECG signal processing, biometrics and handwriting data processing.

#### **11. Electronic Circuit Lab-I (Instructional)**

#### **12. Electronic Circuit Lab-II (Instructional)**

The Electronic Circuits Lab-I & II mainly hold basic electronics lab sessions for the first-year undergraduate students of all the departments. The labs are equipped with a large number of set-ups each containing cathode ray oscilloscope, function generator, digital multimeter, and multioutput DC power supply. The labs are well-stocked with electronic components like resistors, capacitors, diodes, transistors, analog and digital ICs. Experiments performed in the lab cover

hardware design and implementation of basic circuits which include filters, rectifiers, transistor characteristics, comparators, combinational logic circuits, synchronous and asynchronous counters, latches, and opamp circuits.

### **13. Embedded System Lab (Instructional)**

Microprocessors and Embedded System Laboratory provides students with hands-on experience with building, programming, testing, and debugging processor-based systems. For example, systems that students build may incorporate audio and various tactical input devices. It is an instructional laboratory. The Lab holds laboratory courses like Digital Signal Processing Lab, Digital Circuits and Microprocessors Lab, and Embedded Systems Lab.

**14. E-Mobility Lab (EML):** This is a new initiative for developing state-of-the-art technologies for electric vehicles (EVs). The major research interests of this lab include electric motor design, power electronics converters of EVs, inductive charging systems, grid to vehicle interaction (G2V), and vehicle powertrain control algorithms.

### **15. High Frequency & Communication Lab (Instructional)**

High Frequency & Communication Lab is an instructional laboratory and holds Lab courses like Microwave Engineering Lab, Communication Design Lab, etc. In addition, research works are carried out in the areas of antennas, analog & digital communication systems and microwave engineering.

### **16. HPC and FPGA Design Lab (R&D)**

High Performance Computing and FPGA Lab (HPC and FPGA Lab) was established in 2012 at the Department of EEE with initial support from IIT Guwahati and *Nvidia Corp*. The work at HPC and FPGA Lab is focused towards exploring possibilities of high-performance computing and FPGA based system design in various fields related to electrical engineering and scientific computing in non-electrical engineering disciplines.

Our group's mission is as follows: To carry out multidisciplinary research in reconfigurable, parallel and distributed computing as a basis for long-term partnership and collaboration amongst industry, academia, and government; focus on research in advanced computer architectures, algorithms, networks and systems, both theoretical and applied; to carry out state-of-the-art research and development with collaborators with maximized synergy and pooled, leveraged resources. Being an educational institute, to enrich the education of high-quality students, has been the priority. In turn, the focus is to contribute knowledge and technologies in this field.

### **17. Image Processing and Computer Vision Lab (R&D)**

The ongoing major activities in the Image Processing and Computer Vision (IPCV) Lab include music signal processing, histopathology image processing, denoising, video processing, image super resolution, image forensic, computer vision, image hashing, gesture recognition and human-computer interaction.

### **18. Post Graduate Project Lab**

The lab has started functioning from August 2016. This lab is specially designated for MTech students to pursue the work related to their master's projects.

### **19. Multimedia Analytics Lab (R&D)**

The Multimedia Analytics Lab was set up in July 2013. This lab focuses on research and development activities related to analysis and analytics generation from multi-modal (video, speech and text) data. The research work focuses on applications related to deep learning, broadcast analytics, surveillance video analytics, language and vision, deep fake synthesis and handwriting recognition.

### **20. Power & Control Lab-I (R&D)**

### **21. Power & Control Lab-II (R&D)**

Research and development activities related to power & control areas are conducted in this lab. Research Scholars, MTech/BTech students and Project Engineers working in these areas use this laboratory.

**22. Smart Energy Conversion Laboratory:** The major research interests of this lab include AC and DC distribution grid, microgrid, power quality improvement, HVDC and FACTS, electric vehicles, etc. The research lab has prototype of various power electronics devices like bi-directional dc-dc converter, three phase grid connected inverters, distribution static compensator (DSTATCOM), dynamic voltage restorer (DVR), unified power quality conditioner (UPQC), dual active bridge (DAB) converter, smart transformer, battery charger, etc. Controllers like dSPACE MicroLabBox and eZDSP28335 are being used to control the various converters.

### **23. Power Electronics Lab (Instructional)**

The lab has started functioning from August 2015. It contains the major facilities required to perform undergraduate and postgraduate experiments related to power electronics. In addition, design of power electronic hardware, prototype development and testing can be performed in the lab. DSP and FPGA controllers for power electronics applications also can be tested.

### **24. Power Systems Lab (Instructional)**

The Power Systems Lab is well-equipped with several experimental set-ups and software packages for real time experiments. The facilities include overcurrent, under voltage and differential relays. The major equipment in the Power Systems Laboratory are as follows. Relay Demonstration Set-up: IDMT over current relay, instantaneous over current relay, IDMT under voltage relay, current transformer, negative sequence relay, differential relay, high voltage AC/DC/Impulse set-up. List of Software: PSS/E, PSCAD, and DIgSILENT.

### **25. Signal Informatics Lab (R&D)**

Research and development activities related to security and document processing areas are conducted here. The Research Scholars and Project Engineers working in these areas use this laboratory. A separate cubicle has been created for housing an EEG signal recording facility.

### **26. Signal Processing Lab (R&D)**

The Signal Processing Lab has started functioning from 2016. The lab carries out research and development activities related to speech processing, image processing, biometric face recognition, music signal processing, machine learning and cleft monitoring system. The Research Scholars working in these areas use this laboratory.

### **27. System Simulation Lab (Instructional)**

The System Simulation Lab is a fully computerized laboratory equipped with highly configured PCs and various computational and simulation software like MATLAB, Borland C++, FPGA Advantage from Mentor Graphics, Xilinx ISE Design Suite, Zeland IE3D EM simulation software,



Altera Quartus webpack, Electronics Workbench, MicroSim DesignLab (EDA software), CADSTAR PCB Design, Elanix SystemView, HP-EEsof, Hypersignal, and Operating Systems such as HP Unix, Sun Solaris, Red Hat Enterprise Linux, and Microsoft Windows.

### **28. VLSI Lab-I (R&D)**

### **29. VLSI Lab-II (R&D)**

VLSI Lab was set up in the year 2004 as an integral part of the Department of EEE, followed by commencement of MTech and PhD programmes in the field of VLSI design. Since its inscription, the VLSI lab has constantly been upgraded to match with the technologies of the modern era. The VLSI library integrated with the lab helps the students, researchers and all enthusiasts to acquire all the much-needed concepts to deal with different practical experiments. The focus of this lab is widely spread towards different pros and cons of the entire upgrading VLSI domain. Development works at different levels like semiconductor device simulation, circuits & systems design and research in recent trends like biomedical signal acquisition and processing have extensively been carried out.

### **30. VLSI-ADSP & Communication Lab (R&D)**

The Department has set up a sophisticated DSP & Communication Lab with the state-of-the-art equipment from *Analog Devices* and *Texas Instruments*, and Real Time DSP Software from *Hyperception Inc.* The Department has also received a donation consisting of hardware kits and Visual DSP software from *Analog Devices*.

### **31. Anechoic Chamber**

For the measurement of antenna pattern, EMI-EMC, and radar cross-section, a state-of-the-art Anechoic chamber is developed under the IMRPINT-I scheme of MHRD and DST under the grant number of 7802. Major equipment in the lab includes VNA Anritsu (8 kHz – 20 GHz), RF signal generator (Rohde & Schwarz), microwave source (2 kW), RF-sensor, and automatic positioning system.

### **32. Silicon Photonics and Microelectronics Lab (R&D)**

For the fabrication of silicon photonics and microelectronic devices, the lab is equipped with class 1000 clean room, photolithography room, class 100 work benches— organic and inorganic, E-beam evaporator of 4 kW, mask aligner MJB4 with 800 nm critical dimensions, etc.

### **33. Microelectronics Laboratory (Instructional)**

This laboratory is providing hands on experience in VLSI design to the BTech (ECE) students.

## **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

<b>Sl. No.</b>	<b>Equipment and Facilities</b>	<b>Qty</b>	<b>Amount in Lakhs</b>
1	LCR Meter	01 no.	4.11
2	Desktop PC: HP Elite Tower 600 G9	35 nos.	29.94
3	Keithley Make Interactive Digital Source Meter	01 no.	6.47

## **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Image processing, computer vision, speech processing, biomedical signal and image processing, multimedia signal processing; microwave, antenna design, wireless communication, error control coding; analog and digital circuits

design, MEMS, VLSI CAD, photonics, semiconductor devices, solid-state sensors, instrumentation, interfacing circuits; electrical converters, electric drives, smart grids, wind energy, solar energy, solar photovoltaic, power electronics and power systems; electrical machine design, contactless charging system for EVS, high voltage engineering and liquid dielectrics, battery management system for EVS; control systems, stochastic systems, relay based identification and auto-tuning, control systems, control theory applications; pattern recognition, machine learning, multimedia analytics; silicon photonics, microwave wireless power transfer, metamaterials, optoelectronics devices, distributed optical fiber sensors for structural health monitoring; biometrics and biometric counter-spoofing; cryptography and privacy preserving analysis; image forensics and analytics, depth map generation from single still images; deep learning, broadcast analytics, surveillance video analytics, language and vision, deep fake synthesis.

#### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
1	Dr. Parijat Bhowmick	IEEE European Control Conference (ECC'23)	Bucharest, Romania	13–16/06/2023	International
2	Dr. Sonali Chouhan	IEEE Guwahati Subsection Conference (GCON2023)	IIT Guwahati	23–25/06/2023	International
3	Dr. Chayan Bhawal	IEEE Guwahati Subsection Conference (GCON2023)	IIT Guwahati	23–25/06/2023	International
4	Dr. Debabrata Sikdar	IEEE Guwahati Subsection Conference (GCON2023).	IIT Guwahati	23–25/06/2023	International
5	Dr. Smarajit Das	ISIT 23	TAIPEI	28/06/2023	International
6	Dr. Ravindra K. Jha	Low-Energy Digital Devices and Computing (ICLED-2023)	National University of Singapore (NUS), Singapore	29/06/2023–01/07/2023	International
7	Dr. Manish Bhatt	Photonics 2023	IISc Bangalore	05/07/2023	National
8	Dr. Ravindra K. Jha	IEEE Photonics Conference (IPC 2023).	IISc Bangalore	05–08/07/2023	National
9	Dr. Debabrata Sikdar	IEEE Photonics Conference (IPC 2023).	IISc Bangalore	05–08/07/2023	National
10	Dr. Manish Bhatt	IEEE International Conference on Transdisciplinary AI	Laguna Hills, CA, USA	25/09/2023	International
11	Dr. Prithwijit Guha	8th International Conference on Computer Vision and Image Processing (CVIP 2023)	IIT Jammu	03/11/2023	International
12	Dr. Prithwijit Guha	10th International Conference on Pattern Recognition and Machine Intelligence (PReMI 2023)	ISI Kolkata	12–15/12/2023	International
13	Dr. Anirban Dasgupta	2023 IEEE Guwahati Subsection Conference (GCON2023)	IIT Guwahati	23–25/06/2023	International
14	Dr. Anirban Dasgupta	10th International Conference on Pattern Recognition and Machine Intelligence (PReMI'23)	Kolkata	12–15/12/2023	International
15	Dr. Parijat Bhowmick	IEEE Conference on Decision and Control (CDC'23)	Marina Bay Sands, Singapore	13–15/12/2023	International

16	Dr. Prithwjit Guha	The 14th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2023)	IIT Ropar	15–17/12/2023	National
17	Dr. Sonali Chouhan	IEEE International Conference on Advanced Networks and Telecommunications Systems	Jaipur	17–20/12/2023	International
18	Dr. Sanjib Ganguly	IEEE 3rd International Conference on Control, Instrumentation, Energy & Communication (CIEC)	Kolkata	26/01/2024	International
19	Dr. Sonali Chouhan	The Asia Joint Conference on Computing (AJCC)	Maharakham, Thailand	21–23/02/24	International
20	Dr. Ankush Bag	Indian Semiconductor and Packaging Ecosystem Conference	Chandigarh	29/02/2024–02/03/2024	National
21	Dr. Sonali Chouhan	International Conference on River Corridor Research and Management	Guwahati	07–09/03/2024	International
22	Dr. Manish Bhatt	IEEE South Asian Ultrasound Symposium	IIT Gandhinagar	27/03/2024	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Dr. Parijat Bhowmick	Consensus-based Cooperative Control of AC Microgrids	IIT Guwahati	Guwahati	April 2023
2	Prof. Roy Paily Palathinkal	Selective adhesion on FET for Biosensing Applications	Professor R M Sethunayanan Endowment Lecture, Annamalai University	Chidambaram	13/04/2023
3	Dr. Ravindra K. Jha	Beyond CMOS Fabrication Techniques for Realizing Nano Sensors Devices	School of Electronics Engineering (SENSE), VIT-Chennai	VIT-Chennai	15–19/04/2023
4	Dr. Ravindra K. Jha	Electron Beam Lithography	Centre for Nanotechnology, IIT Guwahati	IIT Guwahati	25–27/04/2023
5	Dr. Sanjib Ganguly	Green and Sustainable Energy: Generation and Management	NIT Kurukshetra	NIT Kurukshetra (online)	15/05/2023
6	Dr. Anirban Dasgupta	A Beginner's Approach to Unsupervised Learning	Nirma University	Ahmedabad	05/06/2023
7	Dr. Parijat Bhowmick	Secondary Voltage and Frequency Control of Inverter-based AC Smart/Micro-grids using a Multi-agent Framework	NIT Rourkela	Rourkela	June 2023

8	Dr. Prithwjit Guha	Artificial Neural Networks, Decision Trees and Random Forests	Summer School on Machine Learning & Deep Learning Techniques, TIH, IIT Guwahati	Guwahati	26/06/2023 – 07/07/2023
9	Dr. Ravindra K. Jha	Advanced Materials for Selective Gas Sensors	National University of Singapore (NUS), Singapore	Singapore	29/06– 01/07/2023
10	Prof. Roy Paily Palathinkal	Sensitive Detection of Biological Matter using FET	10th International Conference on Microelectronics Circuits and Systems, Micro2023	Guwahati	01/07/2023
11	Dr. Debabrata Sikdar	Towards Electro-tunable Nanophotonic Smart Windows	Centre for Nano and Soft Matter Science (CeNS), Bangalore	Bangalore	04/07/2023
12	Prof. Prabir Barooah	Coordination of consumer demand to provide battery-like service to the power grid	IIT Delhi	IIT Delhi	14/07/2023
13	Dr. Ravindra K. Jha	Next Generation Resistive Sensors	Department of Electronics and Communication Engineering, NIT Calicut	NIT Calicut	24– 28/07/2023
14	Dr. Prithwjit Guha	Applications of AI	EICT Academy, IIT Guwahati	Guwahati	07/08/2023
15	Dr. Anirban Dasgupta	Scientific Writing using LaTeX	SAB, IIT Guwahati	Guwahati	09– 10/09/2023
16	Dr. Chayan Bhawal	Higher studies and Research Opportunities after B.Tech	Assam Engineering College, Jalukbari	Guwahati	11/10/2023
17	Dr. Chayan Bhawal	Higher studies and Research Opportunities after B.Tech	Gauhati University	Guwahati	12/10/2023
18	Dr. Praveen Tripathy	Basics of Power Electronics and Inverter-based Generation Sources	NERLDC, GRID-INDIA, Guwahati	Guwahati	10/11/2023
19	Dr. Sanjib Ganguly	Resource Adequacy And Energy Storage Systems	North Eastern Regional Load Despatch Centre (Grid Controller of India Ltd.)	Guwahati	20/11/2023
20	Prof. Prabir Barooah	Demand response as a way to provide virtual energy storage	GRID-India (as part of Grid-India's training workshop)	NERLDC, Guwahati	21/11/2023
21	Dr. Ravindra K. Jha	Next Generation Resistive Gas Sensors: Status & Scope	IEEE Patna Students Chapter & EE Department, IIT Patna	IIT Patna	24/11/2023
22	Dr. Ravindra K. Jha	Sustainable Approach toward Developing Next-Generation Gas Sensors	Centre for Nanotechnology, IIT Guwahati	IIT Guwahati	29/11/2023 – 01/12/2023.
23	Prof. Rohit Sinha	Machine Learning for Speech Processing: A Deep Learning Perspective	International Conference on Oriental-COCOSDA 2023	Indira Gandhi Delhi Technical University for Women	05/12/2023

				(IGDTUW), Delhi	
24	Dr. Ankush Bag	Engineering for Gallium Oxide (Ga <sub>2</sub> O <sub>3</sub> ) based Deep UV Optical Sensors	IEEE Sensors Winter School (IEEE IWS)	IIT Guwahati	05– 06/12/2023
25	Prof. Harshal B. Nemade	Measurement Basics and Electrical Characterization	Familiarization Workshop on Quantum Materials and Nano Devices, INUP-i2i 2023	IIT Guwahati	08/12/2023
26	Dr. Tanmay Dutta	Spin to Spintronics	Birla Institute of Technology, Patna	Patna	
27	Dr. Tanmay Dutta	World of Spin and Memory Devices	Indian Nanoelectronics User's Programme (INUP) 2023, IIT Guwahati	Guwahati	08/12/2023
28	Dr. Tanmay Dutta	Spintronic and Quantum Devices	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati	10/12/2023
29	Dr. Tanmay Dutta	Device Characterization and Testing	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati	12/12/2023
30	Dr. Tanmay Dutta	Challenges and Future Directions of Electronic Devices Considering Ethical and Environmental Aspects	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati	12/12/2023
31	Dr. Ravindra K. Jha	Transient Sensors: An Introduction	The Next Generation Electronics Summit NEleX	Vellore Institute of Technology, Vellore	14– 16/12/2023
32	Dr. Ravindra K. Jha	Design & Fabrication of Transient Sensors	Amrita Vishwa Vidyapeetham, Chennai Campus	Chennai	16/12/2023
33	Prof. Roy Paily Palathinkal	Magnetic and Semiconductor Devices for the Analysis of Breath Gas Components	The XXII International Workshop on the Physics of Semiconductor Devices (IWPSD 2023)	IIT Madras	16/12/2023
34	Dr. Ashwini Sawant	IEEE Webinar on "Orbital Angular Momentum Beams in Wireless Communication Technology"	KL University, Hyderabad	Online	18/12/2023
35	Dr. Rishikesh Dilip Kulkarni	Digital Holographic Techniques for Under Water Imaging	High-end Workshop on Next Generation Medical Devices: (Series-2, 2023), NIT Rourkela	Online	30/12/2023
36	Dr. Manoj B. R.	Activity Sensing using Wireless Signals	IIT BHU	Varanasi	10/01/2024
37	Dr. Manoj B. R.	Neural Networks	IIT BHU	Varanasi	11/01/2024
38	Dr. Praveen Tripathy	Introduction to the Monitoring of the Distribution System	Asian institute of Technology, Bangkok, Thailand	Bangkok	15/01/2024
39	Dr. Ravindra K. Jha	Introduction to Transient Sensors	MANIT Bhopal, Madhya Pradesh	Bhopal	06/02/2024

40	Dr. Sanjib Ganguly	Reactive Power Resources	North Eastern Regional Load Despatch Centre (Grid Controller of India Ltd.)	Guwahati	08/02/2024
41	Prof. Roy Paily Palathinkal	Sensors for the Detection of Breath Components	International Conference on Devices, Sensors and Systems (CoDSS), ECE Department	Tezpur University	11/02/2024
42	Dr. Manoj B. R.	Wireless Sensing Using Massive MIMO Array	5G Use Case Labs: Awareness and Pre-commissioning Readiness, IIT Guwahati	Guwahati	13/02/2024
43	Prof. Roy Paily Palathinkal	Devices for the Detection of Breath Components	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	IIT Guwahati	14/02/2024
44	Dr. Ravindra K. Jha	Design & Development of Transient Sensors	Centre for Nanotechnology, IIT Guwahati	IIT Guwahati	14–16/02/2024
45	Dr. Ankush Bag	Device Engineering for Deep-UV Photodetectors using Gallium Oxide	INUP-i2i 2024 Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	IIT Guwahati	14–16/02/2024
46	Dr. Prithwijit Guha	Lightweight Networks for Computer Vision Systems	Indo-German Bi-lateral Workshop (More than Moore Integration of Sensing and Artificial Intelligence on a Chip), IIT Bhilai	Bhilai	16/02/2024
47	Dr. Ankush Bag	Ga <sub>2</sub> O <sub>3</sub> for Next-Generation Power Devices	SERB Workshop on “Wide and Ultrawide Bandgap Semiconductor Devices and Applications	CSIR-CEERI, Pilani	17/02/2024
48	Dr. Rishikesh Dilip Kulkarni	Speckle Metrology	Workshop on Speckle Metrology, International School of Photonics, Cochin University of Science and Technology	Online	23/02/2024
49	Dr. Prithwijit Guha	Lightweight Networks for Face Analytics	IEEE Mathworks Joint Workshop	Guwahati	28/02/2024
50	Dr. Prithwijit Guha	Interacting with Scenes: A Joint Vision-Language Task	Recent Trends of Research in Computer Vision, CIT Kokrajhar	Kokrajhar	11/03/2024
51	Dr. Ankush Bag	Utility of Semiconductors: Communicating Science for Common People	Indira Gandhi National Open University (IGNOU)	Online	13/03/2024
52	Dr. Ankush Bag	Recent Advancements in Wide Bandgap Semiconductor Technologies	Semiconductor In-house Conference, IIT Guwahati	IIT Guwahati	13/03/2024
53	Prof. Roy Paily Palathinkal	Opportunities in the Semiconductor Sector	Online Seminar at, India’s Techade: Chips for Viksit Bharat	NIT Agartala (Online)	13/03/2024

54	Prof. Roy Paily Palathinkal	Developments in Semiconductor Technology and Applications	Semiconductor at IIT Guwahati, India's Techade: Chips for Viksit Bharat	IIT Guwahati	13/03/2024
55	Dr. Prithwjit Guha	Visual Question Answering with Dual Attention and Question Categorization	International Conference on Data Driven AI, Kaziranga University	Jorhat	15/03/2024
56	Dr. Anirban Dasgupta	Workshop on Foundation of Python For Datascience	SAB, IIT Guwahati	Guwahati	16–17/03/2024
57	Prof. Roy Paily Palathinkal	Semiconductor Industry of the Future	Viksit Bharat Western zone workshop - Thriving and Sustainable Economy, Datta Meghe Institute of Higher Education & Research	Nagpur (online)	30/03/2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
1	Prof. Sudeb Dasgupta	IIT Roorkee	Nanosheet/FinFET Transistor Technology for Beyond Moore Applications	22/07/2023	
2	Dr. Veeresh Deshpande	IIT Bombay	CMOS Back-End-of-Line Integration of Ferroelectric Tunnel Junctions for Neuromorphic Computing	01/08/2023	
3	Prof. Bikash Pal	Imperial College, London, UK	Robust Volt-VAR Control in Power Distribution System	19/12/2023	IEEE PES Distinguished Lecture
4	Prof. Niladri Chakraborty	Power Engineering, Jadavpur University	Emulator Based Microgrid Research Directions	24/01/2024	IEEE PES Distinguished Lecture
5	Dr. Shubham Sahay	Indian Institute of Technology Kanpur	Energy-efficient Computing Platforms and Hardware Security Primitives	07/02/2024	Research Collaboration and Lecture
6	Prof. Sivaji Chakravorty	Jadavpur University, Kolkata	Non-Invasive Techniques for Health Monitoring of Oil-Paper Insulation in Transformer	15/03/2024	IEEE PES Distinguished Lecture
7	Dr. Shubhadeep Bhattacharjee	IIT Hyderabad	Ultra-low Power 2D Materials-based Devices for Classical and Neuromorphic Computing	21/03/2024	IEEE Guwahati Sub-Section

**SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED**

<b>Sl. No.</b>	<b>Name of Faculty (Convener/ Co-ordinator, etc.)</b>	<b>Name of Sem./Wor./Con.</b>	<b>Funded By</b>	<b>Date</b>	<b>International/ National</b>	<b>No. of participants</b>
1	Dr. Debabrata Sikdar	COMSOL Workshop	IIT Guwahati	12/04/2023	National	20
2	Dr. Arun Tej Mallajosyula	INUP-i2i Offline Familiarization Workshop on Nanoelectronics: Fabrication and Characterization	MeitY, GoI	25–27/04/2023	National	53
3	Dr. Arun Tej Mallajosyula	INUP-i2i Hands-on Training on Fabrication and Characterization of Nanoelectronic Devices	MeitY, GoI	02–11/06/2023	National	36
4	Dr. Debabrata Sikdar	COMSOL workshop	IIT Guwahati	11/08/2023	National	25
5	Dr. Tanmay Dutta (Convener)	ICANN 2023 - 8th International Conference on Advanced Nanomaterials and Nanotechnology	Multiple	29/11/2023–01/12/2023	International	500
6	Dr. Anirban Dasgupta	Certificate Programme in Machine Learning and Deep Learning	Hosted jointly by IIT Delhi and TimesPro	Nov 2023– Jan 2024 (On weekends)	National	60
7	Dr. Manoj B. R.	Certificate Programme in Machine Learning and Deep Learning	Hosted jointly by IIT Delhi and TimesPro	Nov 2023– Jan 2024 (On weekends)	National	60
8	Dr. Ravindra K. Jha	IEEE Winter School	IEEE sensor council	05–06/12/2023	National	210
9	Dr. Arun Tej Mallajosyula	INUP-i2i Online Familiarization Workshop on Nano and Quantum Materials & Devices: Fabrication and Characterization	MeitY, GoI	06–08/12/2023	National	372
10	Dr. Chayan Bhawal (Hospitality Chair)	11 <sup>th</sup> National Power Electronics Conference	Various sponsors	14–16/12/2023	National	250
11	Dr. Arun Tej Mallajosyula	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	MeitY, GoI	14–16/02/2024	National	514



## AWARDS AND HONOURS

- Dr. Ankush Bag: Best Project Proposal; Indian Semiconductor and Packaging Ecosystem Conference.
- Dr. Chandan Kumar: Chair; IEEE Guwahati Sub-section, 2024.
- Dr. Chandan Kumar: Organizing Chair; 11th National Power Electronics Conference (NPEC 2023) held at IIT Guwahati.
- Dr. Debabrata Sikdar: Session chair; Photonics 2023.
- Prof. R. S. Kshetrimayum: Certificate of Appreciation; Editor of IEEE Communications Letters (2021-2023); IEEE Communications Society.

## STUDENTS' ACHIEVEMENTS

- Mr. Shiv Kumar: Best Paper Award; IEEE Electron Device Technology Manufacturing (EDTM) 2024, Bengaluru.
- Mr. Anand Pandey: Best Poster Award; Meghnad Saha Memorial International Conference, Allahabad University.
- Mr. Atanu Purkayastha: Best Poster Award; IIT Roorkee/Perovskite Society of India/ACS Applied Materials and Interfaces.
- Mr. Himangshu Jyoti Gogoi: Best Poster Award; IIT Roorkee/Perovskite Society of India/ACS Omega.
- Mr. Atanu Purkayastha: Best Paper Award; IIT Bombay/ 9th International Conference on Advances in Energy Research/Springer Nature.
- Mr. Atanu Purkayastha: Mehta Rice Engineering Scholar Programme (MRESP) Fellowship Award.; Rice University, U.S.A..
- Ms. Salam Athoibi Devi: PMRF; MHRD, Govt. of India.
- Mr. Naveen Kumar Meka: Best Paper Award; IIT Roorkee/ IEEE International Conference on Computer Applications in Electrical Engineering-Recent Advances CERA2023.
- Mr. Sanjeev Ranjan: Best paper award; College of Engineering Thiruvananthapuram/ 5th International Conference on Control, Communication and Computing.
- Mr. Tanmay Bhowmik: AWSAR Award 2022; DST, Govt. of India.
- Mr. Tanmay Bhowmik: Best Oral Presentation Award; IISC Bangalore/ Photonics 2023 Conference.
- Mr. Dibaskar Biswas: Prime Minister Research Fellowship (PMRF); Ministry of Education, Govt. of India.
- Mr. Subhankar Das: Prime Minister Research Fellowship (PMRF); Ministry of Education, Govt. of India.
- Dr. Dwijasish Das: Grid India Power System Award (GIPSA) 2024; Grid India.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Or g PhD degree received from	Designation	Areas of Interest
1.	Anirban Dasgupta	IIT Kharagpur	Assistant Professor	Deep learning, federated learning, Internet of Things (IoT) applied to smart cities, smart transportation, smart education, smart healthcare
2.	Ankush Bag	IIT Kharagpur	Assistant Professor	Wide bandgap semiconductors, power semiconductor devices, deep UV photodetector
3.	Arun B Alosious	IIT Madras	Assistant Professor	Quantum computation, quantum error correction, coding theory.

4.	Arun Tej Mallajosyula	IIT Kanpur	Assistant Professor	photovoltaics, neuromorphic computing, organic and flexible electronics, emerging memory devices, ReRAM crossbar memories, green hydrogen generation
5.	Ashwini Sawant	Ulsan National Institute of Science and Technology (UNIST), South Korea	Assistant Professor	Gyrotrons, vacuum electronic devices, orbital angular momentum (OAM) communication, metamaterial structures
6.	Chandan Kumar	IIT Madras	Associate Professor	Smart transformer application in power system, grid connected converters and microgrid, power quality improvement using STATCOM, DVR, UPQC, predictive control of power converters, parallel operation of voltage source converters
7.	Chayan Bhawal	IIT Bombay	Assistant Professor	Optimal control, DAE systems, model order reduction, multi-agent systems, chaos theory, robust control
8.	Chitralkha Mahanta	IIT Delhi	Professor	Control system theory and applications, control of nonlinear uncertain systems, artificial intelligence based control, identification and control of nonlinear systems
9.	Debabrata Sikdar	Monash University, Australia	Assistant Professor	Plasmonics and metamaterials, light-matter interaction in nanoscale, dynamic tuning in plasmonic metamaterials and metadevices, plasmon-assisted optical switching, directional scattering, wideband absorption, ultrasensitive detection, tunable optical devices etc., electrovariable nanoplasmonic devices
10.	Gaurav Trivedi	IIT Bombay	Associate Professor	VLSI, HPC, embedded systems, IoT, computer architecture, electronic system design and manufacturing (ESDM), quantum computing, hardware security
11.	Hanumant Singh Sekhawat	University of Twente, The Netherlands	Assistant Professor	System theory, applied mathematics & signal processing
12.	Harshal B. Nemade	IIT Bombay	Professor	Electronic instrumentation, systems design and integration, analog circuits, electronic product development, EMI/EMC issues, ultrasonic measurement, non-destructive testing, underwater acoustic systems, surface acoustic wave devices, and MEMS
13.	Indrani Kar	IIT Kanpur	Associate Professor	Control theory and applications, soft computing applications, neural network based adaptive control, applications of fuzzy logic and neural networks in nonlinear control, kinematic and dynamic control of robot manipulators
14.	Kalpana Dhaka	IIT Delhi	Associate Professor	Channel modeling and resource allocation for wireless relay systems, cooperative communications, multihop relaying, and multicasting in wireless networks.

15.	Kannan Karthik	University of Toronto	Associate Professor	Image and video forensics, biometric counter-spoofing, privacy preserving computation and analysis, multimedia encryption
16.	Kuntal Deka	IIT Guwahati	Assistant Professor	Communication, error correcting codes and information theory
17.	Mahima Arrawatia	IIT Bombay	Assistant Professor	Energy harvesting, RF circuit design, microstrip antennas
18.	Manas Kamal Bhuyan	IIT Guwahati	Professor	Image and video processing, computer vision, pattern recognition and human computer interactions (HCI)
19.	Manish Bhatt	IISc Bangalore	Assistant Professor	Medical Imaging, Image reconstruction, Inverse Problems
20.	Manoj B. R.	IIT Delhi	Assistant Professor	Wireless communications, deep learning for wireless communications and signal processing, adversarial machine learning, joint sensing and communications, buffer-aided relaying networks, Markov chains and their applications
21.	Parijat Bhowmick	IIT Kharagpur	Assistant Professor	Robust control, negative-imaginary systems, passivity-based control and dissipativity, vibration control of flexible structure systems, cooperative control of multi-agent systems (including multi-robot systems), control of smart/micro-grid systems using cyber-physical systems approach
22.	Prabir Barooah	University of California, Santa Barbara	Professor	Distributed control, optimization and coordination, with applications to power grid operation, green buildings, energy sustainability and energy resiliency
23.	Praveen Kumar	Delft University of Technology, The Netherlands	Professor	Optimisation of electrical motors and drives, algorithm development for multi-objective optimisation and multicriteria decision making in engineering systems, simulation and design of electrical motors and actuators using finite element methods (FEM), analytical modeling of electrical motors for rapid simulation, simulation and analysis of hybrid and electric vehicles
24.	Praveen Tripathy	IIT Kanpur	Associate Professor	Power systems
25.	Prithwijit Guha	IIT Kanpur	Associate Professor	Computer vision, machine learning, deep learning, signal processing
26.	Rajesh Alentallil	IIT Kanpur	Associate Professor	Coding and modulation techniques
27.	Ramesh Kumar Sonkar	IIT Kanpur	Associate Professor	Silicon photonics, integrated photonics, fiber lasers optoelectronics device characterization and fabrication, microelectronics and III-V compound semiconductors, photonics integrated circuits, fiber optics communication, non-invasive measurement of physiological

				parameters of human blood, structural health monitoring, antennas, vacuum electron devices
28.	Ratnajit Bhattacharjee	Jadavpur University	Professor	Electromagnetics, microstrip antennas, microwave engineering, wireless communication
29.	Ravindra K. Jha	IIT Kharagpur	Assistant Professor	Electronic sensor, wireless sensor networks, IoT enabled sensors, AI-ML for sensor data analysis, device modelling, fabrication of the devices, interface circuit design & development, data analysis and interpretation of in-house fabricated sensors
30.	Ravindranath Adda	IIT Kanpur	Assistant Professor	Power electronics, distributed generation and power quality
31.	Rakesh Singh Kshetrimayum	NTU Singapore	Professor	Electromagnetic band gap, filters, metamaterials, computational electromagnetics and periodic structures
32.	Ribhu	IIT Roorkee	Assistant Professor	Signal processing for wireless communication, MIMO systems, adaptive and statistical signal processing
33.	Rishikesh Dilip Kulkarni	Ecole Polytechnique Federale de Lausanne	Assistant Professor	Digital holography, speckle metrology, interferometry, digital signal processing
34.	Rohit Sinha	IIT Kanpur	Professor	Speech and audio processing, speech recognition, signal processing
35.	Roy Paily Palathinkal	IIT Madras	Professor	Devices, VLSI and MEMS
36.	Salil Kashyap	IISc Bangalore	Assistant Professor	Wireless communications and signal processing, massive MIMO (a leading 5G wireless technology), algorithm design for wireless systems and its performance analysis, green communications, cognitive radio
37.	Samarendra Dandapat	IIT Kanpur	Professor	Signal processing, speech processing, biomedical signal & image processing, biomedical instrumentation
38.	Sanjib Ganguly	IIT Kharagpur	Associate Professor	Power distribution system planning and optimization, distributed generation, custom power devices, evolutionary algorithms, multi-objective optimization
39.	Shaik Rafi Ahamed	IIT Kharagpur	Professor	Adaptive signal processing, mobile communications, VLSI signal processing, biomedical signal processing
40.	Shabari Nath	University of Minnesota	Associate Professor	Power electronics, application of power electronics to power systems
41.	Sisir Kumar Nayak	IISc Bangalore	Professor	Nanofluid for transformer, metamaterial enhanced WPT, PV integration with grid
42.	Smarajit Das	IISc Bangalore	Assistant Professor	Information theory, error correcting codes
43.	Somanath Majhi	University of Sussex, Brighton, UK	Professor	Relay based identification and auto tuning, control systems, control theory applications

44.	Sonali Chouhan	IIT Delhi	Associate Professor	Wireless sensor networks, coding theory, wireless communications
45.	Sreenath J G	IIT Kanpur	Assistant Professor	Power system state estimation, cyber-security in power systems, applied signal processing for power system monitoring, synchrophasor technology applications, stability and control of networked microgrids
46.	Srinivasan Krishnaswamy	IIT Bombay	Associate Professor	Control Systems, cryptography
47.	Sudarshan Mukherjee	IIT Delhi	Assistant Professor	Next generation wireless communications, specifically, edge computing, ultra-dense networks, signal processing for large scale antenna systems in doubly spread channels (i.e., cell-free/collocated massive MIMO systems, OTFS modulation etc.) etc.
48.	Suresh Sundaram	IISc Bangalore	Associate Professor	Pattern recognition, image / video processing and computer vision
49.	Tanmay Dutta	National University of Singapore	Assistant Professor	Semiconductor devices, memory technologies, spintronics, magnetism, quantum materials
50.	Tony Jacob	IIT Kanpur	Associate Professor	Statistical signal processing and information theory

## Humanities and Social Sciences

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT:** 1998

**ACADEMIC PROGRAMMES OFFERED:** M.A. in Development Studies, MA in Liberal Arts & Ph.D.

## **LABORATORY FACILITIES**

**Language-Cognition Lab:** The lab is engaged in research in language from a cognitive science perspective. We explore the relationship of human language with cognition, with culture as a possible third angle through studies of language processing in various domains.

**Phonetics and Phonology Lab:** Research on language and speech is an exciting area encompassing research in the fields of language technologies and human-computer interfaces in a way which can be employed to various ends ranging from language learning of intelligent systems to the learning capabilities of humans. To fulfill these ends this lab would like to start a modern academic research lab which is focused on the way speech is produced and comprehended. The lab will be involved with experimental investigations of speech processes and their acquisition. Topics include: articulatory movements, measurements of pressures and airflows in speech production, computer-aided waveform analysis and spectral analysis of speech, perception and discrimination of speech like sounds, speech prosody, models for speech recognition, speech disorders, and language acquisition. This laboratory will also play an important role in recording and archiving the languages of the North-East. Apart from that, the facilities in this laboratory will also promote advanced research on languages of the region.

**Sleep & Cognition Lab:** The Sleep & Cognition is a specialized lab where research work in the area of cognition and sleep is being carried out. The present project is funded by the department of science and technology, GOI. This lab has few specialized equipments such as 40 channel Nihon-Khodon polysomnography system, 32 channel active electrode, EEG/ERP system and DC current brain stimulator for designing experiment.

**Psychology Lab:** Psychology laboratory is also used for conducting experiments in the area of social psychology and organizational psychology on regular basis by faculty and research scholars. Psychology lab has already initiated the process of procuring various instruments, which will be used for conducting lab sessions for under-graduate courses in Psychology.

**Archaeological Sciences Laboratory:** The laboratory is used for facilitating research in the area of Archaeological Sciences. The facilities include soil testing (ph, organic carbon, calcium carbonate), sample processing facilities for SEM-EDX experiments, XRD, FTIR, etc experiments. Polaroid Microscope is available for reading petrographic slides for material analysis of artifacts like pottery, stone tools, sediments etc . Color identification, texture analysis, particle size, particle shape and other optical properties is also done. Titrations setup, GPS, calipers of various sizes are available for students work.

**English Language Training Lab:** This is for the compulsory audit course on English Language training in the Btech programme. The software Wordsworth English Language Lab Software is used for the purpose. Besides courses on ELT are also offered to PG students of the institute using the laboratory facilities.

#### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

<b>SI No.</b>	<b>Item name</b>	<b>Quantity</b>	<b>Price</b>
01	Laptop	3	2,03,146.00
02	SPSS	1	2,59,496.00
03	Video Conferencing System	1	1,49,980.00
04	Smart LED Display	1	49,920.00

#### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

The faculties in the HSS department carry out research in several fields of humanities and social sciences. This includes English and Indian literature, Linguistics, Economics, Psychology, Philosophy, Political Science, Archeology, Sociology and History. Faculties and doctoral students pursuing research within these disciplines have been engaged in teaching and research. Major areas of research include Dalit literature, Marathi literature, North-Eastern Archeology and Heritage Management, Common Wealth Literature, Aesthetics, Cultural Studies, Ecocriticism and Translations, Development Economics, Industrial Economics, Labour Economics, Phenomenology and Cognitive Science, Phenomenology and Religion, Ethical Issues related to Science and Technology, Organizational Behaviour, Human Resource Management, Social/Environmental Psychology, I-O Psychology, Literary and Cultural Theory, Microeconomics, Agricultural Economics, Environmental Economics, Econometrics, Philosophy of Technology, Applied Philosophy, Peace Studies, Critical Thinking, Applied Ethics, Philosophy of Education, Phonological theory with special interest in Optimality Theory, vowel harmony, Experimental approaches to Phonology and its acquisition, Social & Environmental History of Assam, Sociology of Science, Historical Sociology, Cognitive linguistics, Endangered and lesser known languages, Language typology, Sociolinguistics, Sleep and Information Processing, Macroeconomics, Applied Game Theory, Sociology of Gender, Sociology of Law, Sociology of Communication, Socio-economic understanding of climate risk and resilience, Urban Living and Sustainable cities, Development Economics, Informal Sector, Issues in Food Security and Social Security, Economics of Education, Identity issues of ethnic minorities, local governance, development policies, social movements, ethnic violence and conflict prevention, Health and Clinical Psychology, Phonetics, Phonology, Acoustic Phonetics, Tibeto-Burman tones, Psychoacoustics, Perception, Public



Economics, Dynamic Economic Theory, Christianity, conversion, ethnic violence, kinship and family, urban issues, Socio-economic history.

## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

### Graduate Research Meet (27-10-2023 & 28-10-2023)

The department seminar Graduate Research Meet held on the 27th and 28th of October, 2023, brought together a diverse cohort of 44 students across 14 panels and a Round Table discussion to delve into the multifaceted discourse surrounding the theme of "Margins and Peripheries in South Asia." This interdisciplinary gathering facilitated an in-depth exploration of various dimensions, ranging from Perspectives on Displacement, Peripheries, and Resistance to Deconstructing Marginalities and Exploring Labour and Sexuality. With each panel focusing on distinct yet interconnected themes such as Interrogating 'Culture' encompassing Food, Religion, Ethnicity, the seminar fostered a comprehensive understanding of the complex social fabric of South Asia.

The seminar commenced with a captivating Keynote Address titled "Describing India: People's Movements and Knowledge Production" by Prof. Ganesh N Devy, a distinguished Linguist and Cultural Activist. Prof. Devy's insights set the stage for engaging discussions, encouraging participants to critically examine the dynamics of marginalization and the construction of knowledge within the South Asian context. The event culminated with an enriching Endnote Address delivered by Dr. Swargajyoti Gohain of Ashoka University, Sonipat, shedding light on the significance of Ethnography in unraveling the narratives of those residing at the margins of society. Through robust dialogue and scholarly exchange, the seminar served as a catalyst for advancing discourse and fostering inclusive perspectives on the complexities of South Asian social realities.

### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
1	Sambit Mallick	20th ISA World Congress of Sociology	Melbourne Convention and Exhibition Centre	01-07-23	International
2	Ngamjahao Kipgen	XX ISA World Congress of Sociology	International Sociological Association	01-07-23	International
3	Sambit Mallick	20th ISA World Congress of Sociology	Melbourne Convention and Exhibition Centre	01-07-23	International
4	Prabhu Venkataraman	Peace and Reconciliation: Philosophical Reviews	Satyna Nilayam, Loyola College	15-07-23	International
5	Prabhu Venkataraman	Buddhist Philosophy of Mind and Cognitive Science with Human Moral Experience	Acharya Nagarjuna University	15-07-23	International

6	Mrinal Kanti Dutta	PAGE-UNEP-TERI Workshop: Towards Inclusive Green Economies	The Energy Research Institute, Delhi	19-08-23	National
7	Vasundhara Jairath	Critical Agrarian Studies in the 21st Century	Journal of Peasant Studies, College of Humanities and Development Studies-China Agricultural University, CASAS, Transnational Institute	12-10-23	International
8	Prabhu Venkataraman	India as an Ideal Power: Role in G20, UNO and International Order	Alagappa University	15-12-23	National
9	Sambit Mallick	48th ISS All India Sociological Conference	Vellore Institute of Technology, Vellore	30-12-23	National
10	Ngamjahao Kipgen	The 64th Indian Society of Labour Economics Annual Conference	School of Economics, University of Hyderabad, Telengana	19-01-24	National
11	Mithilesh Kumar Jha	Mapping the Global Legacy of the Mahatma: Reflections on Politics, Religion, and Culture	Department of Political Science, ZHDC, University of Delhi	20-01-24	International
12	Liza Das	Comparative Reflections on Gender and Higher Education in India	National Institute of Educational Planning and Administration (NEIPA), and Indian Institute of Technology Guwahati	06-03-24	International
13	Abhishek Kashyap	Lisbon International Conference on Philosophy of Science	Centre for Philosophy of Sciences of the University of Lisbon	22-03-24	International

14	Abhishek Kashyap	Philosophical Methodology from Indian and Western Perspectives (ICPR seminar)	Gauhati University	22-03-24	National
15	Abhishek Kashyap	Lisbon International Conference on Philosophy of Science	Centre for Philosophy of Sciences of the University of Lisbon	31-03-24	National
16	Amarjyoti Mahanta	19th Annual Conference North East Economic Association	North East Economic Association and NEHU	20-08-24	National
17	Liza Das	Problems and Responsibilities of Women	Women's Studies Research Centre, Gauhati University	12-03-24	National
18	Rajshree Bedamatta	64 <sup>th</sup> Annual Conference of the Indian Society of Labour Economics	Institute for Human Development & University of Hyderabad	29 <sup>th</sup> to 31 <sup>st</sup> March 2024	National
19	Rajshree Bedamatta	From Research to Impact: Towards Gender Equality in Food Systems (CGIAR Gender Impact Conference)	Indian Council of Agricultural Research, NASC Complex, New Delhi	9 <sup>th</sup> to 12 <sup>th</sup> October 2023	International

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Sambit Mallick	Philosophical Foundations of Social Research	University of Allahabad	Allahabad, virtual	04-04-23
2	Sambit Mallick	Sociology of Scientific Knowledge	Rabindra Bharati University	Kolkata, virtual	26-04-23
3	Ngamjahao Kipgen	World Environment Day	Department of Social Work, University of Science and Technology Meghalaya	Ri-Bhoi, Meghalaya	05-06-23
4	Ngamjahao Kipgen	Emerging Trends in Interdisciplinary Studies	Department of English, Banaras Hindu University	Banaras Hindu University	07-06-23

5	Ngamjahao Kipgen	Resource Person for BA Induction Programme	University of Science and Technology Meghalaya	Ri-Bhoi, Meghalaya	12-06-23
6	Sambit Mallick	Science, Technology and Area Studies	Banaras Hindu University	Varanasi, virtual	08-07-23
7	Sambit Mallick	Social Science Research in the Indian Institutes of Technology	Bangladesh Institute of Social Research	Dhaka, Bangladesh	13-07-23
8	Mrinal Kanti Dutta	Refresher Course for Teachers of Economics at 10+2 Level	Assam Higher Secondary Education Council	Lakhimpur Girls' College	19-07-23
9	Mrinal Kanti Dutta	Refresher Course for Teachers of Economics at 10+2 Level	Assam Higher Secondary Education Council	Lakhimpur Girls' College	19-07-23
9	Sambit Mallick	Human Values and Professional Ethics	NEMCARE Group of Institutions	Mirza, Guwahati	09-08-23
10	Mrinal Kanti Dutta	Key note Address of the National Seminar on Understanding the North East: Issues and Concerns	Mahapurusha Srimanta Sankardeva Vishwavidyalaya	Nagaon	10-08-23
11	Mrinal Kanti Dutta	G20 and India's Presidency	All India Radio Guwahati and Mangaldai College	Mangaldai College	19-08-23
12	Sambit Mallick	Epistemology–Ontology Relations	University of Science and Technology Meghalaya	Meghalaya	19-08-23
13	Sukanya Sharma	Amrit Kaal Vimarsh	National Institute of Technology Shillong	Shillong	12-10-23
14	Sambit Mallick	Information and Communication Technologies	University of Allahabad	Allahabad, virtual	14-10-23
15	Sambit Mallick	Livelihoods not confined to the rural	Indian Statistical Institute Giridih	Giridih, virtual	06-11-23
16	Sambit Mallick	Society, Law and Technology	Aligarh Muslim University	Aligarh, virtual	23-11-23
17	Sambit Mallick	Methods in Social Science Research	Indian Institute of Technology Kharagpur	Kharagpur, virtual	07-12-23
18	Sambit Mallick	Keynote Address: Social Science Research, Institutions and Development in North-East India	University of Science and Technology, Meghalaya	Meghalaya	06-01-24
19	Sambit Mallick	Science, Technology and Society: An Overview	National Council of Science Museums	Kolkata	23-01-24

20	Sambit Mallick	Methods of Science	National Council of Science Museums	Kolkata	23-01-24
21	Sambit Mallick	Ethos of and Inequalities in Science	National Council of Science Museums	Kolkata	24-01-24
22	Sambit Mallick	Intellectual Property Rights	National Council of Science Museums	Kolkata	24-01-24
23	Pahi Saikia	Understanding India's Eastern and Northeastern Borderlands: Space, Territoriality and Mobility	Assam University	Diphu campus	01-02-24
24	Sambit Mallick	Philosophical Foundations of Social Research	National Institute of Technology Nagaland	Dimapur, Nagaland	04-03-24
25	Sambit Mallick	Research Paradigms in the Social Sciences	National Institute of Technology Nagaland	Dimapur, Nagaland	04-03-24
26	Ngamjahao Kipgen	Resource Person for ICSSR Sponsored Ten-Day Research Methodology Course RMC24 for M.Phil./Ph.D./PDF Scholars in Social Sciences	NIT Nagaland	Chumukeidma, Nagaland	11-03-24
27	Sukanya Sharma	Indian Language, Cultural Oneness and National Integration	Mizoram University	Aizawl	23-03-24
28	Sambit Mallick	Crafting Qualitative Research Design	Nagaland University	Nagaland University, Lumami	27-03-24
29	Sambit Mallick	Using Visual Data in Qualitative Research	Nagaland University	Nagaland University, Lumami	28-03-24
30	Priyankoo Sarmah	Language technology development and language promotion	Poula Literature council, Manipur	Senapati, Manipur	03-04-23
31	Priyankoo Sarmah	Workshop on Acoustic Analysis of Speech and Praaat	Central University of Rajasthan	Ajmer, Rajasthan	23-04-23
32	Priyankoo Sarmah	An overview of tones in North-East Indian Languages	Kobe City University of Foreign Studies	Online	21-04-23
33	Priyankoo Sarmah	Phonetics of Mizo tones	International Christian University	Tokyo, Japan	08-06-23
34	Priyankoo Sarmah	Phonetic Knowledge in Speech Technology Development	Central Institute of Indian Languages	Online	23-06-23

35	Priyankoo Sarmah	Vowels and Dialects: From Sociolinguistics to Language Technology	Central Institute of Indian Languages	Online	24-06-23
36	Priyankoo Sarmah	Phonetics of voiceless nasals in Tibeto-Burman languages	International Christian University	Tokyo, Japan	03-06-23
37	Priyankoo Sarmah	Speech Technology Development in Mizo Learning from Machine Learning	Indira Gandhi Delhi Technical University for Women	New Delhi	26-12-23

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date
1	Dr. Rahul A Sirohi	Department of Humanities and Social Sciences, Indian Institute of Technology, Tirupati	Decolonising Development: Liberatory Epistemologies from India and Latin America	11-04-23
2	Prof. Duane Rousselle	Nazarbayev University in Nur Sultan	Infinite Conversations: Reinvention of the Unconscious in Psychoanalysis	19-04-23
3	Prof. H S Komalesha	IIT Kharagpur	Between Artistry and Authenticity: Conundrums of Translating Vaddaradhane	21-08-23
4	Dr Debarchana Baruah	University of Tübingen	Undocumented Migrants: Border-Crossing, Illness, and Labor	22-08-23
5	Anjum Hasan		Book: History's Angel	23-08-23
6	Amb Anil Trigunayat	Confederation of Education Excellence	Israel-Hamas War and the Palestine Question	18-10-23
7	Dr Roluahpuia	IIT Roorkee	Nationalism in the Vernacular: State, Tribes, and the Politics of Peace in Northeast India	02-11-23
8	Mr. Manas Gubbi	Programme Manager responsible for outreach to state legislators in PRS	Introduction to Parliamentary Functioning	11-01-24
9	Dr Vasundhara Jairath	IIT Guwahati	Land Rights, Private Property and Social Reproduction in Assam: Reflections from the field	22-01-24

10	Prof. Bhaskarjit Neog	Centre of Philosophy, School of Social Sciences, Jawaharlal Nehru University	What Responsibility? Whose Responsibility? Intention, Agency, and Emotions of Collective Entities	22-03-24
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#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1	Mrinal Kanti Dutta	Orientation Programme for Teachers/Lecturers teaching at 10+2 level	Assam Higher Secondary Education Council Guwahati	19-07-23	National	50
2	Sambit Mallick	Application and Relevance of Quantitative and Qualitative Methods in Indian Social Science Research	National Institute of Technology Nagaland and Indian Institute of Technology Guwahati	04-03-24	National	40
3	Sambit Mallick	Application and Relevance of Quantitative and Qualitative Methods in Indian Social Science Research	National Institute of Technology Nagaland and Indian Institute of Technology Guwahati	04-03-24	National	40
4	Rajshree Bedamatta	Comparative Reflections on Gender in Higher Education in India (Special Focus on NEP 2020 and the States of North East)	IIT Guwahati and National Institute of Education Planning and Administration (NIEPA)	05-03-24	International	130

## STUDENTS' ACHIEVEMENTS

- Prarthana Dutta: Best paper award; King's India Institute (King's College London).
- Preeti Sannyashi: Award for best presentation (one among 2 best presenters); Gifu University Japan.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Barua Anamika	University of Leeds, UK	Professor	Climate Change and Water security, Ecological Footprint, Virtual Water flows through trade, Water governance including transboundary water governance
02	Basu Debapriya	Jadavpur University	Associate Professor	English and European Renaissance literature, early modern English women's writing, women's literary history, gender and genre, poetics and gender, theatre, textual editing and bibliographical studies, translation, digital humanities theory and practice (text technologies, TEI-XML, hypertextualities, digital archives, the digital early modern)
03	Bedamatta Rajshree	University of Calcutta	Professor	Food security, Nutrition, and Public Health
04	Das Debarshi	Jawaharlal Nehru University	Professor	Development Economics, Political Economy, Macroeconomics
05	Das Liza	<i>NULL</i>	Professor	Cultural Studies
06	Dutta Mrinal Kanti	Gauhati University	Professor	Agricultural Economics, Environmental Economics, Regional Economic Development
07	Dutta Vipul	Kings College London	Assistant Professor	South Asian Diplomatic & Military History ; Indian Business History



08	Hussain Dilwar	IIT Kanpur	Professor	Psychology of Trauma, Psychology of Well-being
09	Jairath Vasundhara	University of Delhi	Assistant Professor	Social Movements, Development and Displacement, Indigenous Politics, Latin America, Decolonisation of Knowledge
10	Jha Mithilesh Kumar	University of Delhi	Assistant Professor	Political theory, Political thought in comparative perspectives particularly Indian and western political thought, Indian politics especially language and related issues of state formation in modern India
11	Kashyap Naveen	IIT Bombay	Professor	Sleep and Information Processing, Human Memory
12	Keshavamurthy Kiran	University of California, Berkeley	Assistant Professor	Modern Indian Literatures
13	Kipgen Ngamjahao	Indian Institute of Technology Delhi	Associate Professor	Environmental sociology, political sociology, religion and cultural politics
14	Mahanta Amarjyoti	Jawaharlal Nehru University, Centre for Economic S...	Associate Professor	Game Theory, Auction Theory, Industrial Organization
15	Mahanta Shakuntala	Utrecht University, The Netherlands	Professor	Theoretical Phonology, Acoustic Phonetics and perception, Information Structure, Tone and intonation
16	Mallick Sambit	University of Hyderabad	Professor	Sociology of Science and Technology; Historical Sociology; Philosophy of the Social Sciences
17	Prabhu Venkataraman		Professor	
18	Punekar Rohini Mokashi	Gujarat University	Professor	Translation, Postcolonial Studies, Culture Studies, Indian Writing in English and Modern British Literature.

19	Ray Sawmya	University of Hyderabad (Hyderabad Central University)	Professor	Gender Violence and Law, Sex Trafficking and Sex Work, Gender and Legal Pluralism, Caste in Urban Spaces.
20	Saikia Arupjyoti	University of Delhi	Professor	Economic, environmental and political history of modern Assam
21	Saikia Pahi	McGill University, Canada	Professor	International Relations; Foreign Policy between India and neighbouring countries; Ethnic identity politics, tribes and indigenous people in Northeast India; Governance & political development in developing areas; Security issues in borderlands Asia; Social movements and conflict prevention.
22	Sarkar Agnirup	Durham University	Assistant Professor	Macroeconomics, Monetary Economics, Finance
23	Sarmah Priyankoo	University of Florida	Professor & Head	Phonetics and phonology of vowels and tones, Tibeto-Burman languages, language technology development, speech perception, speech recognition
24	Sengupta Bodhisattva	McGill University	Associate Professor	Public Economics and Policy, Dynamic Economic Theory
25	Sharma Sukanya	Deccan College PG & Research Institute, Poona	Professor	Archaeology
26	Som Bidisha	Jawaharlal Nehru University, New Delhi	Professor	language processing, culture and cognition, social linguistics.
27	Thomas John	Centre for Historical Studies, Jawaharlal Nehru University	Assistant Professor	Religion and Formation of Cultural and Political Identities; Religion and Politics in North-East India; Social and Intellectual History of 19th Century Travancore; History of Missionary Encounter in South Asia.

28	Tripathi Nachiketa	IIT Kanpur, India	Professor	Organizational Behaviour, HRM and Social Psychology
29	Kashyap Abhishek	IIT Bombay, India	Assistant Professor	Research Interests: Philosophy of Science, Philosophy of Physics, Bayesian Epistemology, Social Epistemology

# Mathematics

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT:** 1995

**ACADEMIC PROGRAMMES OFFERED:**

Bachelor of Technology in Mathematics & Computing [Four Year Programme]

Master of Science in Mathematics and Computing [Two Year Programme]

Master of Science in Mathematics [Two Year Programme]

Doctor of Philosophy in Mathematics

Master of Technology in Data Science [Two Year Programme] Jointly offered with the Dept. of CSE and EEE

**LABORATORY FACILITIES**

Maths E-block Laboratory : Seating capacity :  $74+71 = 145$

Maths E1-block Laboratory : Seating capacity :  $138$  (ground floor) +  $154$  (2<sup>nd</sup> Floor) =  $292$

Two Research Scholars Laboratories: Total capacity :  $100$  (Located in E and E1 blocks)

All laboratories are equipped with LAN and wireless network connectivity. An LCD projector with motorized screen is available in each laboratory for tutorial and demonstration sessions. Almost all the students who are enrolled in B.Tech., M.Sc. and regular Ph.D. programmes are allotted an individual computer in these laboratories.

In addition to the standard personal computers in the laboratories, the department has several workstations, high-end servers and a storage area network. All laboratories except research scholars laboratories are equipped with CCTV cameras.

**MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

Acer Veriton M4690G Desktop PC	29 Nos.	15,26,280.00
Water cooler cum purifier	01 No.	1,05,100.00
LCD Projector on buyback basis	02 Nos.	99,904.00
48 Port Network Switch	02 Nos.	1,35,110.00

**CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
01	Dr. Ayon Ganguly	International Conference on Mathematical Methods in Reliability	Murcia, Spain	May 30-June 02, 2023	International
02	Dr. Ayon Ganguly	National Seminar on Recent Trends in Statistics	Shillong, India	November 07, 2023	National
03	Dr. Sreekrishna Palaparthi	1-2-3 Curves, Surfaces and 3-manifolds	Haifa, Israel	7/5/2023-11/5/2023	International
04	Dr. Sreekrishna Palaparthi	International Colloquium on Randomness Geometry and Dynamics	IISER Pune, India	1/1/2024-5/1/2024	International

05	Prof. Ashok Singh Sairam	IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS)	Jaipur, India	17/12/2023 to 20/12/2023	International
06	Dr. Satyajit Pramanik	10 <sup>th</sup> International Congress on Industrial and Applied Mathematics (ICIAM 2023 Tokyo)	Waseda University, Tokyo, Japan	20/08/2023-25/08/2023	International
07	Dr. Satyajit Pramanik	38th Annual Conference of the Ramanujan Mathematical Society	IIT Guwahati, Guwahati, India	22/12/2023-24/12/2023	National
08	Prof. Rafikul Alam	25 <sup>th</sup> Conference of the International Linear Algebra Society (ILAS2023)	Madrid, Spain	June 12-16, 2023	International
09	Prof. Rafikul Alam	International Conference on Spectral and Approximation Theory	Cochin, India	November 27-30, 2023	International
10	Prof. Rajen Kumar Sinha	International Conference on Recent Advances in Applied Mathematics (RAAM 2023)	Dubai, UAE	June 20-22, 2023	International
11	Prof. Rajen Kumar Sinha	10th International Congress on Industrial and Applied Mathematics (ICIAM 2023)	Tokyo, Japan	August 20-25, 2023	International
12	Prof. N. Selvaraju	10th International Congress on Industrial and Applied Mathematics (ICIAM-2023)	Waseda University, Tokyo, Japan	20.08.2023 to 25.08.2023	International
13	Dr. Shyamashree Upadhyay	International Conference on Algebraic geometry, Coding theory and Combinatorics – 2023	IIT Hyderabad	4-8 Dec 2023	International
14	Gautam Kumar Das	10th Annual International Conference on Algorithms and Discrete Applied Mathematics	IIT Bhilai, Raipur	February 15-17, 2024	National
15	Prof. Partha Sarathi Mandal	25th International Conference on Distributed Computing and Networking	Chennai, India	January 4-7, 2024	International
16	Prof. Partha Sarathi Mandal	20th International Conference Distributed Computing and Intelligent Technology	Bhubaneswar, India	January 17-20, 2024,	International
17	Dr. Arup Chattopadhyay	Conference on Functional Analysis and Fractals, Department of Mathematics, IIT Allahabad	IIT Allahabad	February 16 - 18, 2024	International
18	Dr. Arup Chattopadhyay	38th Annual Conference of Ramanujan Mathematical Society, Department of Mathematics, IIT Guwahati	IIT Guwahati	December 22- 24, 2023	National
19	Dr. Subhamay Saha	INFORMS Applied Probability Society Conference	Nancy, France	June 28-30, 2023	Xxx
20	Dr. Sweta Tiwari	18 <sup>th</sup> Discussion Meeting in Harmonic Analysis	IIT Guwahati	December 18-21, 2023	International

21	<b>Dr. Sweta Tiwari</b>	<b>38<sup>th</sup> Annual Conference of the Ramanujan Mathematical Society</b>	IIT Guwahati	<b>December 22-24, 2023</b>	<b>National</b>
22	Prof. M. Guru Prem Prasad	21st World Congress of IMACS	Rome, Italy	11/09/2023 to 15/09/2023	International

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Prof. Siddhartha Pratim Chakrabarty	Sustainable Finance: The Shifting Landscape and ESG Driven Investment	Department of Management Studies, Indian Institute of Science	Bengaluru	12.06.2023
02	Prof. Siddhartha Pratim Chakrabarty	Portfolio Optimization and Capital Asset Pricing	Online Faculty Development Programme on Recent Trends in Mathematical Sciences, Hansraj College and Dyal Singh College, University of Delhi	Delhi (Delivered Online)	<b>11.09.2023</b>
03	Prof. Siddhartha Pratim Chakrabarty	Financial Risk Management: A Commentary in the Paradigm of Basel Regulations	Online Faculty Development Programme on Modelling of Complex Systems using Mathematics, Vellore Institute of Technology	Vellore (Delivered Online)	<b>10.11.2023</b>
04	Prof. Siddhartha Pratim Chakrabarty	How Mathematics Helps Plan Your Investment Strategy?	Subject Enrichment Workshop for Training of Kendriya Vidyalaya Sangathan (KVS) Teachers, Kendriya Vidyalaya IIT Guwahati	Guwahati	<b>04.12.2023</b>
05	Prof. Siddhartha Pratim Chakrabarty	Introduction to Financial Analytics	Professional Development Workshop for Delegates of Royal University of Bhutan, Indian Institute of Technology Guwahati	Guwahati	<b>19.12.2023</b>

06	Dr. Sreekrishna Palaparthi	Reducing spheres for genus-2 Heegaard splittings of $S^3$ , Special Topology Seminar	Department of Mathematics, Rice University.	Houston, Texas, USA	3/11/2023
07	Prof. Ashok Singh Siaram	Inference Privacy In Multi-Agent systems(MAS)	Workshop on ensuring Security, Trust, and Privacy in Industrial IOT systems, as part of the IEEE International Conference on Advanced Networks and Telecommunications Systems 2023	Jaipur, India	18/12/2023
08	Prof. Rupam Barman	Distribution of prime numbers	Assam University	Online	14/03/2024
09	Dr. Satyajit Pramanik	Deformation-driven mixing in a soft porous medium	SRM University AP, Amaravati,	Andhra Pradesh, India	13/09/2023
10	Dr. Satyajit Pramanik	Understanding flow and transport through porous media	Vellore Institute of Technology (VIT)	Vellore – 632014, Tamil Nadu	09/05/2023
11	Prof. Rajen KumarSinha	Analysis of the semidiscrete errorestimates of finite element method for the heat equation	Institute of Mathematicsand Applications	Bhubaneswar, Odisha, India	27/05/2023
12	Prof. Rajen KumarSinha	Analysis of local a-posteriori errorestimates of finite element method for nonlinear boundarycontrol problems	BITS, Dubai Campus	Dubai, UAE	20/06/2023
13	Prof. Rajen KumarSinha	A-posteriori error estimates for parabolic optimal control problems with controls acting on lower dimensional manifolds	Waseda University	Tokyo, Japan	23/08/2023
14	Prof. Rajen KumarSinha	Composite finite element methodfor heat equations in nonconvex polygonal domains	IIT Kanpur	Kanpur, India (Online Mode)	20/01/2024
15	Prof. Rajen KumarSinha	Two-scale composite finite element method for heat equations in nonconvex polygonal domains	Canadian University	Dubai, UAE (Online Mode)	23/03/2024
16	Dr. Shyamashree Upadhyay	Initial ideals of tangent cones to Richardson varieties in the symplectic Grassmannian (Poster)	IIT Guwahati	IIT Hyderabad	5 Dec 2023
17	Prof. S Pati	Limits of Centroids	Dept of Mathematics, Gauhati University	Guwahati	26/06/23
18	Prof. S Pati	Some observations on algebraic connectivity of graphs	05C50 Online	Organised by Univ Manitoba	19/05/23



19	Prof. S Pati	Repeated Sums	Royal Global university	Guwahati	29-09-2023
	Prof. S Pati	Linear Algebra 6 lectures	TEW: Multivariate Analysis and Linear Algebra, Guwahati University	Guwahati	11-03-24 to 16-03-24
20	Dr. Arup Chattopadhyay	Trace Formulae in Perturbation Theory	Department of Mathematics, NIT Silchar	NIT Silchar	14 <sup>th</sup> March, 2024
21	Dr. Arup Chattopadhyay	Higher Order Trace Formulas in Several Variables	Department of mathematics, IIIT Allahabad	IIIT Allahabad	17 <sup>th</sup> February, 2024
22	Dr. Palash Ghosh	Introduction to Clinical Trials: Statistical Perspectives	IIT Hyderabad	Department of Mathematics, IIT Hyderabad	12/01/2024
23	Dr. Palash Ghosh	Towards Personalized Medicine: Sequential Multiple Assignment Randomized Trials (SMARTs)	IIT Hyderabad	Department of Mathematics, IIT Hyderabad	17/01/2024
24	Dr. Chandan Pal	Discrete-time zero-sum games for Markov chains with risk-sensitive average cost criterion	AMNS-2023	Nepal	May 2023
25	Dr. Chandan Pal	Discrete-time zero-sum games for Markov chains with risk-sensitive average cost criterion	APS 2023	France	June 2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Dr. Prem Prakash Pandey	IISER Berhampur	Primes of Higher Degree	25/05/2023	Dr. Prem Prakash Pandey
02	Prof. Partha Sarathi Mandal	Indian Statistical Institute	Visiting Professor	May - July 2023	
03	Prof. Partha Sarathi Mandal	<b>Luiss Guido Carli University, Rome, Italy</b>	Visiting Professor	Apr - May 2023	
04	Dr. Safdar Quddus	Department of Mathematics, Indian Institute of Science Bangalore	Research Collaboration Visit at IIT Guwahati	21st November, 2023	SERB-Research Scientist
05	Prof. John Meakin	University of Nebraska-Lincoln, USA	Research Discussions. Also delivered a lecture titled "Inverse semigroups and Leavitt path algebras"	02/02/2024	Visited during 31/01/2024 – 07/02/2024

## SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Dr. Pratyoosh Kumar and Dr. Jitendriya Swain	NCM Workshop on Representation theory and Harmonic Analysis	National Centre for Mathematics, IIT Bombay	11-16 December 2023	National	45
02	Dr. Pratyoosh Kumar and Dr. Jitendriya Swain	18th Discussion Meeting in Harmonic Analysis (In honour of centenary year of Harish Chandra)	NBHM, SERB	18-21 December 2023	International	120
03	Prof. Sukanta Pati, Prof. Rupam Barman and Dr. Bikash Bhattacharjya	38 <sup>th</sup> Annual Conference of The Ramanujan Mathematical Society	NBHM	22/12/2023-24/12/2023	National	460
04	Dr. Satyajit Pramanik	Applied Mathematics Symposium: Artificial Intelligence meets Fluid Dynamics (Online)	N/A	07/07/2023	International	50 (Approx.)
05	Prof. Rajen Kumar Sinha	Symposium on Numerical Analysis	38 <sup>th</sup> Annual Conference of Ramanujan Mathematical Society	22/12/2023 to 24/12/2023	National	16
06	Dr. Arup Chattopadhyay (Organizing Committee Members)	38th Annual Conference of Ramanujan Mathematical Society	NBHM, HoMI@IIT GN, INSA	December 22- 24, 2023	National	400 +
07	Dr. Arup Chattopadhyay (Organizing Committee Members)	18th Discussion Meeting in Harmonic Analysis (In honour of centenary year of Harish Chandra)	SERB, NBHM, IIT Guwahati	December 18- 21, 2023	International	70 +
08	Dr. Sweta Tiwari (Member of Organizing Committee)	18 <sup>th</sup> Discussion Meeting in Harmonic Analysis	DST	December 18-21, 2023	International	

## AWARDS AND HONOURS

- Dr. Satyajit Pramanik: Scientific High Level Visiting Fellowship 2023 (Short Research Trip to France); French Institute in India (IFI), Embassy of France in India.
- Dr. Satyajit Pramanik: ICIAM 2023 Travel Award; National Board for Higher Mathematics, Department of Atomic Energy, Govt. of India.
- Prof. S Pati: Selected as Editor for a Journal; Communications in Combinatorics and Optimization.
- Dr. Arup Chattopadhyay: Core Research Grant; SERB, DST, Government of India.

## STUDENTS' ACHIEVEMENTS

- Dr. Chandan Pradhan: Institute of Eminence (IoE) post-doctoral fellowship at IISc Bangalore.
- Dr. Chandan Pradhan: NBHM Postdoctoral Fellowship.
- Mr. Sagar Saha: Best Paper Presentation Award; International Seminar on Topology, Algebra, and Applications (ISTAA-2024).
- Akash Kalita: PMRF; Ministry of Education, GOI.
- Amit Ghosh: PMRF; Ministry of Education, GOI.
- Koushik Bhakta: PMRF; Ministry of Education, GOI.
- Monti Das: PMRF; Ministry of Education, GOI.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Or g PhD degree received from	Designation	Areas of Interest
01	Dr. Rafikul Alam	IIT Bombay	Professor	Numerical Functional Analysis, Numerical Linear Algebra
02	Dr. Rupam Barman	IIT Guwahati	Professor	Number Theory
03	Dr. Shreemayee Bora	IIT Guwahati	Professor	Eigenvalue Problems, Spectral Perturbation Theory
04	Dr. Swaroop Nandan Bora	Technical University of Nova Scotia (now called DalTech, Dalhousie University), Halifax, Nova Scotia, Canada.	Professor	Water Wave Mechanics, River Mechanics, Sloshing Dynamics, Flow through Porous Media, Differential Equation, Fractional Differential Equation
05	Dr. Siddhartha Pratim Chakrabarty	University of Illinois at Chicago, Chicago, USA	Professor	Mathematical Finance and Mathematical Biology
06	Dr. Durga Charan Dalal	IIT Kharagpur	Professor	Computational Fluid Dynamics, Two-phase Flows
07	Dr. Gautam Kumar Das	Indian Statistical Institute, Kolkata	Professor	Computational Geometry, Approximation Algorithms, Wireless Networks
08	Dr. Bhupen Deka	IIT Guwahati	Professor	Numerical Analysis, Finite Element Method, Interface Problems
09	Dr. Jiten Chandra Kalita	IIT Guwahati	Professor	Computational and Topological Fluid Dynamics, Numerical methods for Partial

				Differential Equations, Mathematical Biology
10	Dr. Kalpesh Kapoor	London South Bank University, U.K	Professor	Blockchain Science and Technology, Word Combinatorics
11	Dr. K V Krishna	IIT Delhi	Professor	General Algebra, Theoretical Computer Science
12	Dr. Partha Sarathi Mandal	Indian Statistical Institute (ISI), Kolkata (degree awarded by Jadavpur University), India	Professor	Distributed Algorithms for Swarm Robots Algorithmic aspects of Wireless Sensor Networks Approximation Algorithms for Sweep Coverage Localization, Secure localization Fault-Tolerant Distributed Algorithms Self-stabilization
13	Dr. Sukanta Pati	Indian Statistical Institute, Delhi	Professor	Spectral Graph Theory; Matrix Theory
14	Dr. M Guru Prem Prasad	IIT Kanpur	Professor	Complex Dynamics and Fractals
15	Dr. Anupam Saikia	University of Cambridge, UK	Professor	Number Theory
16	Dr. Ashok Singh Sairam	IIT Guwahati	Professor	Computer Networks and Network Security
17	Dr. Bhaba Kumar Sharma	University of Delhi	Professor	Combinatorial Matrix Theory (Graph Spectra, Matrix Completion Problems) Finite Fields and applications in Cryptography
18	Dr. N Selvaraju	IIT Madras	Professor	Queueing Theory, Financial Mathematics, Stochastic Modelling, Operations Research
19	Dr. Rajen Kumar Sinha	IIT Bombay	Professor	Numerical Analysis (Numerical Analysis of PDEs)
20	Dr. Natesan Srinivasan	Bharathidasan University	Professor	Numerical solution to Differential Equations, Numerical Homogenization
21	Dr. Bikash Bhattacharjya	IIT Kanpur	Associate Professor	Graph Theory

22	Dr. Arbin Kumar Dey	IIT Kanpur	Associate Professor	Distributions, models and Applications; Machine learning and Time Series Analysis; Advanced Statistical Algorithms; & nbsp; System Biology, Biomedical Applications, Ensemble Learning
23	Dr. Pratyoosh Kumar	IIT Kanpur	Associate Professor	Harmonic Analysis
24	Dr. Rajesh Srivastava	IIT Kanpur	Associate Professor	Harmonic Analysis
25	Dr. Jitendriya Swain	IIT Madras	Associate Professor	Harmonic Analysis
26	Dr. Sweta Tiwari	IIT Delhi	Associate Professor	Differential Equation
27	Dr. Vinay Wagh	University of Pune	Associate Professor	Algebraic Geometry
28	Dr. Sriparna Bandopadhyay	Indian Statistical Institute, Delhi	Assistant Professor	Linear Algebra, Matrices
29	Dr. Anjan Kumar Chakrabarty	IIT Kanpur	Assistant Professor	Functional Analysis
30	Dr. Arup Chattopadhyay	JNCASR Bangalore	Assistant Professor	Functional Analysis and Operator Theory
31	Dr. Sagarmoy Dutta	IIT Kanpur	Assistant Professor	Quantam Computing, Complexity Theory
32	Dr. Ayon Ganguly	IIT Kanpur	Assistant Professor	Life Time Data Analysis
33	Dr. Palash Ghosh	Indian Statistical Institute, Kolkata	Assistant Professor	Statistics and Biostatistics, Q-learning (Reinforcement Learning) and Dynamic Treatment Regime (DTR), Personalized Medicine, Ordinal Outcome and Ordinal Regression, Multi-Sample Likelihood, Case-Control Study, Design and Analysis of Clinical Trials, Analysis of Electronic Medical Records Data and Surveillance (COVID-19)

34	Dr. P A S Sree Krishna	University at Buffalo, The State University of New York, USA	Assistant Professor	low dimensional topology hyperbolic geometry hyperbolic manifolds
35	Dr. Chandan Pal	IIT Bombay	Assistant Professor	Stochastic Control Theory and Mathematical Finance
36	Dr. Satyajit Pramanik	IIT Ropar	Assistant Professor	Mathematical Modelling, Scientific Computing, Flow Through Porous Media
37	Dr. H Ramesh	IIT Madras	Assistant Professor	Formal Languages and Automata Theory, Unconventional Models of Computing (In particular Membrane Computing )
38	Dr. Shubhamay Saha	IISc Bangalore	Assistant Professor	Probability and Stochastic Process
39	Dr. K V Srikanth	University at Buffalo, The State University of New York, USA	Assistant Professor	Low Dimensional Topology
40	Dr. Syamashree Upadhyay	Chennai Mathematical Institute, Chennai	Assistant Professor	Algebraic Combinatorics

# Mechanical Engineering

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT: 1995**

**ACADEMIC PROGRAMMES OFFERED:**

Bachelor of Technology (BTech) in

i. Mechanical Engineering

Master of Technology (MTech) in

- (1) Machine Design,
- (2) Fluid and Thermal Engineering,
- (3) Manufacturing Science and Engineering,
- (4) Computational Mechanics,
- (5) Aerodynamics and Propulsion

Doctor of Philosophy (PhD)

**LABORATORY FACILITIES**

**Department Labs:**

- Advanced Manufacturing Laboratory: Equipped with advanced equipments for manufacturing including micro-fabrication facility using CO<sub>2</sub> Laser cutting technology.
- Strength of Materials Laboratory: Basically dedicated for doing all kinds of testing including tensile testing, fatigue testing, compressive testing, torsion testing, hardness testing, impact testing etc.
- Materials Science Laboratory: Dedicated for carrying out metallographic studies using highly precise microscope, XRD etc.
- Fluid Mechanics Laboratory: This lab has basic fluid mechanics set-up. The lab is equipped with different flow measuring set-ups such as venturimeter, orifice-plate, pitot tube, rotometer etc., where students can visualize the basic theory of working of the flow meter.
- Thermal Science Laboratory: This lab consists of heat exchangers, equipments for conducting experiments on conduction, convection and radiation, refrigeration systems etc. All these equipments facilitate learning of basic Thermodynamics and Thermal Engineering at undergraduate level.
- Turbo-machinery Laboratory: This lab has different tabletop model of pumps and turbines where students can study the performance characteristics of those machines. Students can strengthen their basic understandings of working and applications of these machines.
- IC Engine Laboratory: This lab is for both undergraduates and graduate students. Some of the experiments which are performed by under-graduate students are performance studies of both C.I. and S.I. engines, etc. Moreover, studies on the calorific values, exhaust gas characteristics, extensive studies of bio-diesel with both engines are done by post-graduate students in their respective project works.
- Vibrations and Acoustics Laboratory: This lab demonstrates basic vibrational instruments to students at undergraduate level. Also provides facilities for measurement of frequency signals, rpm etc, and facilities for data-acquisition which are very much beneficial for research activities in the domain of vibrational analysis.
- Instrumentation and Control Laboratory: This lab performs calibration of pressure transducer/ gauge and other mechatronics apparatus, provides strain-gauge measurement facilities etc.
- Theory of Machines Laboratory: This lab consists of all basic equipments for understanding mechanisms, apparatus etc. at undergraduate level such as gyroscope, governor, jib-crane, screw jack, worm-wheel apparatus etc.
- Tribology Laboratory: Provides facilities for carrying out wear test of specimens of different materials under the condition of with lubrication/without lubrication.



- CAD/CAM Laboratory: Specialized in extending computer-assisted software tools needed for design and analysis such as ABAQUS, ANSYS, Master CAM, Pro/E, ADAMS etc.
- 3D Printer Laboratory: Provides facilities for 3D printing.

### Department Research Labs: 19 Research Labs

- Dynamics and Vibration Lab
- AnuPravaha CFD Lab
- Biomedical Devices and Biomaterials laboratory
- Biomimetics and Artificial Intelligence Laboratory
- CFD Lab
- Composite Structures and Fracture Mechanics Lab: Caters to the development of composite laminates and enables NDT through ultrasonic scanning of the composite structures.
- Computational Mechanics and Optimization Lab
- Electromechanics and Microsystems Lab
- Gas Dynamics Lab
- Materials and Design in Mechanical Systems & Science and Technology in Traditional Systems
- Mechatronics and Robotics Laboratory: The Mechatronics and Robotics lab is equipped with various facilities to educate the students at the undergraduate and postgraduate levels. Most of the robotics activities are facilitated to students by this lab.
- Micro-machining Lab
- Microfluidics and Microscale Transport Processes Laboratory
- Miniature Thermal Systems Research Laboratory
- Precision Manufacturing Lab
- Smart Materials and Structures Lab
- Thermal Hydraulics and Gasification Lab
- Welding Lab
- Wind Tunnel Laboratory: Provides facilities for carrying out wind tunnel related experiments.

### MAJOR AREAS OF RESEARCH AND DEVELOPMENT

<b>Fluids and Thermal Engineering</b>	<b>Machine Design Engineering</b>	<b>Manufacturing Engineering</b>
<ul style="list-style-type: none"> <li>• Computational Methods for Incompressible Flows</li> <li>• DNS and LES of Turbulence</li> <li>• Energy management and conservation</li> <li>• High speed aerodynamics</li> <li>• Interfacial heat and mass transport</li> </ul>	<ul style="list-style-type: none"> <li>• Acoustics</li> <li>• Active Materials</li> <li>• Composites</li> <li>• Dynamics and Vibrations</li> <li>• Finite Element Method and Analysis</li> <li>• Fracture Mechanics and Design</li> <li>• Mechatronics</li> <li>• Robotics and Control</li> <li>• Micromechanics</li> </ul>	<ul style="list-style-type: none"> <li>• Bio-MEMS</li> <li>• Casting</li> <li>• CAD/CAM/CIM</li> <li>• Coating</li> <li>• Composites</li> <li>• Computer Application in Metal Forming</li> <li>• Design and Manufacturing</li> <li>• Electromagnetic pulse processing</li> <li>• FEM, Neural Network</li> <li>• Fuzzy Set Application</li> <li>• Genetic Algorithms and Fuzzy logic in manufacturing</li> <li>• Mechatronics</li> </ul>

<ul style="list-style-type: none"> <li>• Metal hydride based thermal machines</li> <li>• Micro and nano-scale thermal/fluid transport</li> <li>• Micro-fuel cells</li> <li>• Thermal aspects of biological systems</li> <li>• Thermal radiation</li> </ul>	<ul style="list-style-type: none"> <li>• Nanocomposites</li> <li>• Rolling Element Bearings Design and Analysis</li> <li>• Smart Structures</li> <li>• Tribology</li> </ul>	<ul style="list-style-type: none"> <li>• Metal Forming</li> <li>• Unconventional machining processes</li> <li>• Welding of light weight metals</li> <li>• Welding Process Monitoring and Control</li> </ul>
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### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1.	U. K. Saha	Indian Space Missions: From Aryabhata to Chandrayaan 3	NIT Silchar	Silchar, Assam	February 27, 2024
2.	U. K. Saha	Pursuing a Career in Mechanical Engineering	ASTEC and IIT Guwahati	Guwahati, Assam	February 08, 2024
3.	U. K. Saha	Spaceflight without Formulae	Nowgong Polytechnic	Nagaon, Assam	November 22, 2023
4.	U. K. Saha	Small Wind Turbines: Fundamentals, Recent Trends and Opportunities	Department of Agriculture & Farmers Welfare, GOI	Hyderabad, Telangana	November 8, 2023
5.	U. K. Saha	Liquid Rocket Propulsion	KIIT, Bhubaneswar	Bhubaneswar, Odisha	November 06-15, 2023
6.	U. K. Saha	Indian Space Missions	NIT Meghalaya	Shillong, Meghalaya	September 05, 2023
7.	U. K. Saha	Harnessing Wind Energy for Local Power Production	Assam Agricultural University Extension Centre	Khanapara, Guwahati, Assam	July 13, 2023
8.	P.K.Mondal	Plant Root Dynamics: The Role of Microfluidics	Manipal Institute of Technology Bengaluru	Bengaluru, Karnataka	July 12-14, 2023
9.	P. K. Mondal	Studies of the effect of abiotic stress on the plant root system using phytofluidic approaches	IQSE Seminar Room, University of Teaxs (A&M), USA	Texas, USA	February 14, 2024
10.	Pankaj Biswas	Some Advanced Research on Welding Technology	Golden Jubilee Celebration of Kolkata Branch of The Indian Institute of Welding by	Indian Institute of Welding, Kolkata	March 11 & 12, 2023

			organizing “Weld 2023”, the Annual Seminar		
11.	Pankaj Biswas	Principle and Safety of Underwater Welding	5-day workshop on Underwater Welding, IIT Guwahat	Guwahati, Assam	10th-14th October, 2023
12.	Pankaj Biswas	Thermo-mechanical Transient Elasto-plastic Analysis of Underwater welding fusion welding process by Commercially Available FE Package	5-day workshop on Underwater Welding, IIT Guwahati	Guwahati, Assam	10th-14th October, 2024
13.	Pankaj Biswas	Types and Principles of Underwater Welding	IIT Guwahati	Guwahati, Assam	November 6, 2023
14.	Pankaj Biswas	Safety and Equipments for Safety of Underwater Welding	IIT Guwahati	Guwahati, Assam	November 7, 2023
15.	Pankaj Biswas	Underwater Friction Stir Welding	IIT Guwahati	Guwahati, Assam	November 8, 2023
16.	Pankaj Biswas	Underwater SMAW, MIG Welding Details	IIT Guwahati	Guwahati, Assam	November 9, 2023
17.	Pankaj Biswas	Latest Welding Technology used in Underwater Welding	IIT Guwahati	Guwahati, Assam	November 10, 2023
18.	Pankaj Biswas	Weld Induced Residual Stress Prediction by Thermo-mechanical Transient Elasto-plastic Analysis by Commercially Available FE Package	ON-LINE COURSE (Via ZOOM) on Distortion Control in Ship Building	ASRANet Ltd. Sutton, Surrey, UK	24th - 25th August 2023
19.	Pankaj Biswas	Residual Stresses in Engineering Components: Types, Causes, Effects and Estimation,	ON-LINE COURSE (Via ZOOM) on Distortion Control in Ship Building	ASRANet Ltd. Sutton, Surrey, UK	24th - 25th August 2024
20.	Pankaj Biswas	Thermomechanical Analysis of 3D Printing Process by FE software ANSYS	International Workshop on 3D printing and additive manufacturing insights, NIT Mizoram	NIT Mizoram, India	12th- 16 March 2024
21.	Pankaj Biswas	Transient Elastoplastic Thermomechanical	VIT	India	11 September

		Analysis of 3D printing Process			
22.	Pankaj Biswas	Residual Stresses in Engineering Components: Types, Causes, Effects and Estimation	VIT	India	September 14
23.	Pankaj Biswas	Drone Manufacturing Technology	3 Month Certificate Course on Drone Technology, IIT Guwahati	Guwahati, Assam	October 10, 2023
24.	Pankaj Biswas	Drone Manufacturing Technology Process Details	3 Month Certificate Course on Drone Technology, IIT Guwahati	Guwahati, Assam	October 11, 2023
25.	Pankaj Biswas	Welding Technology Used in Drone Technology	3 Month Certificate Course on Drone Technology, IIT Guwahati	Guwahati, Assam	October 12, 2023
26.	Amaresh Dalal	The role of Computational Fluid Dynamics (CFD) in solving engineering problems	SERB-Karyashala sponsored Short Term Training on Computational Fluid Dynamics with OpenFoam	MANIT Bhopal, Bhopal, India	3rd to 9th July, 2023
27.	Amaresh Dalal	The fundamentals of Computational Fluid Dynamics (CFD) used by engineers, scientists and researcher	SERB-Karyashala sponsored Short Term Training on Computational Fluid Dynamics with OpenFoam	MANIT Bhopal, Bhopal, India	3rd to 9th July, 2023
28.	Tapan K Mankodi	Thermal Protection Systems in Re-entry Vehicles	Nirma University	Ahmedabad, Gujarat	October 26th, 2023
29.	Tapan K Mankodi	Fundamentals of Particle Computational Methods for Rarefied Gas Dynamics	Gyeongsang National University	Jinju, Republic of Korea	11-14 July, 2023
30.	Sajan Kapil	CAPP for Additive Manufacturing	INFINITY SOLUTIONS: Autodesk	Pune	25 April 2023
31.	Sajan Kapil	CAPP for Robotic DED Systems	AMChronicle	Bangalore	25-26 May 2023
32.	Sajan Kapil	Computer-Aided Process Planning for Additive Manufacturing and DFAM	Karyashala High-End Workshop: NIT Tiruchirappalli	Online	6 June 2023.

33.	Sajan Kapil	Toolpath for obtaining homogeneous microstructural and mechanical properties in wire arc additive Manufactured parts	Recent Trends in Direct energy Deposition (DED): One Day Seminar by School of Mechanical Engineering VIT, Vellore	Online	7 June 2023.
34.	Sajan Kapil	Introduction to Additive Manufacturing	Faculty Development Program (FDP), Center for De Novo Technologies & Ergonomics in Industry 4.0, GGSIPU	Delhi	25th July 2023
35.	Sajan Kapil	Research and Development Activities of AM Lab IIT Guwahati	Semiconductor Technology, Additive Manufacturing, and Packaging (STAMP-2023), IIT Guwahati	IIT Guwahati	27 Oct 2023.
36.	Sajan Kapil	Research and Development Activities at Additive Manufacturing Lab IIT Guwahati	Democratising 3D Technology with Education & Research to Benefit all 3D GEM	IIT Bombay	9-10 Dec 2023
37.	Sajan Kapil	Utilisation of Traveling Salesman Problem for Generating Toolpath to Fabricate Density based FGMs by Additive Manufacturing	ASME Area 3D conference	RMIT Bangalore	13-14 Dec 2023
38.	Sajan Kapil	Realization of Large-to-Small Objects by Metal Additive Manufacturing	Aeronautical Development Agency (ADA), Bangalore	Bangalore	15th Dec 2023
39.	Sajan Kapil	3-axis Toolpath for WAAM	Online Training Programme on “Wire-Arc Additive Manufacturing Process”, Organized by Corporate R&D BHEL	Online	18th December 2023
40.	Sajan Kapil	5-axis Toolpath for WAAM	Online Training Programme on “Wire-Arc Additive Manufacturing Process”, Organized by Corporate R&D BHEL	Online	19th December 2023

41.	Sajan Kapil	3D Printing: Introduction, Application and Research	India International Science Festival - 2023, DST	Faridabad	Jan 17-20 2024
42.	Sajan Kapil	Research and Development Activities of AM Lab IIT Guwahati	CoE Cyber Physical Defence Systems, IIT Guwahati	IIT Guwahati	Feb 2024
43.	Manmohan Pandey	Experimental Characterization and Mathematical Modelling of Micro and Miniature Loop Heat Pipes	Huawei Future Device Technology Summit 2023	Hilton Kalastajatorppa , Helsinki, Finland	October 9-11, 2023
44.	Manmohan Pandey	Miniature Cooling Devices for High Heat Flux Thermal Management	International Conference on Futuristic Advancements in Materials, Manufacturing and Thermal Sciences (ICFAMMT-2024)	IITRAM, Ahmedabad, India	January 19-21, 2024
45.	Ujendra Kumar Komal	Pushing the Envelope: Additive Manufacturing's Role in Next-Generation Composite Materials	C. V. Raman Global University	Bhubaneswar, Odisha	Dec 15, 2023
46.	Uday S. Dixit	Past, Present and Future of Mechanical Engineering (in Hindi)	International conference "Recent Trends in Engineering and Sciences" (RTES – 2023)"	online mode by SVNIT, Surat	May 2, 2023
47.	Uday S. Dixit	Optimization: Engineering Philosophy and Some Examples of its Application	One-Week Training Program on "Optimization in Engineering Design and Applications	DST-STUTI	August 4, 2023
48.	Uday S. Dixit	Mechatronic Systems for Drone Applications	Drone Technology Certificate program by CET-IITG in collaboration with CICPS-IITG, and IITG-TIDF	IIT Guwahati	October 26, 2023
49.	Uday S. Dixit	Education as per NEP 2020	workshop on National Education Policy (NEP) 2020	NIT Meghalaya	December 11, 2023
50.	Uday S. Dixit	Future trends in manufacturing technology and education	2nd International Conference on Futuristic	the Institute of Infrastructure Technology	January 19-21, 2024

			Advancements in Materials, Manufacturing and Thermal Sciences (ICFAMMT 2024)	Research and Management (IITRAM), Ahmedabad, India	
51.	Uday S. Dixit	Heat Transfer Modelling in Manufacturing: Relevance and Issues	International Conference on Thermofluids and Manufacturing Science-2024	KIIT Bhubaneswar	7-8 March, 2024
52.	Sachin Singh Gautam	Machine Learning In Computational Solid Mechanics – Review, Results, and Future	2nd International Conference on Modern Research in Aerospace Engineering	Amity University	21-22 September 2023
53.	Poonam Kumari	Two dimensional models of plates	Rajasthan Higher Technical Education Improvement Scheme (RHTEIS) Sponsored 5 Days Hybrid Mode FDP on Finite Element Methods for Engineering Application	MBM Jodhpur	17-21st August, 2023
54.	Niranjan Sahoo	Domain Lecture Series (4 Nos.) in Aerodynamics – Compressible Flow: Theory and Experimental Facilities	School of Mechanical Engineering, Kalinga Institute of Industrial Technology (KIIT)	Bhubaneswar, Odisha	02-04 November 2023
55.	Niranjan Sahoo	Renewable Energy Technology by Harnessing Wind Power	Veer Surendra Sai University of Technology (VSSUT), Burla	Sambalpur, Odisha	03 February 2024
56.	B. Sandeep Reddy	Kinematics and Dynamics of Robotic Systems	JNTU	Hyderabad, India	19 February 2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Mr. Ashirwad Parashar	GEFERTEC, GmbH, Germany	Involvement of GEFERTEC towards industrialization of the Wire-Arc Directed Energy Deposition Process	30th Jan 2024	Mr. Ashirwad Parashar

## SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Manmohan Pandey	Workshop on High Heat Flux Thermal Management Systems	SERB	March 16-17, 2024	National	25
02	Deepak Sharma and Sachin Singh Gautam	6th National Conference on Multidisciplinary Design, Analysis and Optimization	IIT Guwahati, Aeronautical Society of India, IITG TIDF, Phillips Machine Tool, CMTI, COMSOL, BosonQ Psi	6-8 December 2023	National	100

## AWARDS AND HONOURS

- Dr. P. K. Mondal: First Prize' for the presentation on 'Gravitropism on plant Root Dynamics: The role of Microfluidics'; Mizoram University.
- Dr. P. K. Mondal: Front cover art for article 'Salinity Gradient-Induced Power Generation in Nanochannels: The Role of pH-Sensitive Polyelectrolyte Layers'; ACS Langmuir.
- Dr. P. K. Mondal: Front cover art for article 'AC Electrothermal Effect Promotes Enhanced Solute Mixing in a Wavy Microchannel'; ACS Langmuir.
- Dr. P. K. Mondal: Awarded Institute of Physics(IOP) Trusted Reviewer status; IOP Publishing , The Distillery, Glassfields, Avon Street, Bristol, BS2 0GR, England.
- Dr. R. K. Mittal: DST SERB ITS Grant.
- Prof. Uday S. Dixit: The article "Energy Absorption Characteristics of Fused Deposition Modeling 3D Printed Auxetic Re-entrant Structures: A Review" chosen as Editor's Choice paper; Journal of Materials Engineering and Performance for 2023

## STUDENTS' ACHIEVEMENTS

- Umang H. Rathod: ASME Students Advisory Committee Travel Award (SACTA), USD2000; American Society of Mechanical Engineers.
- Mohamad Alhady Mohamad Ali: First Prize' for the presentation on 'Gravitropism on plant Root Dynamics: The role of Microfluidics'; Mizoram University.
- Niraj Kr Prasad: Best poster award; American Chemical Society (ACS) in the first Indian Conference on Micro nano fluidics (ICOM) held at IIT Madras.
- Agniva Ghsoh: DAAD Fellowship; The German Academic Exchange Service (DAAD).
- Sathesh Raja V: 1st runner-up price; ASME Areo 3D conference 2023.
- Umesh Melkani: 2nd runner-up price); ASME Areo 3D conference 2023.
- Ritam Sarma: Runner-up prize; The Austrian Society for Metallurgy and Materials (ASMET), Vienna/ Austria.



- Arnab Sarmah: One among the five winners of "Developing Countries Grant Competition"; International Society of Biomechanics in ISB/JSB Congress, Fukuoka, Japan.
- Mr. Abir Saha: 2024 Winter Research Internship Program; Polytechnique Montréal, Canada.
- Aditya Sharma: Prime Minister's Research Fellowship, Cycle – 10, 2023; Ministry of Education, Govt of India.
- Dr. Sushmita Deka: Awarded International Travel Grant by SERB; DST, India.

#### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
1.	Bag, Swarup	IIT Bombay	Associate Professor	Fusion welding processes, Finite element method, Laser micro joining, Heat transfer and fluid flow in fusion welding, Residual stress and distortion, Recrystallization in hot metal forming process, Optimization in manufacturing process
2.	Bandopadhyaya, Dibakar	IIT Kanpur	Associate Professor	Active materials, Artificial muscle materials, Smart structures, Robotics and mechanism, Composites, MEMS, Bio inspired design
3.	Banerjee, Atanu	IIT Kanpur	Associate Professor	Compliant Mechanism, Shape memory alloy, Bio-mimetic devices
4.	Basireddy, Sandeep Reddy	IISc Bangalore	Assistant Professor	Nonlinear Dynamics of Mechanical Systems, Robotics and Control, Nonlinear Control for Underactuated Systems
5.	Basu, Dipankar Narayan	IIT Kharagpur	Associate Professor	Nuclear Thermalhydraulics, Supercritical Natural Circulation Loops, Domestic Air-conditioning, Computational Fluid Dynamics and Heat Transfer
6.	Biswas, Pankaj	IIT Kharagpur	Associate Professor	Manufacturing and Design: Computational weld mechanics, Solid state welding, Soft computing modeling of welding processes, FEM, Line heating
7.	Chakraborty, Debabrata	IIT Kharagpur	Professor	FRP, Composites, FEM, Fracture Mechanics and Design
8.	Dalal, Amaresh	IIT Kanpur	Associate Professor	Computational Fluid Dynamics, Heat Transfer, Structured Grid Techniques in Curvilinear Coordinates, Finite Volume Methods and Unstructured Grid Techniques, Natural and Mixed Convection Flows, Electrochemical Energy Conversion and Storage
9.	Das, Manas	IIT Kanpur	Associate Professor	Advanced Finishing and Nano-finishing Processes, Non-traditional Machining Processes, Machining of Advanced Engineering Materials,

				Micromanufacturing, Micromachining, Tribology, Laser Welding
10.	Dass, Anoop K.	IISc Bangalore	Professor	Computational Fluid Dynamics and Turbomachines
11.	De, Arnab Kumar	IIT Kanpur	Associate Professor	Numerical Methods in Fluid Flow and Heat Transfer, Convection, Turbulence
12.	Dixit, Uday S.	IIT Kanpur	Professor	Design and Manufacturing : FEM, Neural Network and Fuzzy Set Application; Mechatronics
13.	Dwivedy, Santosha K.	IIT Kharagpur	Professor & HOD	Non-linear Dynamics, Design and Robotics, vibrations
14.	Gautam, Sachin S.	IIT Kanpur	Assistant Professor	Design and Manufacturing : Nonlinear Finite Element Analysis, Computational Contact Impact Analysis, Adhesion, Rough Surfaces, Time Integration Schemes, Mixed Time Integration Schemes, Plasticity, Ductile Fracture, Continuum Damage Mechanics
15.	Hazarika, Shyamanta M.	University of Leeds, England	Professor	Robotics, Cognitive Systems, Knowledge Representation and Reasoning
16.	Joshi, Shrikrishna N.	IIT Bombay	Associate Professor	Micro fabrication: Laser micro forming, Micro machining: Micro electric discharge machining (EDM), Web based manufacturing, Process modeling and optimization of advanced manufacturing processes, Application of soft computing techniques in manufacturing
17.	Kakoty, Sashindra K.	IIT Kharagpur	Professor & Dean, Infrastructure, Planning and Management	Tribology, Duct Acoustics, Mechanical System Design, Rural Technology
18.	Kalita, Karuna	University of Nottingham	Associate Professor	Rotordynamics, Coupled Dynamics of Electro-Mechanical Systems, Vibration
19.	Kanagaraj, S.	IIT Kharagpur	Professor	Biomaterials, Carbon nanotubes based nanocomposites, Nanofluids, Materials characterization
20.	Kapil, Sajan	IIT Bombay	Assistant Professor	Rapid Manufacturing (3D Printing), Welding/Cladding Processes, CNC, Manufacturing Automation
21.	Khanikar, Prasenjit	North Carolina State University	Assistant Professor	Microstructural Materials Modeling, Micro-mechanics, Dislocation Density Based Crystal Plasticity, Deformation and Failure Mechanisms of Metallic Materials, Finite Element Method, Dynamic Behavior of Materials, Fracture Mechanics, Aluminum Alloys, Microstructural Characterization
22.	Kulkarni, Vinayak	IISc Bangalore	Associate Professor	High enthalpy flows, scramjet engine, experimental, aerodynamics, measurement science, CFD simulations

23.	Kumar, Bhaskar	IIT Kanpur	Assistant Professor	Hydrodynamic Stability, Bluff Body Flows, Computational Fluid Dynamics
24.	Kumari, Poonam	IIT Delhi	Associate Professor	Theory of plates and shells, Computational mechanics, Smart structures
25.	Madhusudhana, Gavara	IISc Bangalore	Assistant Professor	Computational Fluid Dynamics, Heat Transfer, Cooling of Electronics, Multi-phase flows, Cooling at Micro/Mini scales, Turbulent Fluid Flow and Heat transfer
26.	Mahanta, Pinakeswar	IIT Guwahati	Professor	Thermal Radiation with Participating Media, Fluidization, Energy Conservation and Renewable Energy
27.	Mandal, Shubhadeep	IIT Kharagpur	Assistant Professor	Microswimmers, Complex Fluids, Droplet Microfluidics, Electrohydrodynamics
28.	Mankodi, Tapan Krishnakumar	IIT Bombay	Assistant Professor	Rarefied Gas Dynamics, Computational Gas Dynamics, Hypersonic Aerothermodynamics, Non-equilibrium Flows, Galerkin Methods
29.	Mittal Rinku Kumar	IIT Bombay	Assistant Professor	Machining Dynamics: Chatter Free Machining
30.	Satish Kumar Panda	National University of Singapore (NUS), Singapore	Assistant Professor	Artificial Intelligence in Healthcare, Medical Image Processing, Diagnosis, Ophthalmology, Biomechanics, and Finite Element Analysis
31.	Mondal, Pranab Kumar	IIT Kharagpur	Assistant Professor	Microfluidics, Electrokinetics, Two Phase Transport, Microscale Transport of Heat, Flow Through Porous Media.
32.	Murthy, K. S. R. Krishna	IIT Kharagpur	Professor	Finite Element Methods, Error Estimation and Fracture Mechanics
33.	Muthu, Nelson	IIT Bombay and Monash University	Assistant Professor	Meshfree Methods, FEM, Fracture Mechanics, Composites, Structural Health Monitoring, Medical Device Innovation
34.	Muthukumar, P.	IIT Madras	Professor	Coupled heat and mass transfer analysis; Metal hydride based thermal machines, Conventional and Non-conventional refrigeration systems
35.	Nandy, Arup	IISc Bangalore	Assistant Professor	Finite Element Development and Analysis in Structure, Acoustics, Electromagnetics, Structural acoustic interaction, Magnetohydrodynamics, MEMS; Optimization
36.	Narayanan, Ganesh R.	IIT Bombay	Associate Professor	Material Forming and Joining
37.	Pal, Sukhomay	IIT Kharagpur	Associate Professor	Welding Process Monitoring and Control, Tool Condition Monitoring, Non-Conventional Machining Process Application of Artificial Neural Network,

				Genetic Algorithms and Fuzzy logic in manufacturing
38.	Panda, Biranchi	NTU Singapore	Assistant Professor	Advanced manufacturing and design, 3D/4D printing, Modelling and Characterization, Energy and sustainable environmental technologies
39.	Panda, Satyajit	IIT Kharagpur	Associate Professor	Composite materials, Nonlinear vibrations, Smart materials and structures, FEM, Functionally Graded materials and structures, Micromechanics.
40.	Pandey, Manmohan	IIT Kanpur	Professor	Dynamics and Control of Fluid-Thermal Systems, Nuclear Reactor Thermal-Hydraulics
41.	Robi, P. S.	IIT Bombay	Professor	Coating, Fracture Mechanics, Materials Processing, Metal Matrix composite, Metal Casting, P/M Processing
42.	Saha, Ujjwal K.	IIT Bombay	Professor	Propulsion, Turbomachinery, Wind Energy Conversion, Internal Combustion Engines
43.	Sahasrabudhe, Anil D.	IISc Bangalore	Professor (On deputation as Chairman of the All India Council for Technical Education)	Vibration and Noise, Condition Monitoring, CAD/CAM
44.	Sahoo, Niranjan	IISc Bangalore	Professor	Fluid and Thermal Engineering, Aerodynamics, Gas Dynamics, Instrumentation, Measurements and Experiments in Fluid
45.	Senthilvelan, S.	IIT Madras	Professor	Composites, Fatigue, Wear and Failure Analysis
46.	Soti, Atul	Monash University and IIT Bombay	Assistant Professor	Computational Fluid Dynamics and Heat Transfer, Fluid-Structure Interaction, Renewable energy, High Performance Computing, Immersed-Boundary Method, Spectral-element Method
47.	Sharma, Deepak	IIT Kanpur	Associate Professor	Optimal Design: Modeling and Computation,  Engineering Design and Optimization, Genetic Algorithms, Multi-objective Optimization
48.	Tarkesh Dora Pallicity	IIT Madras	Assistant Professor	Continuum Mechanics of Solids and Fluids, Multiphysics and Multi-Scale Modeling and Simulation
49.	Tiwari, Rajiv	IIT Kanpur	Professor	Rotor Dynamics, Vibrations, Identification in

				Mechanical Systems, Rolling Element Bearing Design and Analysis, Application of Active Magnetic Bearings in Rotors, Vibrations based Condition Monitoring of Industrial Rotating Machines
50.	Ujendra Kumar Komal	IIT Roorkee	Assistant Professor	Additive Manufacturing of Polymer Composites, Bio-Composites, Natural Fibers

# Physics

**YEAR OF ESTABLISHMENT OF THE DEPARTMENT:** 1995.

**ACADEMIC PROGRAMMES OFFERED:** B. Tech. (Engineering Physics), M. Sc. (Physics) and Ph. D. (Physics).

### **LABORATORY FACILITIES**

- a) Teaching Labs: (05 teaching laboratories)
  - i. Advanced Physics Lab-01
  - ii. B. Tech 1<sup>st</sup> year Lab-01
  - iii. Electronics Lab-01
  - iv. General Physics Lab-01
  - v. Numerical Lab-01
- b) Research labs: (24 research laboratories)
  - i. Advanced Nanomaterials Lab (Involved in cutting-edge research on developing advanced nanomaterials and exploring their practical applications in energy conversion and storage).
  - ii. Cold and Ultra-Cold Atomic Physics Lab
  - iii. Computational Lab
  - iv. Computer-Generated Holography and Optical Imaging Lab
  - v. Electro-ceramics Lab
  - vi. Fiber Optics Lab
  - vii. Furnace Lab
  - viii. High Energy Physics Lab
  - ix. Laser and Photonics Lab
  - x. Low-Temperature Physics Lab
  - xi. Magnetism Lab
  - xii. Materials Science Lab
  - xiii. Nonlinear Optics Lab
  - xiv. Physical Property Measurement System Lab
  - xv. Semiconductor Labs (02)
  - xvi. Semiconductor Nanostructure and vacuum Lab
  - xvii. Spectroscopy Lab
  - xviii. Terahertz Photonics and Plasmonics Lab
  - xix. Thin Film Physics Lab
  - xx. XRD Lab
  - xxi. Integrated Quantum Photonics Lab
  - xxii. Advanced Materials Photonics Lab
  - xxiii. Quantum Materials Lab
  - xxiv. Spintronics Lab

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

- Bipolar magnet power supply,  $\pm 135\text{A}$ ,  $\pm 76\text{V}$ ; Model No: 648, Lake Shore Cryotronics, Westerville, OH 43082, United States (Price: USD 43,742.00).
- Optical Microscope (Make: Magnus).
- PACU – Pure Air Circulator Unit.
- Batop Bow-tie Photoconductive Antenna.

## MAJOR AREAS OF RESEARCH AND DEVELOPMENT

The major research focus of the department is evenly poised between different branches of theoretical and experimental Physics. The thrust areas are:

### (i) Condensed Matter Physics (Experiment and Theory)

- Amorphous and nanocrystalline magnetic materials.
- Amorphous and nanocrystalline semiconductors, Thin film and Hetero-junction solar cells, Perovskite solar cells, Graphene, Transition metal dichalcogenides and transition metal oxides, 2D materials.
- Atomistic Modeling of Materials for Energy and Environmental Applications.
- Biophysics and Biomaterials.
- Bioimaging.
- Bosonization.
- Cutting-edge research on the development of advanced nanomaterials and explore their practical application in the area of energy conversion and storage.
- Development of linear giant magnetoresistance devices for magnetic sensors.
- Development of triboelectric and piezoelectric and hybrid nanogenerators for energy harvesting.
- DFT.
- Electronic transport and Fermi surface properties.
- Energy conversion and storage.
- Epitaxial thin films.
- Hybrid nanomaterials for energy and environmental applications.
- Low-dimensional Van der Waals systems.
- Magnetic alloys and thin films for spintronics.
- Magnetization switching.
- Microwave and piezoelectric bulk and thin films.
- Multilayer structured thin films.
- Nanostructured and Nanogranular magnetic materials.
- Nanowires.
- Non-collinear spin textures.
- Optoelectronics.
- Perovskites.
- Photophysics.
- Photo-emission spectroscopy.
- Polymer nanocomposites.
- Quantum Materials.
- Semiconductors.
- Single crystals.
- Solar Photovoltaics.
- Spintronics devices.
- Spin orbit torque.
- Superconducting spintronics.
- Topological materials.
- Transition Metal oxide system.



**(ii) Laser and Photonics (Theory and Experiments)**

- AI assisted meta-design.
- Color Centers in diamond.
- 2D materials and Heterostructures.
- Fiber & Integrated Optics, Photonic Crystal Fiber and applications, Localized Surface Plasmon Resonance based Sensors, Fiber Bragg Gratings and based Devices, Fiber Optic Sensor, Bio/Nano-Photonics, Graphene immobilized Optical Fiber Sensors.
- Integrated photonics.
- Lab-on-a-chip photonic and microfluidics.
- Laser cooling and trapping of atoms.
- Laser Physics and Spectroscopy, Laser produced plasmas.
- Laser micromachining.
- Nanophotonics.
- Nonlinear optics.
- Optical Switching.
- Optical components in C-band.
- Programmable Diffractive Optics, Confocal Microscopy.
- Quantum emitters in hBN.
- Quantum Optics.
- Quantum optoelectronics.
- Terahertz plasmonics and metamaterials.
- Topological terahertz photonics.
- Ultrafast optics, Terahertz Plasmonics and metamaterials.

**(iii) High Energy Physics (Theory and Experiment)**

- Collider Phenomenology: Dark matter studies, Supersymmetric models, Higgs Physics and Top quark Physics, Higher order QCD corrections, Flavour Physics and CP violation.
- Cosmology and Astroparticle Physics: Inflationary models, Leptogenesis and Baryogenesis, Darkmatter studies, Supernovae neutrinos.
- Experimental High Energy Physics: B-Physics, Neutrino Physics, ILC R&D.
- Low energy QCD, Effective Field Theory.

**(iv) Gravity, Astrophysics and Cosmology**

- Astrophysical flows around compact objects, Ultra high energy cosmic rays, Black hole perturbations, Gravitational waves Cosmology, Ads/CMT.
- General theory of relativity, Field theory on curved space times, Black holes.

**(v) Quantum Optics and Quantum Technology**

- The group focuses on a multitude of frontier areas, covering both fundamental and applied aspects of quantum optics.
- The current interests of the research group are coherent control of atom-light interaction, cavity quantum optomechanics, circuit quantum electrodynamics, quantum entanglement, quantum synchronization, quantum metrology, quantum communication, and artificially developing models for quantum many body physics using ultracold atoms.

**MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT**

- Synthesis of highly stable luminescent metal halide perovskite nanocrystals for Hg-ion detection inside the live cells.
- First detection of X-ray polarization in thermal state of LMC X-3: Spectro-polarimetric study with IXPE.

#### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
1.	Dr. Sayan Kumar Chakrabarti	Online Workshop On Numerical and Analytical Relativity (NAR-2024)	IIT Allahabad	20-22/03/2024	National
2.	Dr. Saikat Bhaumik	International Conference on Functional Materials and Polymer Technology (ICFMPT-2024)	ICT-IOC Bhubaneswar & IOP Bhubaneswar	14-16/03/ 2024	International
3.	Dr. Bibhas Ranjan Majhi	Workshop: Gravity, Cosmology and Raychaudhuri's equation	Jadavpur University, Kolkata	13-14/03/2024	National
4.	Prof. Dobbidi Pamu	International Conference on River Corridor Research and Management (RCRM-2024)	IIT Guwahati, India	07-09/03/2024	International
5.	Prof. Bipul Bhuyan	International Conference on Frontiers in Pure and Applied Physics (ICFPAP 2024)	USTM, Meghalaya	29/02/2024	International
6.	Prof. Pratima Agarwal	International Conference on advanced functional materials and devices (AFMD-2024)	SRM Institute of Science and Technology, Chennai	26-29/02/ 2024	International
7.	Prof. Santabrata Das	Exploring the Universe: from Near to Far	Indian Centre for Space Physics, Kolkata	16-21/02/2024	National
8.	Prof. Dobbidi Pamu	Workshop on Neutron Scattering (Elastic and Inelastic) and Muon Spectroscopy	IIT Guwahati, India	16-17/02/ 2024	National
9.	Dr. Pankaj K. Mishra	Workshop on Neutron Scattering (Elastic and Inelastic) and Muon Spectroscopy	IIT Guwahati, India	16-17/02/2024	National
10.	Dr. Malleswararao Tangi	Workshop on Neutron Scattering (Elastic and Inelastic) and Muon Spectroscopy	IIT Guwahati, India	16-17/02/2024	National
11.	Dr. Binoy K. Hazra	Workshop on Neutron Scattering (Elastic and Inelastic) and Muon Spectroscopy	IIT Guwahati, India	16-17/02/2024	National
12.	Prof. P. K. Giri	Conference on Recent Trends in Condensed Matter Physics Related to Quantum Materials	IACS, Kolkata	15-16/02/2024	National

13.	Prof. Subhash Thota	Conference on Recent trends in condensed matter physics related to quantum materials	IACS, Kolkata	15-16/02/2024	National
14.	Prof. Poulose Poulose	Frontier topics in Collider Physics	IISER Pune	14-17/02/2024	National
15.	Prof. P. K. Giri	National Physicists' Conclave 2024 (NPC 2024)	SRM Institute of Science & Technology, Chennai, India	07-10/02/2024	National
16.	Prof. Subhash Thota	National Physicists' Conclave 2024 (NPC 2024)	SRM Institute of Science & Technology, Chennai, India	07-10/02/2024	National
17.	Prof. Pratima Agarwal	International Conference Materials Science (ICMS 2024)	Tripura University	31/01/2024-02/02/2024	International
18.	Prof. Subhash Thota	The annual technical festival TECHNOZION-23	NIT Warangal	19-21/01/2024	National
19.	Prof. Poulose Poulose	Workshop on High Energy Physics Phenomenology (WHEPP-XVII)	IIT Gandhinagar, Gujarat	02-11/01/2024	International
20.	Dr. Subhaditya Bhattacharya	Workshop on High Energy Physics Phenomenology (WHEPP-XVII)	IIT Gandhinagar, Gujarat	02-11/01/2024	International
21.	Dr. Soumitra Nandi	Workshop on High Energy Physics Phenomenology (WHEPP-XVII)	IIT Gandhinagar, Gujarat	02-11/01/2024	International
22.	Dr. Kumar Meduri Chakravartula	Workshop on High Energy Physics Phenomenology (WHEPP-XVII)	IIT Gandhinagar, Gujarat	02-11/01/2024	International
23.	Prof. Arunansu Sil	Workshop on High Energy Physics Phenomenology (WHEPP-XVII)	IIT Gandhinagar, Gujrat	02-11/01/2024	International
24.	Prof. Perumal Alagarsamy	Synthesis of Nanoparticles and their Applications (WSNA 2023)	Guwahati	26-30/12/2023	National
25.	Dr. Pankaj K. Mishra	Field Theory and Turbulence	ICTS, TIFR, Bangalore	18-22/12/2023	International
26.	Prof. P. K. Giri	7 <sup>th</sup> International Conference on Electronics, Materials Engineering and Nano-Technology (IEMENTech 2023)	IEM, Kolkata	18-20/12/2023	International
27.	Prof. Subhash Thota	7 <sup>th</sup> International Conference on Electronics, Materials Engineering and Nano-Technology (IEMENTech 2023)	IEM, Kolkata	18-20/12/2023	International
28.	Prof. Subhash Thota	34 <sup>th</sup> Annual General Meeting of MRSI & 5 <sup>th</sup> Indian Materials conclave from	IIT (BHU), Varanasi	12-15/12/2023	National

29.	Prof. Subhradip Ghosh	Emerging Phenomena in Quantum Materials	Bharatpur, Rajasthan	11-15/12/2023	International
30.	Prof. Santabrata Das	10 <sup>th</sup> International Conference on Gravitation and Cosmology: New Horizons and Singularities (ICGC-2023)	IIT Guwahati, India	06-09/12/2023	International
31.	Dr. Debaprasad Maity	10 <sup>th</sup> International Conference on Gravitation and Cosmology: New Horizons and Singularities (ICGC-2023)	IIT Guwahati, India	06-09/12/2023	International
32.	Dr. Sayan Kumar Chakrabarti	10 <sup>th</sup> International Conference on Gravitation and Cosmology: New Horizons and Singularities (ICGC-2023)	IIT Guwahati, India	06-09/12/2023	International
33.	Prof. Perumal Alagarsamy	International Conference on Magnetic Materials and Applications (ICMAGMA-2023)	Hyderabad, India	04-06/12/2023	International
34.	Prof. Dobbidi Pamu	International Conference on Magnetic Materials and Applications (ICMAGMA-2023)	Hyderabad, India	04-06/12/2023	International
35.	Dr. Binoy K. Hazra	International Conference on Magnetic Materials and Applications (ICMAGMA-2023)	Hyderabad, India	04-06/12/2023	International
36.	Dr. Soumitra Nandi	16 <sup>th</sup> International Conference on Heavy Quarks and Leptons (HQL2023)	Tata Institute of Fundamental research (TIFR), Mumbai	28/11/2023-02/12/2023	International
37.	Prof. Saurabh Basu	Quantum Matter (QMAT 2024)	NISER Bhubaneswar	27-30/11/2023	National
38.	Prof. Dobbidi Pamu	Emerging Trends in Vacuum Electronic Devices and Applications	Rajahmundry, India	23-25/11/2023	National
39.	Prof. Perumal Alagarsamy	The 9 <sup>th</sup> Southeast Asia Collaborative Symposium on Energy Materials (SACSEM)	Indonesia	20-22/11/2023	International
40.	Prof. Santabrata Das	North-East Meet of Astronomers (NEMA-IX)	Mizoram University	20-22/11/2023	National
41.	Prof. Santabrata Das	Advances in Relativistic Astrophysics	ARIES, Nainital	02-04/11/2023	National
42.	Prof. Subhash Thota	German Electron Synchrotron Radiation Beamline DESY, PETRA-III	Hamburg, Germany	01-06/11/2023	International

43.	Dr. Debaprasad Maity	Astro Particle Symposium, Paris 2023	Paris	26/10/2023	International
44.	Prof. Bipul Bhuyan	India-JINR Workshop on Elementary Particle and Nuclear Physics, and Condensed Matter Research JINR, Russia	JINR, Russia	16-19/10/2023	International
45.	Prof. P. K. Giri	International conference on Advanced Materials for Better Tomorrow (AMBT 2023)	BHU, Varanasi	10-13/10/2023	International
46.	Prof. Subhash Thota	International conference on Advanced Materials for Better Tomorrow (AMBT 2023)	BHU, Varanasi	10-13/10/2023	International
47.	Prof. Padma Kumar Padmanabhan	6 <sup>th</sup> International Conference on Molecular Simulation (ICMS2023)	Taipei, Taiwan	06-09/10/ 2023	International
48.	Prof. Subhash Thota	The 6 <sup>th</sup> International Conference on Energy Materials and Nanotechnology, the Sino-German Bilateral Workshop on Energy-Saving Coatings and the Wuhan Forum of World-Famous Scientists' Lecturing in Hubei on Environmental Detection and Sensing	Wuhan, Hubei, China	22-24/09/2023	International
49.	Prof. Subhash Thota	French national synchrotron facility SOLEIL, Crystal Beamline	Saint-Aubin, Saclay, France	19-25/09/2023	International
50.	Dr. Debasish Borah	Scalars 2023	University of Warsaw, Poland	13-16/09/2023	International
51.	Dr. Subhaditya Bhattacharya	Scalars 2023	University of Warsaw, Poland	13-16/09/2023	International
52.	Dr. Pankaj K. Mishra	STATPHYS 28	University of Tokyo, Japan	07-11/08/2023	International
53.	Prof. Subhradip Ghosh	New Approaches and Machine Learning Methods for Ab Initio Calculations	Bangalore, Karnataka	26-28/07/2023	National
54.	Prof. Arunansu Sil	SCALARS 2023	University of Warsaw, Poland	13-16/07/2023	International
55.	Prof. P. K. Giri	Conference on Emerging Materials 2023	IISER Pune	13-15/07/ 2023	International
56.	Prof. Subhash Thota	Conference on Emerging Materials 2023	IISER Pune	13-15/07/ 2023	International
57.	Dr. Debasish Borah	The Dark Side of the Universe	ICTP-EAIFR, Kigali, Rwanda	10-14/07/2023	International

58.	Prof. Amarendra Kumar Sarma	International Conference on Photonics	IISc Bangalore	05/07/2023	International
59.	Prof. Amarendra Kumar Sarma	One day Workshop on Quantum Technology	Online	20/06/2023	National
60.	Prof. Poulose Poulose	CAP Congress 2024	University of New Brunswick, Fredericton, Canada	18-23/06/2023	International
61.	Prof. Subhradip Ghosh	International Workshop on Computational Nanotechnology	Barcelona, Spain	12-16/06/2023	International
62.	Prof. Subhradip Ghosh	International Conference on Recent Advances in Energy Materials and Applications	Aizawl, Mizoram	29-31/05/2023	International
63.	Prof. Subhash Thota	25 <sup>th</sup> International Conference on the Jahn-Teller Effect Vibronic Coupling and Jahn-Teller Effects in Polyatomic Systems Novel Achievements and Applications	University of York, Toronto, Ontario (Canada)	14-18/05/2023	International
64.	Prof. Dobbidi Pamu	Vacuum Electronics Conference (IVEC-2023)	Chengdu, China	26-28/04/2023	International
65.	Prof. Santabrata Das	Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO-V)	Kodaikanal Solar Observatory, Tamil Nadu	03-05/04/2023	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl.No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1.	Prof. S. Ravi	Magnetic and Dielectric perspective of Advanced Functional Materials: Garnets and Double Perovskites	International Conference on Emerging Advanced Materials [ICEAM- 2024]	Centre for Nanoscience and Technology (CNST) Anna University, Chennai-25	27-28/03/2024
2.	Prof. Pratima Agarwal	Prospects of R&D in Semiconductor materials & devices design, fabrication and Testing” (Keynote Lecture) @ Industry-Academia Workshop on Analytical Instruments and Material Characterization	Institute of Science and Technology Gauhati University (GUIST)	Guwahati	18/03/2024
3.	Prof. Arunansu Sil	3 lectures on ‘Leptogenesis and Baryogenesis’	SANGAM @ HRI, Allahabad, India	HRI, Allahabad, India	14-15/03/2024

4.	Dr. Debaprasad Maity	Gravitational Waves: Theory and Observations	Department of Physics, ICFAI University Tripura	ICFAI University Tripura	14/03/2024
5.	Prof. Gagan Kumar	Terahertz Photonics: Engineering Metasurfaces for Next Generation broadband Devices	Guru Jambheshwar University of Science and Technology, Hisar	Hisar, Haryana	13/03/2024
6.	Dr. Debasish Borah	Asymmetric dark matter	Sangam 2024	HRI Prayagraj	12/03/2024
7.	Prof. Gagan Kumar	Broadband Terahertz Metasurfaces - Design Challenges and Applications in Next-Generation Photonics	IIT Bombay	Bombay	10/03/2024
8.	Dr. Debasish Borah	Where did the antimatter of the Universe go?	SYMPHY 2024	IIT Bombay	08-10/03/2024
9.	Prof. Bipul Bhuyan	Neutrino Physics: Current Experimental Status and Future Prospects	International Conference on Frontiers in Pure and Applied Physics (ICFPAP 2024)	USTM, Meghalaya	29/02/2024
10.	Prof. Subhradip Ghosh	Harnessing Energy in Computers	IIT Guwahati	Guwahati	28/02/2024
11.	Prof. Pratima Agarwal	Dopant free c-Si heterojunction solar cells: Prospective and Challenge (Keynote lecture)	SRM Institute of Science and Technology	Chennai	26/02/2024
12.	Prof. Gagan Kumar	Broadband Terahertz Metasurfaces	JIIT Noida	Noida, U.P.	24/02/2024
13.	Dr. Uday Narayan Maiti	Crystallization selective growth of metallic nanoclusters on graphitic layers for efficient water splitting	SRM University, in association with Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, National Chemical Laboratory, Pune, Virginia Commonwealth University USA, IIT Madras, IIT Bombay	Amaravati, Andhra Pradesh	24/02/2024
14.	Prof. S. Ravi	Multiferroicity and magnetization reversal in rare earth garnet samples	National Conference on Materials Science and Technology (NCMST 2024)	St. Thomas College, Pala, Kerala	21-23/02/2024
15.	Prof. Santabrata Das	Role of pseudo-potentials in studying relativistic hot accretion flow around rotating black holes	Indian Centre for Space Physics	Kolkata	16-21/02/2024
16.	Dr. Pankaj K. Mishra	A basic introduction to the density functional theory	INUP-i2i Online Familiarization Workshop on "Nano Sensors and	Guwahati	16/02/2024

			Optoelectronic Devices” IIT Guwahati		
17.	Dr. Malleswararao Tangi	Group III nitrides and Optoelectronics Devices	Indian Nanoelectronics Users' Programme INUP-i2i 2024	Centre for nanotechnology, IIT Guwahati	16/02/2024
18.	Prof. Subhash Thota	Unique Magnetic Ordering in Orbitally Frustrated Spin $\frac{1}{2}$ Kagome Spinels and Ising-Chain Colombites	Department of Physics and Nanotechnology, SRM IST	SRM, Chennai, India	10/02/2024
19.	Prof. Pratima Agarwal	Progress in c-Si based Heterojunction solar cells	Tripura University	Agartala	01/02/2024
20.	Prof. Bosanta R Boruah	Implementation of low cost easySTORM based super-resolution imaging at IITG	IISER Mohali	IISER Mohali	29/01/2024
21.	Dr. Subhaditya Bhattacharya	Connecting dark matter to neutrinos, ICFPNAP	Don Bosco University	Assam	24/01/2024
22.	Dr. Debasish Borah	Leptogenesis from dark matter	ICFPNAP 2024	Assam Don Bosco University, Guwahati	23-24/01/2024
23.	Prof. Subhash Thota	Spintronics and Quantum Critical Excitations: Fundamentals to Applications	Department of Physics National Institute of technology Warangal	Warangal Telangana, India	20/01/2024
24.	Dr. Kumar Meduri Chakravartula	Jet Production at the LHC	NISER Bhubaneswar	Bhubaneswar, Odisha	15/01/2024
25.	Dr. Subhaditya Bhattacharya	Searches for light and heavy dark matters, WHEPP (WG1) 2024	IIT Gandhinagar	Gujrat	06/01/2024
26.	Dr. Subhaditya Bhattacharya	Connecting dark matter to neutrinos, WHEPP (WG3) 2024	IIT Gandhinagar	Gujrat	05/01/2024
27.	Dr. Debasish Borah	Some new avenues of probing leptogenesis	WHEPP 2024	IIT Gandhinagar	02-11/01/2024
28.	Prof. Perumal Alagarsamy	Let us walk the e-Walk to harvest abundant energy for charging low-power electronics.	Handique Girls' College	Guwahati	26-30/12/2023
29.	Prof. Amarendra Kumar Sarma	Sequential Quantum transduction process of a superconducting qubit in hybrid electro-opto-magnonical system	IISER Mohali	Chandigarh	22/12/2023
30.	Dr. Pankaj K. Mishra	Energy spectra and fluxes of turbulent rotating Bose-Einstein condensates in two dimensions	ICTS, TIFR, Bangalore	Bangalore	21/12/2023
31.	Prof. Alika Khare	Versatility of Pulsed Laser Ablation at Solid-Liquid Interface for Synthesis of	Delhi Technology University, Delhi	Delhi	20-22/12/2023



		Nanoparticles & Some of the Applications			
32.	Prof. Gagan Kumar	Toroidal Terahertz Meta Devices	Amity University	Noida, U.P.	20/12/2023
33.	Prof. Subhradip Ghosh	Chemical and Magnetic Disorder as Routes to Manipulate Pseudocapacitive Storage in MXene Supercapacitor Electrodes	University of Pune & Uppsala University	Bharatpur, Rajasthan	12/12/2023
34.	Prof. Subhash Thota	Intriguing Magnetic Behavior of few Frustrated Kagomé Antiferromagnets and Ising-Chain Columbites	School of Materials Science and Technology, IIT BHU	Varanasi, UP, India	12/12/2023
35.	Prof. Bosanta R Boruah	Holographic generation of complex light beams for communication and metrological applications	XLVI OSI Symposium OPTIQ-2023 International Conference on Optics, Photonics and Quantum Information	CUSAT, Kerala	11-13/12/2023
36.	Dr. Binoy K. Hazra	Current induced magnetization switching of a non-collinear antiferromagnet	Centre for Nanotechnology, IIT Guwahati	IIT Guwahati, India	08/12/2023
37.	Prof. Gagan Kumar	Terahertz Photonics	IIT Guwahati	Guwahati	06/12/2023
38.	Dr. Ratnadwip Singha	Using crystallographic motifs to search for new quantum materials	INUP-i2i Familiarization Workshop on Quantum Materials and Nano Devices	IIT Guwahati	06/12/2023
39.	Prof. Perumal Alagarsamy	Tunable entropy stabilized systems: Ambient synthesis, phase stability, and harnessing chemical disorder for energy harvesting and future magnetoelectronic applications	International Conference on Magnetic Materials and Applications (ICMAGMA-2023)	Hyderabad, India	04-06/12/2023
40.	Dr. Binoy K. Hazra	Seeded Spin-Orbit Torque-induced magnetization switching of a thick non-collinear antiferromagnet	Magnetics Society of India (MSI)	Hyderabad, India	04-06/12/2023
41.	Prof. Gagan Kumar	Terahertz Photonics	IIT Guwahati	Guwahati	01/12/2023
42.	Dr. Soumitra Nandi	Theory Overview of rare decays	TIFR, Mumbai	Mumbai	01/12/2023
43.	Dr. Pankaj K. Mishra	Motion and Gravity	Teachers training Program, IIT Guwahati	Guwahati	30/11/2023-04/12/2023
44.	Prof. Perumal Alagarsamy	Let us e-Walk for harvesting abundant energy from biomechanical activities	NIT Mizoram, Mizoram	Online (NIT Mizoram)	30/11/2023
45.	Prof. Saurabh Basu	Floquet dynamics of Kitaev chains	NISER Bhubaneswar	Bhubaneswar	28/11/2023

46.	Prof. Subhradip Ghosh	Understanding the effects of doping and substitution on capacitances of $Ti_3C_2T_x$ MXene Supercapacitor Electrodes: Modeling and Simulation from First-principles	Indian Association for Cultivation of Science	Kolkata	28/11/2023
47.	Prof. Gagan Kumar	Terahertz Plasmonics	CSIR-National Physical Laboratory	New Delhi	26/11/2023
48.	Prof. Bosanta R Boruah	Beam manipulation and force estimation in a dynamic holographic optical tweezers	International Conference on Trends in Optics and Photonics	Calcutta University	24-25/11/2023
49.	Prof. Perumal Alagarsamy	Mechanochemical synthesis of ferromagnetic nanocomposites and the exploration towards energy harvesting from biomechanical activities	Institut Teknologi Bandung, Indonesia	Indonesia	20-22/11/2023
50.	Prof. Santabrata Das	Massloss from relativistic magnetized accretion flow around black holes	Mizoram University	Mizoram	20-22/11/2023
51.	Prof. Subhradip Ghosh	Modeling Energy Storage Capacity in a Supercapacitor	Don Bosco University	Sonapur, Assam	03/11/2023
52.	Dr. Debasish Borah	Neutrinos at the crossroad of particle physics, astrophysics and cosmology	Himachal Pradesh Central University	Online	31/10/2023
53.	Dr. Debaprasad Maity	Gravitational Neutrino Reheating	Institut Pascal, Saclay, Paris	Institut Pascal, Paris	26/10/2023
54.	Prof. Bipul Bhuyan	Deep Underground Neutrino Experiment: Possible Indian Collaboration with JINR on Detector Development	India-JINR Workshop on Elementary Particle and Nuclear Physics, and Condensed Matter Research	JINR, Russia	16-19/10/2023
55.	Prof. Ashwini Kumar Sharma	Epsilon-near-zero plasmon resonance in ITO	Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat	Online	29/09/2023
56.	Prof. Subhash Thota	Spin caloritronics of Manganite Superlattices for Energy Harvesting	Sirui Hall, School of Materials Science and Engineering Hubei University	Hubei University, China	24/09/2023
57.	Dr. Debaprasad Maity	Many faces of reheating and their signatures on primordial gravitational waves	IIT Madras	Madras	21/09/2023
58.	Dr. Debasish Borah	Baryon Asymmetry from Dark Matter Decay	MTTD 2023	Ustron, Poland	17-22/09/2023
59.	Dr. Subhaditya Bhattacharya	Distinguishing dark matter components at collider	University of Warsaw	Poland	15/09/2023
60.	Dr. Subhaditya Bhattacharya	Shedding light on dark matter	North Lakhimpur College	Assam	13/08/2023
61.	Dr. Pankaj K. Mishra	Structure, dynamics and stability of quantum droplet in	University of Tokyo, Japan	Tokyo	11/08/2023

		spin-orbit coupled Bose-Einstein condensate			
62.	Prof. Subhradip Ghosh	Computational modeling of electrochemical capacitance of Nitrogen doped $Ti_3C_2T_x$ supercapacitor electrode in acidic electrolyte	JNCASR	Bangalore	26/07/2023
63.	Prof. Arunansu Sil	Imprint of Neutrino Seesaw on FIMP Dark Matter and Baryon Asymmetry	MTTD 2023 organised by University of Silesia, Poland	Ustron, Poland	20/07/2023
64.	Prof. Gagan Kumar	Toroidal Resonances in Terahertz Metasurfaces	Indian Institute of Science, Bengaluru	Bengaluru	06/07/2023
65.	Prof. Amarendra Kumar Sarma	Quantum transduction of superconducting qubit in hybrid optomechanical system	IISc Bangalore	Bangalore	05/07/2023
66.	Prof. Subhash Thota	Probing the Quantum Spin Liquid State in Frustrated Kagome-Lattice and Pyrochlore Spinels	CNRS Laboratory CRISMAT	Caen, France	22/06/2023
67.	Prof. Amarendra Kumar Sarma	Hybrid Electro-Optomechanical Systems as a Platform for Quantum Technology	BITS Pilani	Online	20/06/2023
68.	Prof. Subhash Thota	Tricritical Point in H-T Phase diagram of Ising-Chain Columbites	The École nationale supérieure d'ingénieurs de Caen & Centre de Recherche (ENSICAEN)	Caen, France	12/06/2023
69.	Prof. Subhradip Ghosh	Understanding Energy Materials by Harnessing Computer's Energy	Pachhunga University College	Aizawl	30/05/2023
70.	Prof. S. Ravi	Complex Magnetic Properties in Frustrated Double Perovskite $Ho_2CoMnO_6$ Nanorod	International Hybrid Conference on Nano Structured Materials and Polymers (ICNP 2023)	Mahatma Gandhi University, Kottayam, Kerala	12-14/05/2023
71.	Prof. Ashwini Kumar Sharma	Laser-Matter Interaction	IEEE Symposium on Frontiers in Optics and Terahertz Photonics (FiOTP)	IIT Guwahati	12/05/2023
72.	Prof. Gagan Kumar	Terahertz Metamaterials	IIT Guwahati	Guwahati	12/05/2023
73.	Prof. Gagan Kumar	Terahertz Photonics	DAV University	Jalandhar, Punjab	01/05/2023
74.	Dr. Uday Narayan Maiti	Basics of Transmission electron microscopy and scanning electron microscopy and their applications	Centre for Nanotechnology, IIT Guwahati	Guwahati, Assam	27/04/2023
75.	Prof. Gagan Kumar	Terahertz plasmonics	Mahindra University, Hyderabad	Hyderabad	21/04/2023
76.	Prof. Gagan Kumar	Metamaterials for terahertz photonics	Jaypee Institute of Information	Noida, U.P.	12/04/2023

			Technology, Noida, UP		
77.	Prof. Santabrata Das	On the origin of core radio emissions from black hole sources in the realm of relativistic shocked accretion flow	Kodaikanal Solar Observatory	Tamil Nadu	03-05/04/2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
1.	Dr. Bipin Kumar Gupta	CSIR-National Physical Laboratory, New Delhi	2D Quantum Materials: A new approach beyond nanomaterials for Terahertz applications	16/03/2024	Guest talk in IEEE Photonics Society, IIT Guwahati Student Chapter
2.	Prof. Alex Hansen	Norwegian University of Science and Technology, Norway	Porous and granular matter: so common, so unknown	28/02/2024	Guest talk in the celebration of National Science Day, 2024
3.	Dr. Gregor Bayer	Institute for Quantum Optics, Ulm University, Germany	Past, Present and Future of Quantum Technologies	28/02/2024	Guest talk in the celebration of National Science Day, 2024
4.	Dr. Drona Vatsyayan	IFIC, University of Valencia	Asymmetries in Dark Sectors	16/02/2024	Weekly seminar talk in the department
5.	Prof. Janusz Gluza	University of Silesia, Katowice, Poland	Precision physics at high energy colliders and low energy connections	07/02/2024	Weekly seminar talk in the department
6.	Dr. Partha Nandi	University of Stellenbosch, South Africa	Gravitational waves and Berry phase	09/01/2024	-
7.	Prof. Luciano Rezzolla	Institute of Theoretical Physics, Goethe University Frankfurt	M87* and Sgr A*: Imaging supermassive black holes	05/12/2023	Hosted by Prof.

					Santabrata Das
8.	Prof. Alakabha Datta	University of Mississippi	A sterile neutrino solution to the B and the MiniBooNE anomalies	22/11/2023	Weekly seminar talk in the department
9.	Prof. Biman Nath	RRI, India	Institute Lecture Series: The First Starts in the Universe	16/10/2023	Hosted by Prof. Santabrata Das
10.	Dr. Sujoy Kumar Modak	University of Colima, Mexico	Revisiting the enigmatic early universe with T-vacuum state	04/08/2023	Weekly seminar talk in the department
11.	Dr. Amit Adhikary	University of Warsaw, Poland	Higgs boson searches in SM and BSM	17/07/2023	Weekly seminar talk in the department

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1.	Dr. Kanhaiya Pandey (Convener), Dr. Vibhav Bharadwaj & Dr. Ratnadwip Singha (Organizing committee member)	Celebration of National Science Day, 2024	IIT Guwahati	28/02/2024	National	~200
2.	Prof. Subhash Thota (Convener) <b>Workshop</b> <b>Coordinators:</b> Prof. Dilip Pal, Dr. Pankaj Kumar Mishra, Dr. Saikat Bhaumik, Dr. Binoy Krishna Hazra, Dr. Vibhav Bharadwaj Shivakumar, Dr. Ratnadwip Singha, Dr. Rishi Maiti & Dr. Malleswararao Tangi	Workshop on Neutron Scattering (Elastic and Inelastic) and Muon Spectroscopy	Nanomission DST and JNCASR Bangalore	16-17/02/2024	National	120
3.	Prof. D. Pamu	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	MeitY, GoI	14-16/02/2024	National	514

4.	Dr. Kumar Meduri Chakravartula (Coordinator for the Working Group -1)	Workshop on High Energy Physics Phenomenology WHEPP-XVII	DAE/BRNS	02-11/01/2024	International	40 in WG-1
5.	Prof. Santabrata Das (Chair), Dr. Subhaditya Bhattacharya, Dr. Debasish Borah, Dr. Sayan Kumar Chakrabarti, Dr. Sovan Chakraborty, Dr. Debaprasad Maity, Dr. Bibhas Ranjan Majhi, Dr. Malay Kumar Nandi & Prof. Arunansu Sil	10 <sup>th</sup> International Conference of Gravitation and Cosmology (ICGC 2023)	SERB, RRI, IUCAA, IAGRG, IISER Kolkata	06-09/12/2023	International	300
6.	Prof. D. Pamu	INUP-i2i Online Familiarization Workshop on Nano and Quantum Materials & Devices: Fabrication and Characterization	MeitY, GoI	06-08/12/2023	National	372
7.	Prof. D. Pamu	INUP-i2i Hands-on Training on Fabrication and Characterization of Nanoelectronic Devices	MeitY, GoI	02-11/06/2023	National	36
8.	Prof. Gagan Kumar	Frontier in Optics and Terahertz Photonics 2023	IEEE	12/05/2023	National	48
9.	Prof. D. Pamu	INUP-i2i Offline Familiarization Workshop on Nanoelectronics: Fabrication and Characterization	MeitY, GoI	25-27/04/2023	National	53
10.	Prof. Santabrata Das (Co-organizer)	Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO-V)	Indian Institute of Astrophysics, Bangalore	03-05/04/2023	National	120 (Held at Kodaikanal, Tamil Nadu)

## AWARDS AND HONOURS

- Prof. P. K. Giri: Senior Member; IEEE, USA.
- Prof. P. K. Giri: National Scholarship; National Scholarship Programme of the Slovak Republic.
- Prof. Subhash Thota: Editorial Advisory Board Member; American Institute of Physics (AIP), USA.
- Prof. Subhash Thota: DST Nanomission funding; Rutherford Appleton Laboratory ISIS Neutron and Muon Source.
- Prof. Subhash Thota: DST Nanomission-RAL funding; Deutsches Elektronen-Synchrotron DESY.
- Dr. Ratnadwip Singha: INSPIRE faculty fellowship; Department of Science and Technology.
- Dr. Binoy K. Hazra: INSPIRE Faculty Fellowship; Department of Science and Technology (DST).
- Dr. Binoy K. Hazra: Life Membership; Magnetics Society of India (MSI).
- Dr. Saikat Bhaumik: Life Membership; Magnetics Society of India (MSI).

## STUDENTS' ACHIEVEMENTS

- Mr. Sunil Kumar Moharana: Best Poster Award; National Conference on Chemical Physics (NCCP-2024), Assam University, Silchar.
- Mr. Likun Pradhan: Best Poster Award; International Conference on Materials Genome (ICMG), SRM University, AP.
- Ms. Shubhangi K. Maurya: Young Scientists Fellowship; La Thuile, 2024.
- Mr. Sanjoy Sur Roy: Best Poster Award; ELSEVIER and AMBT-2023, BHU.
- Mr. Debrata Sahu: 1<sup>st</sup> place in Scientific poster presentation: Research & Industrial Conclave-Integration 2023.
- Mr. Rahul: Best Poster Award; 22<sup>nd</sup> International Workshop on Physics of Semiconductor Devices (IWPSD-2023).
- Ms. Mouli Roy Chowdhury: Sponsorship from DST Nanomission-RAL funding; JNCASR, Bangalore India (DST Nanomission-RAL Project).
- Ms. Mouli Roy Chowdhury: ICGP Fellowship at NIMS Japan; NIMS, Japan.
- Ms. Mouli Roy Chowdhury: Best Poster Award; Poster presentation at 3<sup>rd</sup> CMSM Interaction corridor, NIMS, Japan.
- Ms. Harshita Singh: Sponsorship from India-Elettra POC; IISc Bangalore, India (India-Elettra POC Funding).
- Ms. Harshita Singh: Sponsorship from the DST-DESY project; JNCASR, India (DST- DESY Project).
- Dr. Priyanka Tiwari: Sponsorship from the DST-DESY project; JNCASR, India (DST- DESY Project).
- Dr. Priyanka Tiwari: Cover Page Image for issue 35(37) of IOP Journal of Physics: Condensed Matter.
- Mr. Pranjal Choudhury: Global Development Hub Fund Fellowship; Imperial College London.
- Harekrushna Behera & Sourav Mandal: Best Poster Award; International Conference on Magnetic Materials and Applications (ICMAGMA-2023).
- Mr. Bhagwat Singh Chauhan: INUP Hackathon 2023; Center for Nanotechnology, IIT Guwahati, Guwahati, Assam.
- Ms. Amalika Patra: Best Paper award IICHe-CHEMCON 2023; Indian Institute of Chemical Engineers.
- Mr. Pranab Bera: Best Paper award IICHe-CHEMCON 2023; Indian Institute of Chemical Engineers.
- Ms. Nidhi Rawat: Prime Minister's Research Fellowship (PMRF), 2023; MHRD, Govt. of India.
- Mr. Shivam: Fermi Lab Visitor Program; Fermi National Accelerator Laboratory, USA.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
1.	Pratima Agarwal	IIT Kanpur	Professor	Amorphous and Nanocrystalline materials, Transition metal oxides and Transition metal chalcogenides, Graphene and carbon allotropes, thin film and Heterojunction solar cells, perovskite solar cells.
2.	Saurabh Basu	IIT Kanpur	Professor	Condensed Matter Physics (Theory); High TC superconductors, Optical lattices, Transport in Magnetic semiconductors.
3.	Saikat Bhaumik (Date of joining: 04.09.2023)	IACS, Kolkata	Assistant Professor	Nanomaterials, Single Crystals, Perovskites, Photophysics, DFT, Opto-electronic Devices, Bioimaging.
4.	Bipul Bhuyan	Delhi University	Professor	High Energy Physics (Experiment); CP violation, Rare K and B meson decays, ILC R & D.
5.	Subhaditya Bhattacharya	HRI, Allahabad	Associate Professor	High Energy Physics (Theory), Phenomenology of Standard Model and Beyond, Supersymmetry, Dark Matter, LHC.
6.	Bosanta Ranjan Boruah	Imperial College London	Professor	<b>Lasers and Optics (Experiment &amp; Theory);</b> Programmable Diffractive Optics, Confocal Microscopy, Phase Stepping Interferometry, Vectorial Diffraction Theory.
7.	Debasish Borah	IIT Bombay	Associate Professor	Particle Physics Model Building, Astroparticle Physics and Cosmology.
8.	Sayan Kumar Chakrabarti	SINP, Kolkata	Associate Professor	High Energy Physics (Theory), General relativity, Black hole perturbations, Gravitational waves, Cosmology.
9.	Sovan Chakraborty	SINP, Kolkata	Associate Professor	Astroparticle Physics, High Energy Astrophysics, Neutrino Oscillations, Supernovae Neutrinos, Ultra High Energy Neutrinos & Dark Matter.
10.	Santabrata Das	SNBNCBS, Kolkata	Professor	Astrophysics (Theory); Astrophysical flows around compact objects, Ultra high energy cosmic rays.



11.	Tarak Nath Dey	PRL, Ahmedabad	Professor	Quantum Optics (Theory); Coherent control of pulse propagation, Nonlinear optics, Optical solitons, Negative index media, Bose-Einstein condensates.
12.	Subhradip Ghosh	SNBNCBS, Kolkata	Professor	Condensed Matter Physics (Theory); Electronic Structure theory, Ordering and Phase stability of disordered alloys, Vibrational properties of metallic alloys.
13.	Pravat Kumar Giri	IIT Kanpur	Professor	Condensed Matter Physics (Experimental); Semiconductor nanostructures, Ion-solid interactions, Optoelectronic materials & devices, Nanotechnology.
14.	Binoy Krishna Hazra (Date of joining: 01.08.2023)	Univ. of Hyderabad	Assistant Professor	Spintronics devices, Superconducting spintronics, Magnetization switching, Spin orbit torque, Non-collinear spin textures
15.	Charudatt Y. Kadolkar	IIT Bombay	Associate Professor	Condensed Matter Physics (Theory); Magnetism, Defects in Ionic Materials, Group Theoretical approaches to Molecular Problems.
16.	Alika Khare	IIT Kanpur	Professor	Laser and Photonics.
17.	Sunil K. Khijwania	IIT Delhi	Professor	Fiber Optics (Experiment & Theory); Fiber & Integrated Optics, Photonic Crystal Fiber and Applications, Surface Plasmon Resonance based Sensors, Fiber Bragg Gratings and based Devices, Fiber Optic Sensor, Bio/Nano-Photonics.
18.	Gagan Kumar	IIT, Delhi	Professor	Terahertz Plasmonics and metamaterials, Guided Wave Devices, Ultrafast Spectroscopy.
19.	Meduri Chakravartula Kumar	Univ. of Hyderabad	Associate Professor	High Energy Physics.
20.	Debaprasad Maity	IACS, Kolkata	Associate Professor	High Energy (Theory), Cosmology, Ads/CMT, Cosmological Magneto-hydrodynamics.
21.	Rishi Maiti (Date of joining: 22.08.2023)	IIT Kharagpur	Assistant Professor	Nanophotonics, Quantum optoelectronics, Integrated photonics, Optical switching, 2D materials & Heterostructures.
22.	Uday Narayan Maiti	Jadavpur University, Kolkata	Associate Professor	Energy storage, catalysis, nanomaterials.

23.	Bibhas Ranjan Majhi	SNBNCBS, Kolkata	Associate Professor	High Energy Physics (Theory); General theory of relativity, Field theory on curved spacetimes, Black holes, Cosmology, Thermodynamical aspects of gravity, Fluidgravity correspondence.
24.	Pankaj Kumar Mishra	IIT Kanpur	Associate Professor	Nonlinear Physics (Theory and Simulation): Quantum turbulence, Instabilities and turbulence in thermal convection and MHD, Supercooled liquid and glasses.
25.	Malay Kumar Nandy	IIT Kanpur	Associate Professor	Theoretical Physics, Statistical Physics, Condensed Matter Physics, Turbulence Field Theory, Plasma Physics, Quantum Computation.
26.	Soumitra Nandi	Univ. of Calcutta	Associate Professor	High Energy Physics (Theory); Quark and Lepton Flavour Physics, Flavour Symmetries, CP violation, precision calculations in the SM, Special interest in QCD, Heavy Quark Effective Theory and Soft Collinear Effective Theory.
27.	Padma Kumar Padmanabhan	IISc, Bangalore	Professor	Condensed matter (Theory); Atomistic Modeling and Simulation of Condensed States of Matter.
28.	Dilip Pal	TIFR, Mumbai	Professor	Low Temperature Physics and Material Science (Experimental); Strongly Correlated Electron Systems, Vortex states in superconductors, Superconductivity and Magnetism.
29.	Dobbidi Pamu	Univ. of Hyderabad	Professor	Condensed Matter Physics; High-k and low loss materials, Ferroelectrics Ceramics, Oxide thin films Nanomaterials.
30.	Kanhaiya Pandey	IISc, Bangalore	Associate Professor	Atomic, molecular and optical physics (Experiment); Laser cooling and trapping of atoms, BEC, Many body physics, artificial gauge field; Atomic coherence, EIT, magnetometry; Spectroscopy and frequency metrology of optical-atomic transitions.
31.	Perumal Alagarsamy (Head of the Department)	IIT Kharagpur	Professor	Condensed Matter Physics (Experimental); Magnetism, Nanostructured Materials for energy harvesting, Nanocrystalline Materials, Magnetic Thin Films, Metallic Glasses.

32.	Poulose Poulose	PRL, Ahmedabad	Professor	Elementary Particle Physics, Collider Physics Phenomenology, Electroweak Physics Beyond the Standard Model, Cosmology and particle physics.
33.	Udit Raha	University of Bonn, Germany	Associate Professor	Quantum Chromodynamics and Nuclear Effective Field Theories.
34.	Seenipandian Ravi	Univ. of Hyderabad	Professor	Condensed Matter Physics (Experimental); Magnetism, Superconductivity, Low temperature Physics.
35.	Sitangshu Bikas Santra	Bose Institute, Kolkata	Professor	Condensed Matter Physics (Theory); Condensed Matter Physics, Statistical Physics.
36.	Amarendra Kumar Sarma	IIT Delhi	Professor	Nonlinear and Quantum Optics (Theory); Quantum Optomechanics, Optical Force, Cavity QED, Coherent control, Extreme Nonlinear Optics, Solitons, Nonlinear Fiber Optics, Nonlinear Dynamics, Plasmonics and Transformation Optics, Parity-time Symmetric Optics.
37.	Ashwini Kumar Sharma	IIT Kanpur	Professor	Pulsed laser ablation and plasma spectroscopy, Deposition and characterization of nanostructures, Plasmonics.
38.	Girish Sampath Setlur	Univ. of Illinois	Professor	Theoretical Physics; Optoelectronic properties of graphene, Nonchiral bosonization of fermions in one and higher dimensions.
39.	Vibhav Bharadwaj Shivakumar (Date of joining: 31.10.2023)	Politecnico di Milano, Italy	Assistant Professor	Ultrafast lasers, Laser Micromachining, Lab-on-a-chip Photonic and Microfluidics, Integrated Quantum Photonics, Color Centers in Diamond, Quantum Emitters in hBN.
40.	Arunansu Sil	Univ. of Calcutta	Professor	High Energy Physics & Cosmology (Theory); Phenomenology of Physics beyond the Standard Model, Supersymmetry and its breaking, Neutrino Physics, Matter-antimatter asymmetry of the Universe, Inflation.
41.	Ratnadwip Singha (Date of joining: 11.10.2023)	SINP, Kolkata	Assistant Professor	Topological materials, Low-dimensional Van der Waals systems, Single crystal growth, Electronic transport and Fermi surface properties, Photo-emission spectroscopy.

42.	Ananthkrishnan Srinivasan	IISc, Bangalore	Professor	Condensed Matter Physics (Experimental); Glasses and Disordered Materials, Thin Films, Metallic Alloys, Nanophase materials, Shape Memory Alloys.
43.	Malleswararao Tangi (Date of joining: 31.08.2023)	JNCASR Bangalore	Assistant Professor	Quantum materials, Semiconductors, Epitaxial thin films, Nanowires, Spintronics, Optoelectronics
44.	Subhash Thota	IIT Kanpur	Professor	Material Science and Engineering; Magnetic Nanostructures, Oxide Heterostructures, Superlattices, Magnetocaloric effects, Semi-magnetic semiconductors, Bandgap Engineering.
45.	Thomas Busch	Okinawa Institute of Science and Technology Graduate University, Japan	Honorary Faculty	Quantum Systems Unit.
46.	Gautam Vemuri	Indiana University-Purdue University, USA	Honorary Faculty	Atomic, Molecular and Optical Physics.
47.	Benjamin Fuks	LPTHE-CNRS-Sorbonne Université, France	Honorary Faculty	Perturbative QCD, beyond the Standard Model phenomenology, LHC physics, dark matter and the development of computing tools for high-energy physics.
48.	Alex Hansen	Cornell University, USA	Honorary Faculty	Complex matter Physics, computational Physics, Transport and breakdown phenomena in disordered systems, Physics of porous media, Physics of granular media, non-equilibrium statistical Physics.
49.	Yuya Sakuraba	Tohoku University, Japan	Honorary Faculty	Spintronics, Half-metallic Heusler compounds, Anomalous Nernst effect.
50.	V.S. Vallabhapurapu	University of South Africa, South Africa	Honorary faculty	Experimental Condensed Matter Physics, Electron Spin Resonance (ESR), Nano Magnetism, Thermal Properties of Nano and Micro Composites, Spintronics.

## Centre for the Environment

**YEAR OF ESTABLISHMENT OF THE CENTRE: 2004**

**ACADEMIC PROGRAMMES OFFERED: PhD**

### **LABORATORY FACILITIES**

- **Research laboratory – I:** (Location: first floor, I block) It is used as workplace by research students to carry out routine laboratory experiments.
- **Research Laboratory – II:** (Location: second floor, I block) It is used as workplace by research students to carry out routine laboratory experiments.
- **Analytical laboratory:** (Location: Research lab-II, second floor, I block) It is equipped with sophisticated equipment essential for environmental research.
- **Computational laboratory-** (Location: Research lab-II, second floor, I block). This facility is accessible to the students for their computer related work.
- **Institutional Biotech Hub Laboratory** including mammalian cell culture laboratory and silk rearing and culture facility.

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

- Konica Minolta Photocopier machine
- High end workstation, make: DELL
- ACER Desktop X4690G
- Hermle Refrigerated centrifuge
- UV Transilluminator
- Thermal Cycler T100, Biorad
- Oil Free compressor ¾ HP

### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

- Water and Wastewater Treatment
- Solid Waste Management and Recycling
- Environmental Bioremediation/ Environmental Biotechnology
  - Bio-sorption& Bioremediation of heavy metals
  - Bio-filtration for treating Waste Gases and Green Solvents
  - Removal of Toxic and Recalcitrant Compounds
  - Biodegradation/Bio-detoxification of Toxic Wastes
- Environmental Genomics and Proteomics
- Green Chemistry
- Greenhouse gas Capture and Storage.
- Bio-fuels
- Air pollution- Dispersion, Control & Modeling
- Waste Immobilization
- Soil-water-contaminant Interaction
- Contaminant Transport and Retention in Porous Media
- Environmental History
- Environmental Economics
- Green Design
- Global Warming and Climate Modeling
- Seri-biotechnology and Seri-informatics and other related areas

## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

Some of research works ongoing in the centre in the form of projects, patent and consultancies in the current period are listed below:

- Nature-inspired Pt-doped TiO<sub>2</sub> and Au-doped TiO<sub>2</sub> photocatalysts development with the aim of achieving a lower bandgap, delayed recombination, and a highly hydrophilic surface for enhanced visible light-driven photocatalytic degradation of pharmaceutical waste. Development of an efficient pilot-scale system for recovery of catalysts.
- Patented technology development on ‘Process for removal of Chromium from Linz-Donawitz slag’
- Patented technology development on ‘Preparation of high surface area activated carbon by using waste tea leaves’
- Development of food and feed products from Eri Silkworm protein isolate”,
- A cost-effective strategy and prototype development for community wastewater treatment & reuse In Farmers Field
- Technology development of vinegar production from indigenous fruits Leteku (*Baccaurea motleyana*), Kordoi (*Averrhoa carambola*), Poniyal (*Flacourtia jangomas*) of Assam
- Biosurfactant mediated enhanced oil recovery from Assam oil reservoirs
- Sustainable, Biodegradable and Affordable Substitutes for Single use Plastic using Castor Oil and Stubble Aggregate
- Prototype development for catechins extraction and production of low cost antioxidant tablets and capsules
- **Development of catalysts and a prototype device for conversion of CO<sub>2</sub> to fuels/chemicals**
- Study of microbial phylogeny of petroleum hydrocarbon contaminated sites to identify potent biosurfactant producing microbial isolates and develop efficient microbial consortium as an end-to-pipe solution for bioremediation of hydrocarbon contaminated soil and water.
- Black and Grey water sample analysis
- Petrographic analysis, silt load and silt content analysis in water from hydroelectric power plants.

## CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
01	Prof. Animes Kumar Golder	IChE - CHEMCON 2023	Kolkata, India	27/12/2023 – 30/12/2023	International
02	Prof. Animes Kumar Golder	Int. Conf. on Renewable Energy and Environment Engineering (REEE) 2023	Brest, France	23/08/2023 – 25/08/2023	International
03	Prof. Animes Kumar Golder (Presented by: Ravi)	IChE - CHEMCON 2023	Kolkata, India	27/12/2023 – 30/12/2023	International
04	Prof. Animes Kumar Golder (Presented by: Ravi)	Research & Industrial Conclave (RIC)	IIT Guwahati, India	14/05/2023 – 16/05/2023	National

05	Prof. Animes Kumar Golder (Presented by: Aquib Jawed)	Fast track microplastics research: Advanced automated workflows for environmental analysis (Webinar)	Online mode	21/11/2023	International
06	Dr. Krishna P. Bhabak	MTIC-2023	IISc, Bangalore	14/12/2023-17/12/2023	International
07	Dr. Krishna P. Bhabak	SABIC-2024	IACS, Kolkata	7/01/2024-11/01/2024	International
08	Dr. Krishna P. Bhabak	ETCS-2024	IIT Kharagpur	7/03/2024-09/03/2024	International
09	Dr. Manabendra Sarma	Radiation Damage to Genetic Material (RDGM) 2023	IIT Bombay	04/07/2023 – 05/07/2023	National
10	Dr. Manabendra Sarma	Structure and Dynamics: Spectroscopy and Scattering (SDSS-2023)	IACS, Kolkata	05/10/2023 – 08/10/2023	National
11	Dr. Manabendra Sarma	26th International Workshop on Quantum Systems in Chemistry, Physics, and Biology (QSCP-XXVI)	Jaipur	14/10/2023 – 20/10/2023	International (invited talk)
12	Dr. Manabendra Sarma	Theoretical Chemistry Symposium (TCS) 2023	IIT Madras	07/12/2023 – 10/12/2023	National
13	Dr. Manabendra Sarma	2nd National Conference on Emerging Challenges in the Frontiers of Chemical Sciences NC-ECFCS-2024)	Manipur University	21/03/2024 – 23/03/2024	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Dr. Krishna P. Bhabak	Bioanalyte-triggered Turn-On Fluorogenic Processes for the Simultaneous Delivery of Hydrogen Sulfide and Drugs	IISc, Bangalore	Bangalore	17/12/2023
02	Dr. Krishna P. Bhabak	Stimuli-Responsive Turn-On Fluorogenic Processes toward the Delivery of Hydrogen Sulfide and Drugs	IACS, Kolkata	Kolkata	07/01/2024
03	Dr. Krishna P. Bhabak	Stimuli-responsive Fluorogenic Prodrug for the Simultaneous Delivery of Diclofenac and Hydrogen Sulfide	IIT Kharagpur	Kharagpur	08/03/2024



04	Dr. Manabendra Sarma	Theoretical Chemistry: Quo Vadis?	Department of Chemistry, NIT Surathkal	Karnataka, India	12/04/2023
05	Prof. Animes Kumar Golder	Bio-based Metal Doped Photocatalysts for Enhanced Photocatalytic Functionalities	University of Brest	Brest, France	23/08/2023 – 25/08/2023
06	Dr. Manabendra Sarma	A Computational Exploration of Noncovalent Interactions in Supramolecular Host-Guest to Peptide-based Molecular Anion Receptors	Department of Inorganic and Physical Chemistry, IISc Bangalore	Bangalore, Karnataka, India	13/04/2023
07	Dr. Manabendra Sarma	Advancing Careers and Exploring Cutting-Edge Research Directions in Chemistry	Science Camp under Vigyan Jyoti Programme	IIT Guwahati	30/06/2023
08	Dr. Manabendra Sarma	Photochemical Reactions of Conjugated Polyenes: Effect of Substitutions	IIT Bombay	Mumbai, Maharashtra,	12/10/2023

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Prof. Tomoyuki Nakagawa	Gifu University, Japan	The potential and capability of methylotrophic yeast <i>Ogatoea methanola</i> in a methanol bioeconomy	11/10/2023-12/10/2023	Bioeconomy 2023
02	Prof. Akio Ebihara	Gifu University, Japan	Bioeconomic potential for utilization of Assam bamboo resources approached by IITG Gu global JDP platform		
03	Dr. Jagannath Biswakarma	University of Bristol, UK	Unlocking circular economy potential: Role of iron minerals in critical mineral recovery		
04	Prf. Daisuke Shibata	Gifu University, Japan	Bioeconomy activities in Japan		
05	Prof. Yong Pyo Lim	Human friendly agricultural research institute, South Korea	A new paradigm of future agriculture: human-friendly agriculture		
06	Prof. Bernhard kashner	Univ of natural resources and life sciences, Vienna	Transformative bioeconomy- a new global paradigm for social justice and ecological sustainability		
07	Prof. Pulok Mukherjee		Bioeconomy from bioresources-perspectives of		

			therapeutically important resources of NE India		
08	Dr. Jagannath Biswakarma	University of Bristol, UK	Impact of Environmental Changes on Water in Engineered & Natural Systems	05/06/2023	World environment Day celebration 2023
09	Prof. Partha Pratim Baruah,	Gauhati University	Algae: A solution to plastic pollution		
10	Arun Mitra	Bee Keeper and entrepreneur, Khetri	Self employment with honeybees	22/05/2023	International Day for biological diversity
11	Roshan Upadhay	Butterflyman, Arunachal Pradesh	Conservation, livelihood and the flying jewels (butterfly)		
12	Dr. Kartik Neog	Director MESSO, central silk board, Khanapara			
13	Dr. Tarun Chandra Bora	VC, Krishnaguru adhyatmik viswavidyalay			
14	Dr. Dipjyoti Rajkhowa	ICAR-RCNEH Nagaland	Agricultural biodiversity		
15	Prof. Steven E Linodw	Professor Emeritus, Deptt. of Plant & Microbial Biology Univ of California Berkley, USA	Understanding microbial life on leaves	23/11/2023	An awardee of the prestigious BP Pal Chair of the Indian National Science Academy (INSA)

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/National	No. of participants
01	Prof. Utpal Bora (Chairperson)	Bioeconomy 2023		11/10/2023-12/10/2023	National	200
02	Prof. Utpal Bora (Chairman)	International day for biological diversity		22/05/2023	National	50

## STUDENTS' ACHIEVEMENTS

- Mr. Krishna Kanta Bora: Best Poster Presentation in 6th Int. Symposium on Advances in Sustainable Polymers – 2023; Nepal Academy of Science and Technology, Kathmandu.
- Mr. Aniket Banerjee: First Place in SCIENTIFIQUE: Research & Industrial Conclave- Integration '23, IIT Guwahati.
- Mr. Ravi Vashist: First Place in SCIENTIFIQUE: Research & Industrial Conclave- Integration '23, IIT Guwahati.
- Ms. Udaratta Bhattacharjee: Best Oral Presentation, National Conference on Gau-Vigyan in Modern Life and Medical Science (NCGV-2023), IIT Guwahati.
- Mr. Prangan Duarah: Best poster Presentation, Materials Today Conference 2023, Singapore, Elsevier Materials Science.
- Mr. Vivek Singh Yadav: Rudolf Cimdins scholarship & International travel support scheme, SERB.
- Ms. Akshita Kanwar: Best Poster, Carbo-XXXVII Int. conference on basic analytical and allied sciences at the interface of carbohydrates and biomass valorisation, Delhi Technological University & ACCTI.
- Ms. Akshita Kanwar: ACCTI-Young Scientist Award-2023, Carbo-XXXVII Int. conference on basic analytical and allied sciences at the interface of carbohydrates and biomass valorisation, Delhi Technological University & ACCTI.
- Mr. Gourav Bhattacharjee: Best poster presentation, 64th Annual International Conference "Microbes for LiFE: A strategy for well-being (MLiFE-2023)"; Bundelkhand University, Jhansi, Uttar Pradesh.
- Ms. Aswani K. Viswanath: Best paper award (Oral Presentation), IChE-CHEMCON 2023; Heritage Institute of Technology , Kolkata.
- Ashlesha Manta: Best oral presentation, Int. Conf. on Current Trends in Biological Sciences; Mizoram University.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Or g PhD degree received from	Designati on	Areas of Interest
1.	A. B. Kunnumakkara	University of Calicut, Kerala, India,	Professor	Role of inflammatory pathways in cancer development, Identification of novel biomarkers for cancer diagnosis and prognosis, Cancer drug discovery, Development of transgenic and gene knockout mouse models for biomedical research.
2.	Aiyagiri Ramesh	CFTRI, Mysore	Professor	Nanobiotechnology, Chemistry-Biology Interface for Developing Antibacterials and Sensors
3.	Ajay Kalamdhad	IIT Roorkee	Professor	Solid waste management, mechanical composting and vermicomposting, analysis of solid wastes, water and waste water Treatment

4.	Anamika Barua	University of Leeds, UK	Professor	Socio-economic understanding of climate risk and resilience, urban living and sustainable cities
5.	Animes K. Golder	IIT Kharagpur	Professor	Electro- and bio-remediation of heavy metals, Physiochemical water treatment techniques, Homogeneous and heterogeneous catalytic AOPs, Extraction and separation of value added chemicals from natural sources
6.	Arun Goyal	IIT Kanpur	Professor	Molecular Biology, Protein Engineering, Structural and Functional Proteomics of Carbohydrate active enzymes and other industrial microbial enzymes.
7.	Arup Kumar Sarma	Gauhati University	Professor	Modeling & simulation in Free Surface Flow, Heuristic Method in Reservoir Optimization, GIS based Watershed Modeling
8.	Bhisma K. Patel	IIT Kanpur	Professor	Bio-Organic Chemistry and Newer Methodologies, Green Chemistry, Heterocyclic Chemistry
9.	Bishnupada Mandal	IIT Kharagpur	Professor	Separations with chemical reaction, Molecular based membrane separation, Modeling and simulation of separation processes, Environmental pollution control
10.	Chandan Das	IIT Kharagpur	Professor	Membrane based separation technology, Bioremediation using <i>Spirulina Platensis</i> , blue-green microalgae, Supercritical fluid extraction for the production of peonidin, peonidin 3-glucoside and cyanidin 3-glucoside from black rice and 6-gingerol, vitamin C content, essential oil content from ginger of North East India of North East India, Natural products, namely, aloe vera, polyphenol, stevia, lycopene extraction and purification
11.	Chandan Mukherjee	Max-Planck Institute for Bioinorganic Chemistry, Muelheim, Germany	Professor	Oxidation Catalysis, Molecular Magnetism, Synthesis of Single-Molecule Magnets (SMMs), MRI Contrast agents, Water Oxidation Chemistry
12.	Chivukula V. Sastri	University of Hyderabad	Professor	Biomimetic Chemistry and Chemical Biology

13.	Debasish Manna	University of Illinois, Chicago, USA	Professor	Ion transport, Liposomal drug delivery, Drug discovery and immunotherapy.
14.	G Pugazhenth	IIT Kanpur	Professor	Membrane Separation Process, Polymer Nanocomposite, Nanomaterials, Adsorption, Wastewater Treatment
15.	Gopal Das	IIT Kanpur	Professor	Supramolecular, Bioorganic chemistry and Biomineralization
16.	Gurvinder K. Saini	Andhra University, Vishakapatnam	Professor	Fungal Biotechnology
17.	Kannan Pakshirajan	IIT Madras	Professor	Biological removal and recovery of inorganic compounds from wastewaters; Biological treatment of industrial wastewaters; Biodegradation of xenobiotic, Biofuels and other Biotechnological Products: Production; Process design, kinetics and optimization; Environmental applications
18.	Karuna kalita	University of Nottingham, UK	Professor	Coupled Dynamics of Electro-Mechanical Systems   Vibration   Rotordynamics
19.	Kaustubha Mohanty	IIT Kharagpur	Professor	Bio separation, Biofuels, Biological wastewater treatment, Membrane technology, Ionic liquids
20.	Krishna Pada Bhabak	Indian Institute of Science, Bangalore, India	Associate Professor	Design and Synthesis of Potential Bio-active Organic Compounds, Anti-cancer and Antioxidative Properties of Synthetic Organic Compounds, Selective Fluorescent Delivery Agents for Anti-cancer Compounds, Understanding their Behavior at Cellular Environment
21.	Lal Mohan Kundu	LMU Munich, Germany	Professor	Nucleic Acid / Peptide Chemistry, DNA / RNA Damage and Repair, DNA Hybrid Materials
22.	Lalit M. Pandey	IIT Delhi	Associate Professor	Surface and interfacial science particularly in the area of Bio-interfaces and
23.	M. K. Dutta	Gauhati University	Professor	Microeconomics, Agricultural Economics, Environmental Economics, Econometrics
24.	Manabendra Ray	IIT Kanpur	Professor	Design and synthesis of coordination complexes or assemblies of complexes with chiral ligands to use as chiral host to facilitate binding and separation of chiral molecules.

25.	Meena Khwairakpam	IIT Roorkee	Assistant professor	Solid waste management • Mechanical composting and vermicomposting • Analysis of solid wastes • Biological Waste treatment • Integrated Waste Management • Water Supply and Sanitation
26.	Mihir K. Purkait	IIT Kharagpur	Professor	Membrane Technology, preparation/fabrication of ceramic/polymeric membranes and their application in RO, NF, UF and MF), Treatment of Industrial Effluent Surfactant mediated separation, Responsive materials for environmental, biological and chemical separation
27.	Mohammad Jawed	IIT Kanpur	Professor	Biological Processes, Anaerobic Wastewater Treatment, Heavy Metal Removal and Recovery, Water Treatment and Supply, Domestic & Industrial Wastewater Treatment
28.	Pankaj Tiwari	University of Utah, Salt Lake City, USA, 2012	Associate Professor	Conventional and unconventional energies, Reservoir Engineering, Complex organic solids, Biomass conversion, Pyrolysis process, Kinetic analysis
29.	Pranab Kumar Ghosh	IIT Kharagpur	Professor	Water treatment for domestic and industrial use, Domestic and Industrial wastewater treatment and Sludge treatment by physicochemical and biological process.
30.	Ramagopal VS Uppaluri	University of Manchester, England	Professor	Multi-heavy metal removal from waste streams using chitosan-based derivatives; Jeevamrutha bio-fertilizer; Machine learning applications for large scale municipal solid waste management
31.	Ranjan Tamuli	Centre for Cellular and Molecular Biology, Hyderabad, Degree awarded by JNU, New Delhi.	Professor	Environment and Fungi
32.	Sandip Paul	IIT Kanpur	Professor	Computational Biophysics and Chemistry.
33.	Sanjukta Patra	Central Food Technological Research Institute, Mysore	Professor	Enzyme and microbial technology, Metagenomics, Biosensors, Environmental Biotechnology
34.	Saswati Chakraborty	IIT Mumbai	Professor	Water and Wastewater Treatment, Biodegradation of Industrial Wastewater and Removal of Heavy Metals from Wastewater

35.	Senthil K. Sivaprakasam.	Central Leather Research Institute, Chennai, India.	Professor	Biocalorimetry, Bio-Process Analytical Technology (BioPAT) (synthesis of recombinant proteins and value-added bioproducts), Real-time monitoring and control of bioprocess systems (BioPAT) (Biocalorimetry, Dielectric Spectroscopy and Exhaust Gas Analyzer), Mathematical modeling of bioprocess systems, Monitoring and control of environmental bioprocess systems leading to value-added products
36.	Senthilmurugan S	IIT Delhi	Professor	Modeling & Optimization of Novel Processes, Process Design & Operation of Membrane Separation Processes, waste water treatment for Process Industries, Novel Desalination Technologies, Smart Water Grid, Waste to Energy
37.	Sharad Gokhale	IIT Delhi	Professor	Urban Vehicular Pollution, Industrial Stack Pollution, Indoor Air Pollution, Environmental Impact Assessment, Air Quality Modeling
38.	Subashisa Dutta		Professor	Satellite Remote Sensing and GIS for Water resources Management, Computational river hydraulics and its applications, Watershed and Irrigation Management
39.	Subhendu Sekhar Bag	IIT Kharagpur	Professor	Environmental Chemical Biology, Environmental Nanotechnology, Organic Chemistry, Environmental Chemistry
40.	Subrata Kumar Majumder	IIT Kharagpur	Professor	Process Intensifications in Chemical Processes, Intensification in environmental process system, Micro-nano bubble science and technology and its applications, Microchannel-based and Jet driven gas-aided extraction, Mineral Beneficiation, Enhanced Oil Recovery by Micro nanobubble, Multiphase Flow and Reactor Development
41.	Tapas Kumar Mandal	IIT Kharagpur	Professor	Multiphase multiphase flow, Bio flow & Measurement i
42.	Tamal Banerjee	IIT Kanpur	Professor	Phase equilibria of ionic liquids, Molecular simulations, Global optimization, Statistical thermodynamics.
43.	Utpal Bora	Institute of Genomics & Integrative Biology, Delhi (degree awarded)	Professor	Biodiversity, Ecology, Environmental Informatics, Environmental Policy

		by GGS Indraprastha University, Delhi).		
44.	Vaibhav V. Goud	IIT Kharagpur	Professor	Heterogeneous Reactions, Bio-energy and Green Engineering, Bio lubricant, Utilization of Lignocellulosic Biomass for Fuel/Chemicals, Supercritical Fluids
45.	Venkata V. Dasu	IIT Madras	Professor	Bioprocess development (upstream to downstream), Metabolic Engineering, Bioenergy.
46.	Vijay S. Moholkar	University of Twente, Netherlands	Professor	Bubble dynamics, CFD, Sono-process engineering, Bio-mass gasification
47.	Vimal katiyar	IIT Bombay	Professor	Synthetic and Natural Polymers, Polymer Processing, Biothermoset, Nanobiocomposite, Organic Solar Cells.
48.	Vishal Trivedi	Central drug research institute, Lucknow	Professor	Intracellular Signaling in Plasmodium falciparum.



# Centre for Indian Knowledge Systems

**YEAR OF ESTABLISHMENT OF THE CENTRE: 2021**

**ACADEMIC PROGRAMMES OFFERED: PhD**

**LABORATORY FACILITIES**

Meditation related; One with EEG facility.

**MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

32 Channel Electroencephalogram System, Make: Allengers Global Health Care Pvt. Ltd., Model: Virgo-32

**MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Ceramic traditions of Assam, Traditional agriculture practices, Ancient architecture, Food practices, Preservation of Indian Knowledge: Museum, History of Indian Science and Technology.

**INVITED LECTURES OF FACULTY: IN INDIA, ABROAD**

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Prof. Uday Shanker Dixit	Importance of cow protection in Indian culture (in Hindi)	National Conference on Gau-Vigyan in Modern Life and Medical Science (NCGV-2023)	IIT Guwahati	May 20, 2023
02	Prof. Uday Shanker Dixit	Career Planning for class 9 and 10 students	Gandhiji Uchcha Madhyamik Prathmik Bidyapeeth,	Digunpar (Leja), Kamrup (rural), Assam	May 27, 2023
03	Prof. Uday Shanker Dixit	Role of Mathematics and Statistics in Experimental Study	Department of Chemistry, B. Borooah College	Guwahati	June 20, 2023
04	Dr. Lalit M. Pandey	Plant Ayurveda	Dibrugarh University Institute of Engineering and Technology	Dibrugarh	August 9, 2023
05	Prof. T V Bharat	Scientific Aspects of Ancient Engineering Practice	National Youth Conference on IKS	IIT Roorkee	25-27 August 2023
06	Dr. Lalit M. Pandey	Science, Engineering and Technology	Girijananda Chowdhury University	Guwahati	September 15, 2023
07	Prof. Uday Shanker Dixit	Indian Knowledge System	Department of English, The Assam Royal Global University	Guwahati	September 22, 2023
08	Prof. Uday Shanker Dixit	Address for aspirant of competitive examinations	BTR Super 50 (Engineering)	Kokrajhar, Assam	September 29, 2023
09	Prof. T V Bharat	Ancient Engineering Knowledge Systems	NITTTR Kolkata	Kolkata (Online)	30 September 2023
10	Prof. T V Bharat	Faculty Training Program (FTP) on Ancient Engineering Knowledge Systems	Gauhati University	Guwahati	Guwahati, 9-14 Oct 2023
11	Prof. Uday Shanker Dixit	Education as per NEP 2020	NIT Meghalaya	Shillong (online)	December 11, 2023

12	Prof. T V Bharat	Vāstu – An Eternal holistic engineering & Architectural Approach of BHĀRAT	Maa Devaki Vedapathasala, Tiruvannamalai	Chennai	27-28 December 2023
13	Prof. T V Bharat	Water conservation systems of Ancient India (BHĀRAT)	NIT Calicut	NIT Calicut	30 January – 3 February, 2024
14	Prof. Uday Shanker Dixit	Indian Knowledge System	Directorate of Technical Education	Assam Administrative Staff College, Khanapara	March 27, 2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl.No	Name	Name of Inst./Univ./Org.	Date	Purpose/ Name of Lecture
1.	Prof. Amitabha Ghosh	Former Director of IIT Kharagpur and Advisor of the Center.	09-04-2023	Talk about Aryabhata
2.	Dr. Mamta Mishra	Vivekananda health global, K K Tower, G S Road Ulubari Near S B Deorah College, Guwahati	21-04-2023	Panchagavya and Panchakarma-relation in Healing
3.	Sri Asim Banerjee	Former HR Professional in PepsiCo, ICI and Times of India	June 15-2023	Title : Meditation for complete health (Speaker will narrate his personal experience)
4.	Dr. Rajeshwar Mukherjee	Nalanda University	June 15-2023	Title : Cosmopsychism in the light of Indian Knowledge System (It is about broad field of consciousness.)
5.	Dr.Phil Subrata Chattopadhyay Banerjee	Ex- RWTH Aachen University, Germany, presently in Kolkata	June 28, 2023	Title :- Brahmo Samaj as an actor in the dissemination of Aryan invasion theory (AIT) in India (online)
6.	Dr. Suvrokamal Dutta	Advisor to several media houses	August 4,2023	GREATER INDIA OF THE PAST - RELOOK BACK INTO THE PAST HISTORY
7.	Swami Samanand Giri	Head of two Math, one at Maheshwar, MP, and another ashram at Haridwar	August 7,2023	Risk: A quantum jump in life
8.	Dr.Phil Subrata Banerjee	Ex- RWTH Aachen University, Germany, presently in Kolkata	August 30,2023	"Nurturing Health in Crisis: Insights from Charaka Samhita on Pandemic Preparedness and Prevention" (online)

9.	Prof. Debi Prasad Mishra	Director NITTTR, Kolkata, Professor, Aerospace Department, IIT Kanpur	September 11, 2023	Relevance of Indian Traditional Technology in Modern Era (11th September 2023 at 5 PM)
10.	Prof. Debi Prasad Mishra	Director NITTTR, Kolkata, Professor, Aerospace Department, IIT Kanpur	September 12, 2023	An Introduction to Indian Traditional Temple Architecture (12th September 2023 at 11 AM)
11.	Dr.Phil Subrata Banerjee	Ex- RWTH Aachen University, Germany, presently in Kolkata	September 14, 2023	"Nurturing Health in Crisis: Insights from Charaka Samhita on Pandemic Preparedness and Prevention" (online)
12. D r	Dr. Arvind Jain	NIT Agartala	15-11-2023	Jain Darshan (online)
13.	Prof. Debi Prasad Mishra	Director NITTTR, Kolkata, Professor, Aerospace Department, IIT Kanpur	December 11, 2023.	"Environment Consciousness in Ancient India"
14.	Swami Samanand Giri	The head of two Math, one at Maheshwar, MP, and another ashram at Haridwar.	December 15, 2023.	"Purposeful Living Using Ancient Indian Philosophies"
15. D	Dr. Amit S. Mishra	Dirghayuh Treatment Centre, Kalyan, Mumbai	18-12-2023	One-to-one interaction on lifestyle modification and stress management
16.	Prof. Malinee Goswami	Former Prof. Guwahati University and former Senate Member, IIT Guwahati	08-01-2024	Contributions of Pandit Hemchandra Goswami
17. o	Prof. V.K. Jain	Former Professor IIT Kanpur	16-01-24	Jain Philosophy: An overview
18.	Dr. Hosh Ram Yadav	Former Adjunct Professor at IIT Kanpur	Feb 9, 2024	Art of Tunneling
19.	Dr. Amit S. Mishra	Dirghayuh Treatment Centre, Kalyan, Mumbai	11-02-2024 to 18-02-24	Series of lectures and practical sessions on Stress Management
20.	Dr. Suvrokalal Dutta	Advisor to several media houses	March 15, 2024	"Communication in Ancient India"

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1	Dr. Gaurav Trivedi/ Dr. Hanumant Singh Sekhawat Dr. Lalit Mohan Pandey	National Conference on Gau Vigyan.	M/s Krishna Enterprise, Assam/Bimal Kur. Jain, Ms. Jaldhara and Co., Ms. Zenith India, M/s Infinity Solutions, Nagrik Samabay Bank	20-05-2023 to 21-05-2023	National	200

			Limited, Kavikrishna, Shree Guwahati Gausala, SERB, Various Govt and non Govt Agencies.			
2	Prof. Sukanya Sharma Dept of HSS, Dr. Faladrum Sharma, Project Officer CIKS, Dr. Priyanka Tamta, Project Staff HSS.	Vaishnavite Traditions and Practices of North East India	Pandit Hemchandra Goswami Foundation	4-11-2023	National	50
3	Prof. T V Bharat	Construction and Application of Ancient Indian Astronomical Yantras: Documentation and Training	IKS, MoE	4-7 December 2023	National	30
4	Dr. Srinivasan K, Dept of EEE, Dr. Ribhu, Dept of EEE	International Conference on History of Mathematics	1. Dr. Naba Goswami Foundation 2. Pandit Hemchandra Goswami Foundation 3. Dr. Vishal S. Sharma, Australia 4. Central Institute of Technology Kokrajhar 5. BMG INFORMATICS PVT. LTD., Guwahati 6. Er. Dharendra Sinha, B.Tech. (2001), IIT Guwahati	19-01-2024 to 21-01-2024	International	50
5.	Dr.Lalit Pandey, Dr Faladrum Sharma	Sri Aurobindo International Youth Conference	Auroville Foundation, Pondicherry	25-02-2024	National	250

## FACULTY MEMBERS

Sl. No	Name	Name of the University/Institute/Or g PhD degree received from	Designation	Areas of Interest
1.	Prof. Sukanya Sharma	Deccan College PG & Research Institute, Pune	Professor	Ancient Indian History, Culture and Archaeology
2.	Prof. TV Bharat	IISc Bangalore	Professor	Ancient Indian Architecture (Vastu)
3.	Prof. Arbind K. Singh	IISc Bangalore	Professor	

4.	Dr. Indu Siva Ranjani G	IIT Madras	Assistant Professor	Sustainable building materials, energy efficient structures, lightweight concrete
5.	Prof. Konjengbam Darunkumar Singh		Professor	
6.	Dr. Pankaj Kalita		Associate Professor	
7.	Prof. Prabhu Venkataraman		Professor	
8.	Prof. Ramagopal Uppaluri		Professor	
9.	Prof. S. Senthilvelan		Professor	
10.	Prof. Shakuntala Mahanta		Professor	
11.	Dr. Siddhartha Singha		Assistant Professor	
12.	Dr. Srinivasan Krishnaswamy	IIT Bombay	Associate Professor	Nyaya
13.	Prof. Uday Shanker Dixit	IIT Kanpur	Professor	Modelling, History of Science & Technology, Folktales, <i>Puranas</i>
14.	Prof. Vimal Katiyar		Professor	
15.	Dr. Pahi Saikia		Associate Professor	
16.	Prof. Arun Goyal		Professor	
17.	Prof. Amarendra Kumar Das	IIT Guwahati	Professor	
18.	Prof. Utpal Bora		Professor	
19.	Dr. Santosh Jagtap	University of Cambridge, UK	Associate Professor	Design process improvement, art and craft, design and culture, design for sustainability
20.	Dr. Mithilesh Kumar Jha		Assistant Professor	
21.	Dr. Lalit Mohan Pandey	IIT Delhi	Associate Professor	Health, Puranas
22.	Dr. Supradip Das	IIT Guwahati	Assistant Professor	Design for craft revival, Indigenous product design and development, Design for Sustainability

**Centre for Nanotechnology**

**YEAR OF ESTABLISHMENT OF THE CENTRE:** 2004

**ACADEMIC PROGRAMMES OFFERED:** Doctor of Philosophy PhD

**LABORATORY FACILITIES**

The Centre for Nanotechnology have a total of 21 numbers of laboratories in the existing facilities, out of which one has been set up in the CIF. The basic instruments/equipment facilities available in each laboratory are listed below:

<b>Sl.No.</b>	<b>Name of the lab</b>	<b>Name of the instruments/equipment</b>	<b>No. of instruments</b>
<b>1.</b>	<b>ISO-5 Cleanroom</b>	FESEM-Electron Beam Lithography	01
		Mask writer	01
		Double Sided Mask Aligner	01
		Upright Optical microscope	01
		Plasma cleaner	01
<b>2.</b>	<b>ISO-6 Cleanroom</b>	Thermal and E-Beam Evaporator	01
		RF Sputtering	01
		Electro Spinning Device	01
		PECVD	01
		RIE	01
		Laser Micro Machining	01
<b>3.</b>	<b>Electrical Characterization Lab</b>	PLD	01
		Controlled Environment Chamber	01
		RF Probe Station	
		<ul style="list-style-type: none"> <li>• RF Probe Station</li> <li>• Vector Network Analyzer</li> <li>• RF signal generator</li> <li>• RF frequency counter</li> </ul>	01 01 01



			01
		AC/DC Probe Station	
		<ul style="list-style-type: none"> <li>• DC Probe Station</li> <li>• IV CV Pulse parametric Analyser</li> <li>• Impedance Analyser</li> <li>• Chemical Impedance Analyzer</li> <li>• Digital Storage Oscilloscope</li> <li>• Function Generator</li> <li>• Digital multimeter</li> <li>• DC Power supplies</li> </ul>	01 01 01 01 02 01 01 01 01
		DC probe Station	01
<b>4.</b>	<b>Materials Characterization Lab</b>	AFM-TERS	01
		Raman spectroscopy	01
		Material Printing System	01
		<ul style="list-style-type: none"> <li>• UV IOzone Tip cleaner</li> </ul>	01
		Fume Hood	01
		Glove Box	01
		<ul style="list-style-type: none"> <li>• Hot plate</li> <li>• Analytical balance</li> <li>• Spin coater</li> <li>• Mini sputter coater</li> <li>• AAA Solar Simulator</li> </ul>	01 01 01 01 01
		UV-Visible Spectrophotometer	01

		Wire Bonder	01
		DWS Rheolab	01
<b>5.</b>	<b>Optical Characterization Lab</b>	High End Confocal Microscope	01
		HPLC	01
<b>6.</b>	<b>Material Res. Lab</b>	Laminar air flow	01
		Ultra-low temperature freezer (-80 °C)	01
		UV spectrophotometer	02
		Microwave oven	01
		Agarose gel documentation system, Gel logic	01
		Regulated DC Power Supply	01
		Electromagnet	01
		Digital Gauss meter	01
		Digital Weighing balance	01
		Inverted Microscope	01
		Nanovoltmeter	01
		Source Meter	01
		Refrigerated Centrifuge	01
		Magnetic stirrer	01
<b>7.</b>	<b>Cleanroom (Chemical Storage Room)</b>	Ultrasonic Processor	01
		Ultrasonic Bath	02
		Bench Top Incubator cum orbital Shaker	01

		Magnetic stirrer with hot plate digital	04
		Digital pH Meter	01
		Analytical Balance	02
		Lyophilizer	01
		Carbon Coater	01
		Refrigerated High Speed Centrifuge	01
		-20 degree Upright Freeezer	01
<b>8.</b>	<b>ICMR Lab</b>	Auto Analyzer	
		<ul style="list-style-type: none"> <li>• Electrolyte Analyzer</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Biochemistry analyzer</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Hematology Analyzer</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Multiplate Reader</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Disc Based Clinical Analyzer</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Erythrocyte Sedimentation Rate Analyzer</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Coagulation Analyzer</li> </ul>	01
		Advanced Elisa Basic Unit	01
		<ul style="list-style-type: none"> <li>• Visualization Unit</li> </ul>	01
		3D Printer	
		<ul style="list-style-type: none"> <li>• 3D Printer for Fabrication</li> </ul>	04
		<ul style="list-style-type: none"> <li>• Material Extrusion System</li> </ul>	01
		<ul style="list-style-type: none"> <li>• Material Extrusion System</li> </ul>	01

		<ul style="list-style-type: none"> <li>Fused Filament Fabrication Printer for polymers</li> </ul>	02
		<ul style="list-style-type: none"> <li>Fused Filament Fabrication Printer for polymer Fabrication</li> </ul>	04
		<ul style="list-style-type: none"> <li>Fused Deposition Modelling Printer for polymer Fabrication</li> </ul>	01
		<ul style="list-style-type: none"> <li>Stereolithography System</li> </ul>	01
		<ul style="list-style-type: none"> <li>Laser Ablation System</li> </ul>	01
		<ul style="list-style-type: none"> <li>Vinyl Plotter for Laser Ablation Masks</li> </ul>	01
		Ultimaker 3FDM 3D printer	01
9.	<b>Cell culture Lab</b>	Flow Cytometry	01
		Chemi doc MP Imaging	01
		Fluorescent Cell Imager	01
		-20°C Upright Freezer	01
		2-10°C Refrigerator	01
		LN <sub>2</sub> Container	01
		Water bath	01
		Refrigerated Micro-Centrifuge	01
		CO <sub>2</sub> Incubator	01
		Table Top Multipurpose Refrigerated Centrifuge	01
		Real Time PCR System	01
10.	<b>Optoelectronic Device Fabrication Lab</b>	This lab has been set up in the CIF and it deals with the fabrication of $\pi$ -conjugated organic molecules (monomers, oligomers and polymers) for various applications like organic light emitting diodes,	

		photovoltaic devices, thin film transistors, memory devices, biomedical devices and sensors.	
<b>11.</b>	<b>Nanobiotech Lab</b>	BD FACS Calibur	01
		UV-Vis Spectrophotometer	01
		Fluorescence spectrophotometer	01
		FluoroLog-3	01
		Water purification system Milli Q / Elix	01
		Dynamic Light Scattering (DLS), Malvern Zetasizer Nano	01
		Micro plate reader	01
		Real Time PCR (Applied Bio system)	01
		Vortex	01
		Shaking Incubator	01
		Rocker	01
		Refrigerator	01
		CO <sub>2</sub> incubator	01
		Epi fluorescence microscope (Nikon eclipse)	01
		Water bath	01
Digital Weighing Balance	01		
Horizontal Laminar hood	01		
<b>12.</b>	<b>Synthesis Lab</b>	Horizontal Laminar Air Flow Work Station	01
		Hot air oven	01

		Refrigerated Bath Circulator	01
		Portable autoclave	02
		Digital Weighing Balance	03
		pH meter	03
		Microwave oven	01
		Cooling centrifuge (Sigma)	02
		Agarose gel electrophoresis set up	01
		Rotary Vacuum	01
		UV Transilluminator	01
		Magnetic stirrer	05
		Mini water bath	01
		Dessicator	03
		Spin coater	02
		Bacteriostatic incubator	01
<b>13.</b>	<b>Nano Fabrication Lab</b>	Laboratory developed (assembled) Chemical Vapour Deposition (CVD)	02
		Thermal Evaporation coating system	01
		Electron Beam deposition system	01
		RF Sputtering deposition system	01
		Rapid Thermal Annealing system	01
		Spin coating system	01
		Bath and Tip Sonication	02

		Laboratory developed (assembled) Probe station for I-V and Photo conductivity measurements	01
		Heating woven	01
		KBR pallet maker for FTIR measurement.	01
		Gas Sensor System	01
		PVD Chamber	01
		Autoclave	01
		Dessicator	03
		Depth Coater	01
		Ball Milling System	01
<b>14.</b>	<b>MEMS &amp; NEMS Lab</b>	Analog Digital Scope (ADS) HM507, HAMEG Instruments, 50 MHz 100MS/s.	01
		Digital Oscilloscope (Yokogawa) DL9040 5GS/s 500 MHz.	01
		Function Generator (Agilent) 33120A 15MHz	01
		Universal Counter (Agilent) 53131A 225 MHz	01
		Multifunction Generator (Caddo) 4080 20 MHz	01
		Triple Power Supply (Scientech) ST4071 5V/30V	01
		Multiple Power Supply (Scientech) ST4077	01
		Dessicator	02
		Refrigerator	01
		Signal generator (Agilent), 3GHz N9310A	01
		Hot plate	01

<b>15.</b>	<b>Thin Film and Micro Fluidics Lab</b>	High end upright microscope	01
		Thermal stage	01
		High speed camera	01
		High speed camera	01
		UV-Ozone cleaning unit	01
		Spin coater	02
		Fume chamber	01
		Clean bench	01
		Ultrasonic cleaning bath	01
		Millipore water supply unit	01
		AC/DC power supply units	03
		Electromagnet with Gaussmeter	01
		Microbalance	01
		High speed centrifuge	01
		Air furnace	01
High resolution camera	01		
Vacuum furnace	01		
High Speed computational servers loaded with software, which includes Ansys Fluent, Mathematica and Material Studio	01		
<b>16.</b>	<b>Micro-Nanoelectronic Characterization Lab</b>	Oxidation Diffusion Furnace	01
		Wet Bench	01



		DI water system	01
		Analytical Balance	01
		Ultra-filtration unit	01
		UV Ozone	01
		Hot plate	01
		Sonicator	01
		Refrigerator	01
<b>17.</b>	<b>Chem Dist Lab</b>	Electrochemical Potentiostat	01
		Scanning Probe Microscope: Veeco (Model)	01
		Gas Chromatograph (Centurian Scientific)	01
		Rotavapor	01
<b>18.</b>	<b>Analytical Lab for Characterization and Testing</b>	These laboratories are functional and operational	-
<b>19.</b>	<b>Data Science Lab</b>		-
<b>20.</b>	<b>Nanocatalysis Lab</b>		-
<b>21.</b>	<b>Nanobiotech Lab</b>		

## MAJOR EQUIPMENT AND FACILITIES ACQUIRED

### Equipment

1. Ag hot & Cold RO + UV Water Dispenser
2. Ironil PF Set
3. RT30C3032GS/HL Samsung Refrigerator
4. Automatic Fire Extinguisher capacity 5KG
5. Dry Powder Fire Extinguisher (ABC Type)
6. Clean Agent Based Portable (Stored Pressure Type) Fire Extinguisher of 2 kg capacity
7. Frontec 32 inch LED Monitor

8. TV Stand
9. Desktop PC
10. 2x2 Matrix Switcher 4k HDMI Matrix Switch 2x2/ Wireless HDMI transmitter/ Wireless HDMI Receiver/ HDMI 4k 1.5 mtr, HDMI 1.4 V
11. Electrochemical Workstation

#### **Facilities:**

1. ISO 5 and 6 Clean Rooms
2. SWASTHA labs
3. Optical Characterization Lab
4. Materials Characterization Lab
5. Electrical Characterization Lab
6. ICMR labs
7. Chem Dist Lab
8. Cell Culture Lab
9. Analytical Lab for Characterization and Testing
10. Data Science Lab
11. Nanocatalysis Lab
12. Nanobiotech Lab

#### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

The Centre is pursuing research in the multi-disciplinary area of Nanotechnology required to meet the future challenges and to augment academic partnerships with industry.

The major projects sanctioned at the Centre are being implemented at the Centre with experts from multi-disciplinary areas of science and engineering:

1. SWASTHA – Smart Wearable Advanced nanoSensing Technologies in Healthcare ASICs, 5(1)/2022– NANO, MeitY (4200 L).
2. Centre for Excellence in Disruptive Innovations & Product Development for Affordable Rural Healthcare, 5/3/8/20/2019-ITR, ICMR (1506 L)
3. Indian Nanoelectronics Users’ Programme - Idea to Innovation (INUP-i2i), 5(1)/2021-NANO, MeitY, 2021-2024 (923 L).
4. Healthcare Bio-Entrepreneurship Ecosystem Encompassing Biomaterials, Industrial Biotechnology and Diagnostics, BT/BIRAC/BI-IITG/2020, BIRAC, 2021 (498 L)
5. DNA Aptasensor-Nanomaterial based product development and commercialization for application in Diagnostics and Environment Monitoring, DBT, BT/PR41254/ATGC/127/86/2020, (29.88 L)

Another major research project of Rs. 57.75 Crore sanctioned from DeitY implemented at the Centre helped in establishing a ‘Centre for Excellence in Research and Development of Nanoelectronic Theranostic Devices’.

The major areas of research and development are as follows:

**Nano-Electronics group** focuses on Micro-Nano fabrication, Optical and Electronic Characterization of Micro-Nano Devices, development of SAW sensors, ECG amplifier and blind assisted walker, Memory and computing technology, Semiconductor and quantum materials technology, Spintronics.

**Nanoscale science and technology group** is working in the broad areas of nanoscale science and technology involving synthesis, reaction and organization of nanoscale materials and their application in problems related to Chemistry and Biology.

**Nanobiotechnology group** is pursuing interdisciplinary collaborative research at the Centre for Nanotechnology on “nanoparticles and nanocomposites”. They are developing new nanoclusters for the potential applications as sensors, antimicrobial and anticancer agents and has demonstrated the signaling events in co-targeting triple negative breast cancer cells, movement of hydrogel in constricted microchannel and drug resistant behavior of EMT cells during deformation, Multifaceted approach in cancer therapeutics which encompasses Drug Repurposing, Nanotheranostics and targeting EMT Dynamics In addition, quercetin loaded luminescent hydroxyapatite nanoparticles have been developed in cancer therapeutics. In device front, our collaborative work on development of FET-based POC devices is being persuaded.

**Nanophysics group** is working on the various aspects on the defects of carbon nanotube and their possible application as sensor, Condensed Matter Physics; High-k and low loss materials, Ferroelectrics Ceramics, Oxide thin films Nanomaterials. They have developed a device for ‘Low temperate microwave sintered phase pure AlN ceramics comprising rare earth oxide additives.

**Micro and Nano Fluidics group** is working in the areas of Micro/nano Mechanics of Soft Matter, Rheology of Viscoelastic Materials, Liquid Crystals, and Smart Materials, Intermolecular forces, Colloids and Interfacial science, Micro/Nano Fluidics, Electro- and Magneto-hydrodynamics, Electrokinetics, Self-Organized Solar Cells and Light Emitting Devices, Advanced Flow Microreactors for Artificial Photosynthesis, Hydrogen Production, Bio-Synthesis, and CO<sub>2</sub> sequestration, Synthesis and Applications of micro/nano Robots, MEMS Theranostic devices and Point-of-Care-Testing Health Care Devices. They have recently developed device for ‘POC detection of oleophilic biomarkers in hydrophilic analytes’; ‘POCT Device to Detect Cervical Cancer Specific Biomarker’; ‘A Point-of-Care system to Detect Rest Tremors of Human Limb’; ‘Portable Modular Colorimetric Device’

**Organometallics and Catalysis group** focuses on Organometallics, Catalysis and Organofluorine Chemistry, Heterogeneous Catalysis and reaction engineering, Biomass conversion to value added chemicals, Bio-oil up-gradation to transportation fuels, Carbon dioxide activation to valuable chemicals, Metal encapsulated zeolites. They have developed a process for ‘Upgradation of ethanol or alkylation of alcohols’.

**Tissue Engineering, Biomaterials, Stem Cells and Regenerative Medicine group** have developed devices for ‘Antimicrobial coatings and preparation process thereof’; ‘Hemostatic silk fibroin composite powder’; ‘Silk-Liver ECM composite for bioartificial liver’.

**Bio-inspired Polymer Materials, Drug Delivery, Open Microfluidics, Chemical Sensor group** have developed methods for ‘A coating composition and a process of preparation thereof and ‘A Method of Preparing Disposable Water Repellent Mask and a Product Thereof’.

A group of faculty members are working on **Organic light emitting diode (OLEDs), Conjugated oligomer and polymer synthesis, Organic Field Effect Transistors (OFETs), Organic Solar Cells (OSCs)**. Besides manpower training and basic research, the centre aim to develop sensors and Transfer of Technology (ToT) to the Start-Up companies. In addition, Centre is also involved in fostering growth of science and education in the north east in the field of nanotechnology by conference, workshops, symposium and seminars.

#### **MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT**

- Comprehensive *in-silico* and *in-vitro* studies identified potential repurposed drugs for breast cancer therapy.
- Co-therapeutic modules were developed to target multiple signaling pathways in triple negative breast cancer (TNBC) cells.
- Recombinant proteins were discovered to possess anti-neoplastic properties and modulate cancer cell signaling.
- Suitable drug delivery vehicles were established to target the tumor microenvironment of metastatic TNBC cells for enhancing drug susceptibility.

**CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

<b>Sl. No.</b>	<b>Name of Faculty</b>	<b>Name of Conf./Workshop</b>	<b>Place</b>	<b>Date</b>	<b>International/ National</b>
1.	Prof. Dipankar Bandyopadhyay	Multiphase Systems under Electric Field: from 'Kissing' to 'Threading',	University of Bordeaux	June 2023	International
2.	Prof. Dipankar Bandyopadhyay	Laws and Limits, Research Conclave	IIT Guwahati,	May 2023	National
3.	Prof. Dipankar Bandyopadhyay	Evidence Based 'Precision' Healthcare	IIT Kanpur	March 2023	National
4.	Dr. Akshai Kumar A S	Symposium on Physics and Engineering in Medical Sciences	Christian Institute of Health Sciences and Research (CIHSR), Dimapur	23/03/2024	National
5.	Dr. Akshai Kumar A S	International Conference on Catalysis (IC2-2024)	Organised by School of Chemistry, IACS Kolkata	11-13/03/2024	International
6.	Dr. Akshai Kumar A S	Emerging Trends in Catalysis and Synthesis (ETCS-2024)	Organised by Department of Chemistry, IIT Kharagpur	07-09/03/2024	International
7.	Dr. Akshai Kumar A S	4th Frontier Symposium in Chemistry 2024 (FS-CHM-2024)	Organised by School of Chemistry, IISER Thiruvananthapuram	19-21/01/2024	International
8.	Dr. Akshai Kumar A S	3rd Main-group Molecules to Materials (MMM-III)	Organized by IIT Hyderabad	9-12/12/2023	International
9.	Dr. Akshai Kumar A S	20th International Conference on Modern Trends in Inorganic Chemistry (MTIC-XX)	IISc Bangalore	13-15/12/2023	International
10.	Dr. Akshai Kumar A S	International Conference on Organometallics and Catalysis 2023	The Zuri White Sands, Goa Resort & Casino organized by IISER Kolkata, IIT Bombay and IISc Bangalore	30/10/2023 to 01/11/2023	International
11.	Dr. Akshai Kumar A S	Science and Technology for Sustainable Future	Organized by Indian National Young Academy of Sciences (INYAS) in association with IIT(ISM) Dhanbad	15-17/09/2023	International

12.	Dr. Akshai Kumar A S	World Environment Day # Beat Plastic Pollution	Organized by INYAS in collaboration with Cotton University	05/06/2023	National
13.	Dr. Akshai Kumar A S	Research and Industrial Conclave - 2023	IIT Guwahati	14-16/05/2023	National
14.	Prof. Roy Paily Palathinkal	Semiconductor Industry of the Future	Viksit Bharat Western zone workshop - Thriving and Sustainable Economy, Datta Meghe Institute of Higher Education & Research	Nagpur (online)	30th March 2024
15.	Prof. Roy Paily Palathinkal	Opportunities in the Semiconductor Sector	Online Seminar at, IndiasTechade: Chips for Viksit Bharat	NIT Agartala (online)	13th March 2024
16.	Prof. Roy Paily Palathinkal	Developments in Semiconductor Technology and Applications	Semiconductor at IIT Guwahati, IndiasTechade: Chips for Viksit Bharat	IIT Guwahati	13th March 2024
17.	Prof. Roy Paily Palathinkal	Devices for the Detection of Breath Components	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	IIT Guwahati	14 February 2024
18.	Prof. Roy Paily Palathinkal	Sensors for the Detection of Breath Components	International Conference on Devices, Sensors and Systems (CoDSS), ECE Department	Tezpur University	11 February 2024
19.	Prof. Roy Paily Palathinkal	Magnetic and Semiconductor Devices for the Analysis of Breath Gas Components	The XXII International Workshop on the Physics of Semiconductor Devices (IWPSD 2023)	IIT Madras	16 December 2023
20.	Prof. Roy Paily Palathinkal	Sensitive Detection of Biological Matter using FET	10th International Conference on Microelectronics Circuits and Systems, Micro2023	Guwahati	1 July 2023
21.	Prof. Roy Paily Palathinkal	Selective adhesion on FET for Biosensing Applications	Professor R M Sethunayanan Endowment Lecture,	Annamalai University	13 April 2023

**INVITED LECTURES OF FACULTY: IN INDIA, ABROAD**

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1.	Dr. Akshai Kumar A S	Portable Energy Devices for Powering Rural Health Care Appliances	Symposium on Physics and Engineering in Medical Sciences organized by Christian Institute of Health Sciences and Research (CIHSR), Dimapur	Dimapur, Nagaland	23/03/2024
2.	Dr. Akshai Kumar A S	Base Metal Catalysis for Generation of Hydrogen, Fuel & Specialty Chemicals	International Conference on Catalysis (IC2-2024) Organised by School of Chemistry, IACS Kolkata	Kolkata, WB	11/03/2024 - 13/03/2024
3.	Dr. Akshai Kumar A S	Base Metal Catalysis for Generation of Hydrogen, Fuel & Specialty Chemicals	Emerging Trends in Catalysis and Synthesis (ETCS-2024) Organised by Department of Chemistry, IIT Kharagpur	Kharagpur, WB	07/03/2024 - 09/03/2024
4.	Dr. Akshai Kumar A S	Pincer-Metal Catalyzed C-H Activation Reactions: Synthesis of Hydrogen, High Value Fuels and Specialty/Value-Added Chemicals	4 <sup>th</sup> Frontier Symposium in Chemistry 2024 (FS-CHM-2024) Organised by School of Chemistry, IISER Thiruvananthapuram	Thiruvananthapuram, Kerala	19/01/2024 - 21/01/2024
5.	Dr. Akshai Kumar A S	Teaching Old Reagents New Reactions: Base Metal Catalysis for Generation of Hydrogen, Fuel and Specialty Chemicals	organized by the Chemical Society of Mangalore University	Mangalore University, Karnataka	21/12/2023
6.	Dr. Akshai Kumar A S	Teaching Old Reagents New Reactions: Base Metal Catalysis for Generation of Hydrogen, Fuel and Specialty Chemicals	3rd Main-group Molecules to Materials (MMM-III) Organized by IIT Hyderabad	Hyderabad, Telangana	9-12/12/2023
7.	Dr. Akshai Kumar A S	Organometallic Catalysis for Production of Hydrogen, Biofuels and Specialty Chemicals	International Conference on Organometallics and Catalysis 2023	The Zuri White Sands, Goa Resort & Casino organized by IISER Kolkata, IIT Bombay and IISc Bangalore	30/10/2023 to 01/11/2023

8.	Dr. Akshai Kumar A S	Catalysis for Generation of Hydrogen and Fuel Chemicals	Science and Technology for Sustainable Future Organized by Indian National Young Academy of Sciences (INYAS) in association with IIT(ISM) Dhanbad	Dhanbad, Bihar	15-17/09/2023
9.	Dr. Akshai Kumar A S	Organometallic Catalysis for Production of Hydrogen Biofuels and Specialty Chemicals	Special Lecture at Organic Chemistry Department, IISc Bangalore	Bangalore, India	11/07/2023
10.	Dr. Akshai Kumar A S	Organometallics in Catalytic Conversions: Synthesis of Hydrogen, High Value Fuels and Specialty/Value-Added Chemicals	ChemDist Invited Talk Series on New Generation Technologies	Pune, India	19/06/2023
11.	Dr. Akshai Kumar A S	Solutions to Plastic Pollution	World Environment Day # Beat Plastic Pollution Organized by INYAS in collaboration with Cotton University	Guwahati, Assam	05/06/2023
12.	Dr. Akshai Kumar A S	Organometallics Catalyzed Production of Hydrogen, Biofuels and Specialty Chemicals	Research and Industrial Conclave – 2023 organized by IIT Guwahati	Guwahati	14-16/05/2023
13.	Dr. Tanmay Dutta	Device Characterization and Testing	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati, Assam	12/12/2024
14.	Dr. Tanmay Dutta	Challenges and Future Directions of Electronic Devices considering ethical and environmental aspects	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati, Assam	12/12/2024
15.	Dr. Tanmay Dutta	Spintronic and Quantum Devices	Assam Engineering College (AEC)- Faculty Development Programme	Guwahati, Assam	10/12/2024
16.	Dr. Tanmay Dutta	World of Spin and Memory Devices	Indian Nanoelectronics User's Programme (INUP) 2023, IIT Guwahati	Guwahati, Assam	08/12/2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
1	Shri. S. Krishnan	MeitY Secretary, GoI	Inauguration of SWASTHA and Cleanroom	08/02/2024-09/02/2024	OK
2	Dr. Shubham Sahay	Indian Institute of Technology Kanpur	Research Collaboration/	07/02/2024	OK

			Energy-efficient Computing Platforms and Hardware Security Primitives		
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#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1.	Prof. Siddhartha S. Ghosh (Chairperson) Dr. Akshai Kumar & Dr. Tanmay Dutta (Convener)	ICANN 2023	MeitY	29/11/2023 to 01/12/2023	International	500
2.	Dr. Akshai Kumar A. S.	Stage 1: Essay Competition, Stage 2: Debate Competition and Stage 3: Elocution Competition conducted under Model G20 Initiative in association with Ministry of Education Organized by IIT Hyderabad & INYAS	MoE	01/07/2023	International	50
3.	Dr. Arun Tej Mallajosyula	INUP-i2i Offline Familiarization Workshop on Nanoelectronics: Fabrication and Characterization	MeitY, GoI	25-27/04/2023	National	53
4.	Dr. Arun Tej Mallajosyula	INUP-i2i Hands-on Training on Fabrication and Characterization of Nanoelectronic Devices	MeitY, GoI	02-11/06/2023	National	36
5.	Dr. Arun Tej Mallajosyula	INUP-i2i Online Familiarization Workshop on Nano and Quantum Materials & Devices: Fabrication and Characterization	MeitY, GoI	06-08/12/2023	National	372
6.	Dr. Arun Tej Mallajosyula	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	MeitY, GoI	14-16/02/2024	National	514

#### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
1.	S. Akshai Kumar A.	Ph.D. (IISc Bangalore)	Head, Centre for Nanotechnology, Associate Professor Dept. of Chemistry & Centre for Nanotechnology	Organometallic Chemistry, Inorganic Chemistry, Organofluorine Chemistry, Catalysis (Homogeneous and Heterogeneous), C-H and C-F activation



2.	Bandyopadhyay, Dipankar	Ph. D (IIT Kanpur)	Head, Centre for Nanotechnology Professor Department of Chemical Engineering	Colloid and Interfacial Phenomena, Computational Fluid Dynamics, Micro and Nano fluidics, Complex Flow and Fluids
3.	Bose, Biplab	Ph. D (AIIMS)	Associate Professor Department of Biosciences and Bioengineering	Molecular Networks, Recombinant Proteins
4.	Bag, Ankush	Ph. D (IIT Kharagpur)	Assistant Professor Department of Electronics and Communication Engineering	Growth, fabrication and modelling of gallium oxide based power devices such as Schottky barrier diodes, MOSFETs
5.	Chattopadhyay, Arun	PhD (Columbia University)	Professor Department of Chemistry	Nanoscale Science & Technology
6.	Dasmahapatra Ashok Kumar	PhD (Indian Institute of Technology Bombay)	Associate Professor Dept. of Chemical Engg & Centre for Nanotechnology	Complex Fluids, Phase transition in polymeric system, Self assembly in block copolymer, Structure Property relation, Biophysics, Graphene based nano materials, Solar cells.
7.	Dutta, Tanmay	Ph.D (National University of Singapore)	Assistant Professor Department of Electronics and Communication Engineering	Non-volatile memory, Spintronics, MRAM (SOT, STT), Race-track memory, HDD (Hard disk drives), SSD (Solid state drives), Quantum computing, Neuromorphic memory
8.	Ghosh, Siddhartha Sankar	PhD (IICB, Kolkata)	Professor Department of Biosciences and Bioengineering	Gene Therapy, Nanobiotechnology
9.	Giri, Pravat Kumar	PhD (IIT Kanpur)	Professor Department of Physics	Condensed Matter Physics; Semiconductor nanostructures, Ion-solid interactions, Optoelectronic materials & devices, Nanotechnology
10.	Iyer, Parameswar Krishnan	Ph.D. (CSMCRI, Bhavnagar)	Professor Department of Chemistry	Organic and Polymer synthesis, Bio & Chemosensors, Optoelectronic devices.
11.	Mandal, Tapas K	Ph. D (IIT Kharagpur)	Professor Department of Chemical Engineering	Multiphase flow & Measurement in multiphase flow, Bio-diesel.
12.	Mandal, Biman B	IIT Kharagpur	Professor	Regenerative Medicine, Biomaterials, Tissue Engineering, Stem Cells.
13.	Manna, Uttam	Indian Institute of Science, Bangalore	Associate Professor	Bio-inspired polymeric materials
14.	Nemade, Harshal B.	PhD (IIT Bombay)	Professor Department of Electronics and	Electronic and Ultrasonic instrumentation, Electronic product design, EMI/EMC issues, Acoustic

			Communication Engineering	sensors, SAW devices, MEMS, NEMS
15.	Palathinkal, Roy Paily	Ph. D. (IIT Madras)	Professor Department of Electronics and Communication Engineering	VLSI and MEMS
16.	Pattader, Partho Sarathi Gooh	PhD (Lehigh University, USA)	Assistant Professor Dept. of Chemical Engg. & Centre for Nanotechnology	Stochastic dynamics, Colloid and Interface science, Tribology, Soft matter
17.	Pamu, D.	Ph. D. (Univ. of Hyderabad)	Associate Professor Dept. of Physics & Centre for Nanotechnology	Condensed Matter Physics; High-k and low loss materials, Ferroelectrics Ceramics, Oxide thin films Nanomaterials
18.	Paul, Anumita	Ph.D. (Columbia University)	Professor Department of Chemistry	Surface Science, Catalysis, Thin Films.
19.	Peela, Nageswara Rao	PhD (Indian Institute of Technology, Kanpur)	Associate Professor Dept. of Chemical & Centre for Nanotechnology	Heterogeneous Catalysis and reaction engineering, Biomass conversion to value added chemicals, Bio-oil up-gradation to transportation fuels, Carbon dioxide activation to valuable chemicals, Metal encapsulated zeolites
20.	Sahoo, Lingaraj	Ph.D (MDU, Rohtak)	Professor Department of Biosciences and Bioengineering	Genetic engineering and functional genomics of plants
21.	Mallajosyula, Arun Tej	Ph.D. (IIT Kanpur, India)	Assistant Professor Dept. of Electronics and Electrical Engineering	<i>Photovoltaics, Organic Electronics, Flexible Electronics</i>

**Centre for Linguistic Science and Technology**

**YEAR OF ESTABLISHMENT OF THE CENTRE:** 2014

**ACADEMIC PROGRAMMES OFFERED:** PhD

### LABORATORY FACILITIES

- **Research Scholar Bay:** It houses all the research scholars of the Centre, with individual workspaces.
- **High Performance Computing lab:** This lab hosts high CPU and GPU servers to support research scholars of the Centre for their computing intensive experiments
- **Project Lab:** It houses sponsored projects and specialized equipment of the Centre.

### MAJOR EQUIPMENT AND FACILITIES ACQUIRED

Sl No.	Item	Qty	Price
1	Network Address Storage Hard Drive Make: Samsung, Model: 870 QVO SATA	03 Nos.	144963.00
2	Workstation for Eyetracker Make: HP, Model: Z1 Tower G9	01 No.	230100.00
3	3 x 1.92TB 6GBPS 2.5inch SATA SSD Make: HPE	03 Nos.	169920.00
4	2 x 1.92TB 6GBPS 2.5inch SATA SSD HPE	02 Nos.	110920.00
5	High end Graphics Card Make: Nvidia, Model: RTX A4500	02 Nos.	353410.00

### MAJOR AREAS OF RESEARCH AND DEVELOPMENT

- Spoken Language Technology Development:
  - Automatic Speech Recognition, Text to Speech, Acoustic analysis, Human centered design of Interactive systems
- Text Processing and Analytics:
  - Natural Language Processing, Sentiment Analysis, Machine Translation/Transliteration, Event Detection
- Brain, Cognition and Language:
  - Cognitive Linguistics, Evoke Related Potential, Eye Tracking
- Image and Video Processing :
  - Image Processing, Video Captioning
- Computational Phonology
- Natural User Interface
  - UI, XR/VR, Language Structure and Environment

### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
01	Dr. Prithwijit Guha	8th International Conference on Computer Vision and Image Processing (CVIP 2023)	IIT Jammu	03/11/2023	International
02	Dr. Prithwijit Guha	10th International Conference on Pattern Recognition and	ISI Kolkata	12/12/2023 – 15/12/2023	International

		Machine Intelligence (PREMI 2023)			
03	Dr. Prithwjit Guha	The 14th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2023)	IIT Ropar	15/12/2023 – 17/12/2023	International
04	Prof. Rohit Sinha	26th International Conference on Oriental – COCODA	COCOSDA 2023	4-6/12/2023	International
05	Prof. Ranbir Singh Sanasam	Pacific Asia Conference on Language, Information and Computation (PACLIC 2023)	HongKong University	2-3/12/2023	International

### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Dr. Prithwjit Guha	Artificial Neural Networks, Decision Trees and Random Forests, Summer School on Machine Learning & Deep Learning Techniques,	TIH, IIT Guwahati,	IITG	26/06/2023 – 07/07/2023.
02	Dr. Prithwjit Guha	Applications of AI	EICT Academy, IIT Guwahati	IITG	7/8/2023
03	Dr. Prithwjit Guha	Lightweight Networks for Computer Vision Systems	(Indo-German Bi-lateral Workshop (More than Moore Integration of sensing and Artificial Intelligence on a chip)	IIT Bhilai,	16/02/2024
04	Dr. Prithwjit Guha	Lightweight Networks for Face Analytics	IEEE Mathworks Joint Workshop	Guwahati	28/02/2024
05	Dr. Prithwjit Guha	Interacting with Scenes: A Joint Vision-Language Task	Recent Trends of Research in Computer Vision	CIT Kokrajhar	11/03/2024
06	Dr. Prithwjit Guha	Visual Question Answering with Dual Attention and Question Categorization	International Conference on Data Driven AI	Kaziranga University, Jorhat	Kaziranga University, Jorhat
07	Prof. Rohit Sinha	Machine Learning for Speech Processing: A Deep Learning Perspective	COCOSDA 2023	Indira Gandhi Delhi Technical University for Women	4/1/2024
08	Prof. Ranbir Singh Sanasam	Deep Learning Methods for Detecting Incongruent News	Xavier International Conference on Artificial Intelligence (XICAI 2024)	XIM	29/01/2024
09	Prof. Ranbir Singh Sanasam	Fundamentals of Data Science	GU	GU	11/3/2024
10	Prof. Ranbir Singh Sanasam	Social Media Data Mining	MZU	MZU	12/8/2023

## VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Prof. SIMON ROBINSON	Swansea University.	Unmute Toolkit Launch Workshop	05/0/2024	Interaction with CLST Faculty Members
	Prof. Niladri Shekhar Das	ISI Kolkata	Machine Learning for NLP	28/04/2023	Lecture
	Dr. Bidyut Kr. Patra	IIT BHU	Interaction	5/6/2023	Interaction with CLST Faculty Members

## SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Dr. Abhishek Srivastava	Unmute Toolkit Launch	EPSRC	05/01/2024	International	50+
02	Prof. Bidisha Som	iBrain lecture series 1	EU	26/8/2023	International	50+
03	Prof. Bidisha Som	iBrain lecture series 2	EU	20/9/2023	International	50+
04	Prof. Bidisha Som	iBrain lecture series 3	EU	4/11/2023	International	50+
05	Prof. Bidisha Som	Application of Eye-tracking in Cognitive Science research	EU	5/8/2023	International	100+
06	Prof. Bidisha Som	Basic Statistics: Analysis and Interpretation	EU	7/10/2023-8/10/2023	International	100+

## STUDENTS' ACHIEVEMENTS

- Ms. Chandni Khaund: Kuppuraj-Bishop Study Visit Grant; Experimental Psychology Society (EPS) of UK.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/ Org PhD degree received from	Designation	Areas of Interest
1	Prof. Sukumar Nandi	IIT Kharagpur	Professor	Networks (Specially: QoS, Wireless Networks), Computer and Network Security, VLSI, Computational Intelligence
2	Prof. Bidisha Som	JNU New Delhi	Professor	Cognitive mechanisms of language structure and use.
3	Prof. Manas Kamal Bhuyan	IIT Guwahati	Professor	Image & Video Processing, Computer Vision, Machine Learning & Human Computer Interactions (HCI), Virtual

				Reality & Augmented Reality, Biomedical Signal Processing.
4	Dr. Prithwjit Guha	IIT Kharagpur	Assoc. Professor	Computer Vision, Pattern Recognition, Signal Processing, Robotics.
5	Prof. Sanasan Ranbir Singh	IIT Madras	Professor	Open Source Intelligence (Social Media/Social Network Analysis), Information Retrieval, NLP
6	Dr. Samit Bhattacharya	IIT Kharagpur	Assoc. Professor	Human Computer Interaction, User Modeling, Model Based Evaluation of Interactive Systems, Rehabilitation Engineering
7	Prof. Shakuntala Mahanta	Utrecht University, Netherlands	Professor	Theoretical phonology, acoustic phonetics, tone and intonation, perception
8	Prof. D Udaya Kumar	IIT Bombay	Professor	Visual Communication, Graphic Design, Typography, Information Graphics, Architecture, Design Education and Research
9	Prof. Priyankoo Sarmah	University of Florida	Professor	Phonetics, Tones, Computational Linguistics
10	Prof. Rohit Sinha	IIT Kanpur	Professor	Speech and Audio Processing, Speech Recognition, Signal Processing
11	Prof. Samarendra Dandapat	IIT Kanpur	Professor	Signal Processing, Machine Learning, Cardiovascular Signal Processing, Speech Processing (Stressed Speech), Biomedical Data Science, AI in Healthcare, Retinal Image Processing (Fundus Image).
12	Dr. Suresh Sundaram	IISc Bangalore	Assoc. Professor	Pattern recognition, Image/ Video Processing and Computer Vision.
13	Dr. Abhishek Shrivastava	IIT Bombay	Asstt. Professor	Interaction Design, Speech User Interfaces and Multimodal Interface Design, Design for Development, New Media, Graphic Design and Cartooning.
14	Prof. S M Hazarika	University of Leeds, England	Professor	Cognitive Systems   Knowledge Representation and Reasoning   Artificial Intelligence   Biomimetic Robotics   Machine Learning   Robotic Neuro rehabilitation
15	Dr. Navin Gupta	University of Essex, UK	Asstt Professor	Imaging Genetics, Biomedical Signal/Image Processing, Multimodal Analysis, Computer Aided Diagnosis, Biomedical Instrumentation
16	Dr. Neeraj Kumar Sarmah	IISc Bangalore	Asstt. Professor	Bio-acoustics, health-acoustics, speech & audio; Brain-informed signal processing (behavioral and EEG data capture and analysis); AI for perception and cognition; Non-stationary time-series signal modelling (sampling and time-frequency analysis).
17	Prof. Ashish Anand	Nanyang Technological University, Singapore	Professor	NLP, Clinical Text Mining, Machine Learning and its application in computational biology, Deep Learning

## Computer & Communication Centre



## **Computer & Communication Centre:**

The Computer and Communication Centre (CCC) of IIT Guwahati is the central computing resource pool of the Institute. CCC is responsible for:

- Providing Email service and Internet connectivity to the institute
- Catering to the general-purpose and high-performance computing needs of the users
- Maintenance of the campus network
- Hosting and maintenance of Institute's Intranet web pages
- Providing Office Automation services

CCC has been involved in the development of several in-house software packages. It provides assistance to other academic institutes of the North-East region of India. It conducts summer training programmes for students from the various institutes of the region.

The computer lab of CCC is equipped with PCs of the latest configurations so as to cater to the needs of the IITG community. The lab remains open for 16 hours in a day during which it is accessible to all authorized users of the Institute. Additionally, the lab stays open for 24 hours during the mid and end semester examinations. Computer practical classes for the common courses are held in the lab. The computer lab facilities are also extended to students of other institutes. The resources of CCC are constantly upgraded to meet the ever evolving standards of Information Technology.

CCC provides and maintains the PCs of the faculty and staff members of the Institute. In addition to providing direct support to the members of the Institute, CCC also frequently adds to its write-ups (HOW-TOs, FAQs etc.) on its Intranet website. It also maintains an online e-Noticeboard for posting and viewing notices electronically campus-wide, a web-based Complaint Management Information System etc.

## **MAJOR FACILITIES AND EQUIPMENT**

### **Email service:**

IIT Guwahati has been using Microsoft Office 365 platform for providing email service to all student, faculty, staff and alumni. Microsoft Office 365 provides 50 GB email storage, and 1TB OneDrive storage per user along with access to a host of other applications. The users by and large are happy with the email service along with several applications that it provides. Microsoft Teams and Stream have proved to be very handy tools for both Academic and Official purposes.

The email service of all project staff working in different sponsored projects are provided in G-Suite platform under sub-domains “rnd.iitg.ac.in”, “iisi.iitg.ac.in” and tih.iitg.ac.in”. This year we have provided the email service along with other applications in Microsoft Office 365 platform to the newly introduced Online BSc program by Mehta Family School of Data Science & AI under the sub-domain “op.iitg.ac.in”.

### **The HPC Facility:**

Computer and Communication Centre provides high-performance computing facilities to all faculties, students, and staff of IIT Guwahati, as well as researchers of various Academic and Research institutes across India. Currently CCC have two High Performance Computing clusters. Param-Kamrupa and Param-Ishan.

PARAM Kamrupa, a state-of-the-art supercomputing system is a supercomputing facility established under Phase-2 of build approach of National Supercomputing Mission with a peak computing power of 838 TF with 1 PB storage.

This facility is also set up as a joint project between IIT Guwahati and CDAC. This cluster will have **146 CPU-only** computing nodes and 10 GPU nodes with 2 **NVIDIA V100 GPU** cards per node. Each node has 48 CPU cores and 192GB of RAM. Total memory of the cluster is 52 TB. This system has the flexibility to add another **64 GPU cards** if needed in future. Param-Kamrupa was inaugurated by the Honourable President of India on 13<sup>th</sup> October 2022. Currently, more than 250 users are active in the system. Total 44 hours of downtime taken in the year of 2023. Total cluster utilization is more than 75%.

PARAM-ISHAN, the 250 TF peak-computing-performance supercomputing facility consists of 126 Compute Nodes without Accelerator, 04 nodes of High Memory Compute Nodes without Accelerator, 16 compute nodes with GPU and 16 Compute Nodes with Xeon Phi.

Around 500 users (including Faculty, research scholars, students and researchers from outside IIT Guwahati) are currently working on the system. This year we have added 250 new users. Around 75% utilization of the total computing power has been observed during the year. A total of four down-times were taken this year, amounting to a net down-time of at most 35 hours.

### **Computer Network Enhancement**

CCC is responsible for providing network connectivity to the upcoming hostels/buildings and reinforcing the existing network infrastructure. This year CCC has extended the network connectivity to the new Gaurang and Dikhow hostel. To cater the ever-increasing network requirements, CCC has procured 60 nos. of HPE Aruba L2+ network switches consisting of both 24-port and 48-port specifications. These switches are being installed in new buildings and replaced against some faulty switches in hostels and other areas. This year we have also procured and installed several Fibre passive components like Fibre LIU, Fibre patch cords, UTP patch cords, Fibre SFP modules, etc. for day-to-day maintenance of network infrastructure of IIT Guwahati. Apart from the above-mentioned activities, some renewals of AMCs of various devices like ASR-100X router, FMS (Facility Management Services), etc. has been done this year.

To extend seamless Wi-Fi connectivity across the academic building, Core 5 and open areas in front of Auditorium, CCC has procured both indoor and outdoor Wi-Fi Access Points and other related accessories. Installation of this setup is currently in progress.

### **Expansion of the existing BSNL EPABX system:**

With the expansion of the campus, the Computer Centre has increased the capability of the existing BSNL EPABX system and extended its telephone network to new offices and expansion wings of the institute.

This year the centre has additionally procured 160 nos. of FTTH modem which shall be distributed for residential quarters for new allottees.

### **Office Automation Services:**

CCC has been involved in the development of several in-house software packages for providing services to the Institute's various office automation related works. The primary aim was to develop appropriate software which can be used in the functional areas of the Institute to automate the processes to increase efficiency. All the applications have been developed in-house and efforts are still on to facilitate all the current and future official needs of various Departments/Sections/Centres/Schools of the Institute to proceed towards a fully digital environment in the Institute campus. These applications include IITG Recruitment, Staff Administration, Faculty Administration, Payroll System, PDA Application, PF Application, Student Profile, Faculty Leave System, Staff Leave System, Student Affairs, e-Payment Application, ID Card Application, MCM Scholarship, Gymkhana Application, Faculty Recruitment Application, GMIS Application, Sports Recruitment, Library Trainee Recruitment, CCC Trainee Recruitment, Automation Recruitment, Stock Management, Sishugram Voluntary Donation, Electricity Billing System, No-Dues Application for Staff and Faculty, Telephone Bill Reimbursement, Record Archival and Management System,

Instrument Booking System, Hostel IP Calculator, Voluntary Donation, MTech Project Allotment, Budget and Purchase System, APAR Application, Central Application Portal (CAP), Central Authentication System (CAS), Library Vendor Registration, BSBE Departmental Library, IIT Club Contribution portal, GTIS Application, Automation Website, Faculty Forum Contribution, Registrar recruitment, Institute Engineer recruitment, Temporary or Contractual staff recruitment, Share management system for employees' co-operative society, CCC no-dues, Internship application system, Room booking system, Alumni meet website and Registration portal, Administrative module for Active Directory user management, Authentication service module for external applications, Administrative module for central application portal, Internal complaint portal for girls, Telemedicine portal and IPM Portal.

This year, the centre was involved in the development of many new applications like - SA Portal, Establishment Portal, NSS Portal, AER Portal, File Tracking System, Room Booking System for EEE Department and Internship Portal for Civil Department. We have also integrated various add on features to many of the existing applications like - Payroll, E-payment, Staff/Faculty Administration, Online Leave, Recruitment, APAR, Student Affairs' Automation, Registrar Recruitment etc. This year, we have also migrated various individual application's theme to our common ERP theme.

The centre is also responsible for managing user accounts and providing authentication service to IITG users for accessing the in-house ERP application, Internet (through LAN, WiFi), EDUROAM campus connect, VPN and various departmental applications. Currently, there are 11000 (approx.) active user accounts being maintained in the Active Directory. It also provides INTRANET web related services of the Institute.

#### **Renewal of License /Software**

The Centre has renewed the Matlab and Grammarly software license with unlimited users campus license.

#### **WORKSHOP CONDUCTED:**

Matlab Workshop: A workshop on "MATLAB for New-generation Engineers & Scientists" is conducted with the help of Mathworks Team on 9<sup>th</sup> October 2023. More than 50 students and faculty members participated in the workshop.

HPC Workshop: An HPC Software workshop conducted on 2<sup>nd</sup> March 2024 in collaboration with CDAC Bengaluru. More than 120 students and faculty members participated in the workshop.

#### **ONGOING SPONSORED PROGRAMMES:**

##### **Nation-wide Deployment of Threat Capturing Sensors for NCCC**

Ministry of Electronics and Information Technology (MeitY) and Indian Computer emergency Response Team (CERT-In), the national nodal agency for Cyber Security, are implementing a National level project called National Cyber Coordination Centre (NCCC). The project, Nation Wide Deployment of Honeypot Threat Capturing Sensors for NCCC, is to create a nation-wide network of honeypot sensors for monitoring, capturing, collection and enrichment of increasing trends of threats on cyber ecosystem of the country. IIT Guwahati has been identified as one of the participating organization of this project. Participating organization will get access to Centralized Honey Net Portal and repository of India specific cyber-attack data, thus enhancing organization's capacity to secure its network and devices. As a part of the project, necessary sensor servers are installed in CCC with IIT Guwahati public IP.

#### **CONSULTANCY AND OTHER COMMUNITY SERVICES**

The Computer Centre has been involved in setting up of campus network and providing consultancy services to nearby educational institutes and state government departments as and when needed.

#### **FACULTY MEMBER**

Prof. Ratnajit Bhattacharjee

Department of Electronics and Electrical Engineering

## Central Instruments Facility

**YEAR OF ESTABLISHMENT OF THE CENTRE:** 2004

**ACADEMIC PROGRAMS OFFERED:** CIF hosts various sophisticated instruments that cater to the teaching and research needs of institute departments/centers/schools in many areas of modern science and technology.

**LABORATORY FACILITIES**

Sr. No.	Lab Number	Laboratory Name	Approx. Floor space (m <sup>2</sup> )	Availability of facilities like board, LCD, PC/Laptop, AC, internet
<b>GROUND FLOOR</b>				
01	CIF 001A	X-ray Diffraction (Single and Powder) (including Chiller and UPS)	234	Equipment, Furniture, PC, internet, ACs.
02	CIF 001B	Large Molecular X-ray Diffraction	104	-ditto-
03	CIF 002	Sigma and Sigma 300 FESEM (including UPS and Operator office)	234	-ditto-
04	CIF 003A	JEOL FETEM (including UPS and Chiller)	104	-ditto-
05	CIF 003B	FESEM (Gemini 300)	234	-ditto-
06	CIF 003C	AFM (Oxford)		-ditto-
07	CIF 004	ESR (JEOL) (including Chiller and UPS)	192	-ditto-
08	CIF005A	VSM (Lakeshore) (including Chiller and UPS)	192	-ditto-
09	CIF005B	ITC (GE)		
10	CIF006A	600 MHz FTNMR (Bruker) (including Compressor and UPS)	130	-ditto-
11	CIF006B	250 KN UTM (BISS)	32	-ditto-

12	CIF 007	MALDI-TOF (Bruker) / GPC (Agilent)/ XPS (Physical Electronics)	234	-ditto-
<b>FIRST FLOOR</b>				
13	CIF103A	Micro PIV (Dantec)	234	-ditto-
14	CIF103B	TGA/DSC (Netzsch) (including UPS and Chiller)		-ditto-
15	CIF105A	ICPMS and HRMS (Agilent) (including UPS and Cylinders)	192	-ditto-
16	CIF105B	Laser Micro RAMAN (Horiba)		-ditto-
17	CIF106A	Spectroscopic Ellipsometer, (SEMILAB)	192	-ditto-
18	CIF106B	TRPL (Edinburg)		-ditto-
19	CIF107A	Sample Preparation Room	192	-ditto-
20	CIF107B	Impedance and Material Analyzer (Novocontrol)		-ditto-
21	CIF108	BET Analyzer / CHNOS Analyzer	130	-ditto-
22	CIF109	Millipore water purification system and chemical Store	32	-ditto-

#### SOPHISTICATED INSTRUMENTS HOUSED AT THE CENTRAL INSTRUMENTS FACILITY(CIF)

No. of instruments: 30

#### EXISTING FACILITIES (MAJOR EQUIPMENT)

1. Electron Spin Resonance (ESR) Spectrometer, Make: JEOL, Model: JES-FA200
2. Field Emission Scanning Electron Microscope (FESEM) with OXFORD EDS, Make: Zeiss, Model: Sigma
3. Laser Micro Raman System, Make: Horiba Jobin Yvon, Model: LabRam HR
4. High-Temperature Differential Scanning Calorimetry (DSC) / Thermo Gravimetric (TG)System, Make: Netzsch Model: STA449F3A00
5. Transmission Electron Microscope (TEM), Make: JEOL, Model: JEM 2100

6. Vibrating Sample Magnetometer (VSM), Make: Lakeshore, Model:7400 series
7. Picosecond Time-resolved and Steady State Luminescence Spectrometer, Make: EdinburgInstruments, Model: Lifespec II & FSP 920.
8. Desktop Helium Liquefier, Make: Cryomech, Model: LHEP18
9. Spectroscopic Ellipsometer, Make: SEMILAB, Model: GES5E
10. Single Crystal X-ray Diffractometer, Make: Agilent, Model: Single source supernova E
11. Surface Area and Pore Size Analyzer and High-Pressure Surface Analyzer, Make: Quantachrome Instruments, Model: Autosorb, IQ MP
12. Impedance and Material Analyzer (IMA), Make: Novo control, Model: BDS 2300
13. 600 MHz Nuclear Magnetic Resonance (NMR) Spectrometer, Make: Bruker, Model: AVANCE III HD
14. 250 kN Servo Hydraulic Universal Testing Machine, Make: BISS, Model: MEDIAN 250
15. Matrix Assisted Laser Desorption/Ionization – Time Of Flight, Make: BRUKER Model: AUTOFLEX SPEED
16. Field Emission Transmission Electron Microscope (FETEM), Make: JEOL, Model: 2100F(HR)
17. Isothermal Titration Calorimeter, Make: GE Health Care, Model: iTC 200 Micro-calorimeter
18. Field Emission Scanning Electron Microscope (FESEM) with OXFORD windowless EDS,Make: Zeiss, Model: Gemini 300
19. Micro Particle Image Velocimetry System, Make: Dantec Model: 9080M0571
20. Field Emission Scanning Electron Microscope (FESEM) with Element EDS Detector, Make: Zeiss, Model: Sigma 300
21. Large Molecule Single Crystal X-ray Diffractometer, Make: Rigaku Model: Micromax 007HF R-axis IV<sup>++</sup> Oxford
22. High-Temperature Gel Permeation Chromatography (HT-GPC), Make: Agilent, Model:G7820A
23. Atomic Force Microscope, Make: Oxford Instruments, Model: Cypher S
24. 9 kW Powder X-Ray Diffractometer, Make: Rigaku Technologies, JAPAN, Model: Smartlab
25. 5 kN Electromechanical Universal Testing Machine, Make: ZwickRoell, Model: Z005TNProline
26. Photovoltaic/ Solar Cell/ Photo-Electrochemical Analyzer/Workstation, Make: CH Instruments Inc., USA, Model: CHI 604E + Amp i-t
27. Automated ultra-high vacuum (UHV) X-ray photoelectron spectroscopy, Make: M/s Physical Electronics, USA; Model: PHI 5000 versa probe III

#### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

28. Inductively Coupled Plasma Mass Spectrometer (ICPMS)Make Agilent, Model: 7850 ICP-MS.

29. Ultra High-Performance Liquid Chromatography-Quadrupole Time of Flight-High Resolution Mass Spectrophotometer (UHPLC-QTOF-HRMS) Make: Agilent Model: 654
30. CHNSO Analyzer, Make Elementa Model: VARIO MACRO CUBE.

#### **MAJOR EQUIPMENT AND FACILITIES TO BE PROPOSED**

- Vibrating Sample Magnetometer (VSM)
- Field Emission Transmission Electron Microscope (FETEM)
- Laser Micro Raman System
- Electron Spin Resonance (ESR) Spectrometer
- Single Crystal X-ray Diffractometer
- Field Emission Scanning Electron Microscope
- Ultrafast amplified laser system

#### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

- Instrumentation facility is used by 20 out of 28 Departments, Centres, and Schools of the Institute.
- The facilities of CIF are also used by 48 external institutes from all over India especially North-eastern region on a minimal chargeable basis.

#### **CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

- (1) One-day long demonstration of sophisticated Instruments to Professor (01) and students (10) of GIFU University, Japan on 8<sup>th</sup> March 2024 during 3<sup>rd</sup> Spring School 2024.
- (2) Demonstration of Sophisticated and High-end equipment to M.Sc., B. Tech. and Ph.D. students of IITG have been conducted on a regular basis.

#### **OUTREACH EDUCATIONAL PROGRAM VISITS TO CIF**

Following students from different Schools/ Colleges visited CIF, and IITG during the said period.

<b>Sl. No.</b>	<b>Name of the Organization</b>	<b>Date</b>	<b>No. of stud. + teachers (std)</b>
1.	Pioneer Academy, Goresswar, Kamrup	22/08/2023	89 (XI & XII)
2.	A.K. Higher Secondary School, North Guwahati, Kamrup	01/09/2023	40 (IX & X)
3.	Novodaya Regional Level Science meet, held at IITG	18/10/2023	100 (IX & X)
4.	Vivekananda Kendriya Vidyalaya, Mongaoldoi	03/11/2023	35 (XI)



5.	Sarupathar H S School, Golaghat	03/01/2024	26 (XI & XII)
6.	Faculty HS School, Gitanagar, Guwahati	30/01/2024	60 (XI & XII)
7.	Dhing College, Nagaon	22/02/2024	30 (B.Sc. Chem Major)
8	Students Visit under Rastriya Aviskar Avijan, Nagaon	29/02/2024	100 (XI & XII)
9.	Sarva Xiksha Abhijan (SSA) Nalabari	29/02/2024	100 (VII, IX & X)
10	St Anthony College, Shillong	18/03/2024	50(B.Sc.)
11	Aryavidyapith College, Guwahati	20/03/2024	40 (B.Sc. Phy Major)
12	Orient Academy; Lakhimpur	22/03/2024	44(IX & X)

### Students trained for CIF instrument operation

Sl. No.	Department	Existing CIF trained Operators	New operators (Under Training)
1.	Department of Chemical Engineering	25	14
2.	School of Agro and Rural Technology	01	00
3.	Centre for Environment	12	04
4.	Centre for Nanotechnology	06	03
5.	School of Energy Science and engineering	10	01
6.	Department of Civil Engineering	13	03
7.	Department of Bioscience and Bioengineering	23	04
8.	Department of Mechanical Engineering	10	01
9.	Department of Physics	36	06
10.	Department of Chemistry	60	13
<b>Total number of students trained</b>		<b>196</b>	<b>49</b>

#### Revenue Generated:

An amount equal to INR 8,93,071/- has been collected as sample charges from the analysis of external samples during the reporting year (2023- 2024).

#### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01.	Dr. Gagan Kumar	Indian Institute of Technology, Delhi	Professor	Terahertz Plasmonics and metamaterials, Guided Wave Devices, Ultrafast Spectroscopy.

# Lakshminath Bezbaroa Central Library

Being a major service centre of the Institute, Lakshminath Bezbaroa Central Library provides library and information services to support teaching, learning, research activities by creating state-of-the-art facilities and offering innovative services. The library is a window to world of latest information in sciences, engineering, technology, humanities & social sciences with a fast growing collection of books, journals, magazines both in print and digital format. It is housed on a four-stored building having a floor area of about 7500 sq. meter and can accommodate around 475 readers at a time. In-house services of the library are fully computerized and wi-fi facility is provided within library building for connecting to internet and accessing Institute's electronic resources.

During the reported period about 58 visitors from other academic institutions have availed reference and reading facilities of the Library. In addition to that, about 1,091 students, teachers, researchers from 19 schools, colleges and universities and more than 500 readers visited the Library for their academic purposes. Library remains open from 8.00 am to 02.00 am (next day) throughout the year and 24 hours during mid/end semester examination, to provide reading facility to Institute's academic community. During the reporting period, total 68,960 books were circulated by 5,329 Institute users and more than 22 lakhs journal articles were downloaded.

#### Collection Development:

- a) The library has a fast growing collection of books, journals, magazines both in print and digital format. A large number of books, database, international and national journals on various subjects have been added during Financial Year 2023-24. Total collection strength of the Library now stands as follows:

ITEMS	Collection Size (2023-24)
Printed Books and bound volume journals (including NBHM collection)	1,88,604
E- books (including NBHM collection)	2,42,674
Standards (Online version)	73,762
Online Journals (including backfiles & current journals subscribed and provided by Consortia)	26,702
Ph.D. Theses	2,486
Non-Book material (CD, DVD, etc.)	7,165
Current Print Journals	15

- b) The growth of the collections since 2014-15 stand as follow:

Sl. No.	F.Y.	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
(i)	Printed Books & Bound Volume Journals	1,54,564	1,57,955	1,64,701	1,69,409	1,76,947	1,80,878	1,81,748	1,83,160	1,84,324	1,88,604
(ii)	E-books	1,45,770	1,47,463	1,53,089	1,80,559	1,88,516	2,03,640	2,15,466	2,15,466	2,37,016	2,42,674
(ii)	Printed Journals	120	90	84	68	50	29	29	25	17	15
(iii)	Online Journals (including	12,835	24,012	24,264	25,143*	27,492*	27,557*	26,186*	26,282*	26,664*	26,702*

journals subscribed and access provided by Consortia)											
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\* includes backfiles

- c) As scientific research activities are profoundly dependent on the journal publications, Library has emphasized on enhancing subscription of current journals and expanded the collection significantly over last few years. Further, for better accessibility of contents, efforts have been made to increase online journal collection over printed journals. Presently Library is subscribing 15,718 current journals across all academic areas. In addition to that, Institute is having access to 8,833 online journals through ‘e-Shodh Sindhu Consortium’ and ‘DeLCON: DBT- Electronic Library Consortium’.
- d) Apart from the above, Library has procured some of world’s most renowned abstract/full-text database like ACS Web Edition, Brill Journal Collection (Humanities & Social Sciences and Biology journals Collection),EBSCO Business Source Complete, eHRAF Database, IEC Standards, INFORMS Journal Collection, IOP Science Collection, ISO Standards, OnePetro, ProQuest Academic Complete – eBook Collection, Royal Society of Chemistry Gold Collection, Sage Journal Collection (Management & Organization Studies),SciFinder<sup>®</sup>, Scopus, SUMMON 360+ Link, etc., and some well-known national database i.e. CMIE ProweesIQ, Economic Outlook, BIS Standards, EPWRF Time Series, etc. during the reporting period.
- e) Library has also subscribed Turnitin, a Plagiarism-detection Software, during the reporting period.
- f) To make awareness about the regional culture and to generate interest about vernacular literature, Library has developed a reasonably good collection on Assamese and Hindi language and on literary works of Sahityarthi Lakshminath Bezbaroa.
- g) Library has developed a good number of collection on Braille Books and a special literary collection on Mahatma Gandhi.

### 1.Expenditure on books and research journals:

Expenditure on books and research journal of Lakshminath Bezbaroa Central Library has also increased over last ten financial years, details of which as follows:

Financial Year	Expenditure on Books (Rs. In Lakhs)	Expenditure on Research Journals (Rs. In Lakhs)
2014 -15	190.82	666.84
2015–16	124.91	685.72
2016-17	75.12	746.20

2017-18	149.99	883.89
2018-19	148.87	1,022.56
2019-20	65.58	1,088.22
2020-21	52.80	1,140.40
2021-22	55.21	1,200.25
2022-23	92.45	1,304.72
2023-24	59.02	1,362.72

## 2. Services and Facilities:

- a) To facilitate the users, a digital repository of theses, submitted by Ph. D. scholars of the Institute, has been created and made accessible to the academic community via <http://gyan.iitg.ac.in>. By end of the reporting period, total 2,486 full-text theses had been uploaded in the stated repository. In addition to this facility, Institute Library has joined hand with the Shodhganga portal of INFLIBNET Centre on 25<sup>th</sup> July, 2022 and theses are being uploaded on that portal.
- b) To extend better searching of huge electronic resources of the Library, a world-renowned Discovery Service has been made available to academic community of the Institute.
- c) Two RFID based Book Drop Kiosks and two Self- Check-Out Kiosk have been installed for self issue/re-issue/return of library books beyond regular working hours.
- d) For safekeeping of personal belongings of library users, token-based property counter has been made available throughout library operation hours.
- e) To facilitate and enable the academic community to access paid online contents from their own residences beyond Institute campus, Lakshminath Bezbaroa Central Library provides remote access to e-resources via Shibboleth in association with INDIAN Access Management Federation (INFED) at INFLIBNET Centre, Ahmedabad.

## 3. Infrastructure and developmental activities:

- a) For enabling better delivery of circulation facility, the library management software has been upgraded to web-based version. This helped to provide better browsing of library collection, instant email and SMS generation for individual library transactions.
- b) A large format display monitor has been installed for intimating the users about recent developments and facilities of library.
- c) Interior of entire Library building has been renovated with modern illumination system for creating appropriate ambiance for readers.
- d) North East Regional Centre of National Digital Library of India (NDLI), which is operating under Lakshminath Bezbaroa Central Library provided training & support to build digital repositories to the institutes of North East India.

## Centre for Career Development

The placement scenario of IIT Guwahati for the year 2023-24 has been impressive. More than 448 companies/organizations from various categories [Private, MNC (Indian origin and Foreign origin), Govt., PSU, NGO, etc.] and sectors (Sector wise- IT, R&D, Core Engineering, Consulting, Analytics, Finance, Oil & Gas, Educational, etc.) participated in the recruitment process. It includes a total of 12 PSUs.

The total number of registered students for campus placement in the year 2023-24 is 1654 and 1084 nos. of students already got placed so far. A total of 219 numbers of students received PPOs this year. It is worth mentioning that a total of 102 students got package of 50 LPA.

A total of 841 number of B.Tech students registered for placement in 2023-24. Among this, 622 (74%) students have been placed so far. Overall, more than 40% students have been placed in the respective core sectors.

Students' internship record has been pretty good this year. More than 115 companies registered for internship in 2023-24 and 426 nos. of students received internship offers so far. There was 100% internship offers for MBA students. Further, a significant increase in master's students' internships has been witnessed as compared to last year's data.

Besides, motivational talks, career counseling and soft-skill development workshops were also organized for the students. Some of them are listed below. A few photographs are also appended.

<b>Name of the event</b>	<b>Date</b>
Talk on Career in Indian armed forces	21/03/2023
A talk on Civil Service as Career Option	03/04/2023
HP Omen Valorant Gaming Event	04-06/08/2023
Talk on higher studies in USA	17/08/2023
Talk on Indian Navy as a Career Choice	25/08/2023
Session on how to crack Product Management (PM) Interviews	01/10/2023
Meeting with Google team	20/10/2023
Interactive Session with the Officials of Airports Authority of India (AAI), a miniratna, and Seminar on Vigilance Awareness and Exciting Career Opportunities in AAI	02/11/2023
Science to Startups – commercializing deep tech products	24/04/2024

In addition to the campus hiring for the students, CCD also organizes various training programs for staff members to upgrade their skills and apprise with latest changes. A total of four numbers of training programs were organized by CCD with the help of SIERD, New Delhi for the staff/officers/faculty in the year 2023-24 as given below:

- Public Procurement, E-Procurement, Govt. E-Marketplace (GeM) during July 17-19, 2023
- RTI related office procedure during September 25-26, 2023
- Accounting, Auditing and Preparation of UC/SE for Various Schemes/Extramural Project funded by Central or State Govt. Dept. & Autonomous Institutions during February 05-07, 2024
- Recruitment Procedures, Promotion Rules, Seniority, APAR, DPC, Sealed Cover Penalties, Roster Maintenance & Pay Fixation during March 14-15, 2024



**Centre for Educational Technology**

**YEAR OF ESTABLISHMENT OF THE CENTRE: 2003-2004**

**ACADEMIC PROGRAMMES OFFERED**

S. No.	PROGRAMMES DEVELOPED/OFFERED	Scheme
1	Developed several UG/PG academic courses covering almost all the science /Engineering discipline offered by IITG faculties	CSS-MOOCs
2	Administrated the admission process of Masters & PhD (All Science and Engineering Departments)	QIP
3	Interdisciplinary/Industry oriented/Research oriented academic short-term courses jointly developed by an international faculty of repute along with IITG faculty	GIAN
4	Online courses and Professional Certificates	Coursera
5	Training Courses for Defense forces	PRC

**LABORATORY FACILITIES**

- State-of-the-art E-class room:  
Provides all facilities to conduct online lectures and connects across the Nation. Provides facilities for IITG Faculty to conduct Lectures in other IITs & institutions from IITG campus.
- Video Studios (1,2 & 3):  
Recording of various educational content is done in these studios. These studios are equipped with devices of latest technology such as, HD cameras, interactive display, Graphics tablet, Switcher, Recorder etc.
- Editing Laboratory (1&2)  
Edits all kind of educational content created at IITG, using iMac & Apple Mac Pro systems.
- MOOCs Laboratory:  
Uploads & maintains MOOCs Content on Servers for National & International learners via NPTEL HQ at IITM.
- State-of-the-art Video Conferencing Room:  
This Video Conferencing room contains 9+1 node VC system, 5.1 Digital Dolby system & NKN backbone. It enables us to have conference with all IITs and IISc simultaneously.
- Live Session Room (1 & 2): These rooms are used for regular live sessions of various MOOCs courses

**MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

- **Mac Studio**
- **ISO Recorders**
- **Desktops etc.**

## MAJOR AREAS OF RESEARCH AND DEVELOPMENT

Course Content Creation with a foreign expert under GIAN, MOOCS content creation.

Generation of video lectures for e-learning.

## MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

Total 25 nos. of new and 128 nos. of rerun video courses were completed under CSS-MOOCs.

5 nos. of Post Graduate certificate programs were offered under Coursera platform.

5 nos. of students were admitted to PhD under QIP scheme.

1 no. of 3 months certificate program on Drone Technology was conducted.

## POST GRADUATE CERTIFICATE PROGRAM OFFERED ON COURSERA PLATFORM

Sl. No.	Name of Certificate program	Name of Faculty (Coordinator/Course Instructor)	Duration	National/International	Enrollment/Certificate Achiever
1	Deep Learning for Computer Vision & XR	Prof. Samit Bhattacharya & Prof. S Ranbir Singh	24 Weeks	International	04(CA)
2	Cloud Computing Applications	Prof. Samit Bhattacharya & Prof. T Venkatesh	24 Weeks	International	04(CA)
3	Robotics & Mechatronics	Prof. B. Sandeep Reddy, Prof. Sajan Kapil & Prof. S. K. Dwivedy	28 Weeks	International	03(ENROL)
4	Human Computer Interaction & User Experience Design	Prof. Keyur Sorathia, Prof. Pratul C. Kalita & Prof. Debayan Dhar	24 Weeks	International	59(CA)
5	Digital Manufacturing	Prof. Sajan Kapil, Prof. Samit Bhattacharya, Prof. B. Sandeep Reddy & Prof. Deepak Sharma	25 Weeks	International	05(ENROL)

## SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl.No.	Name of Faculty (Convener/Coordinator, etc.)	Name of Sem./Wor./Con.	Funded by	Date	National/International	No. of participants/enrollment
1	Prof. T. V. Bharat & Prof. S.K.Dwivedy	A one-day seminar on Certification scheme for drones by QCI	DGR	19-10-2023	National	29
2	Prof. T. V. Bharat & Prof. S.K.Dwivedy	Drone Technology for Defence Forces	DGR	1/12/2024	National	29

Online Video courses developed Under CSS-MOOCs						
1.	Prof. Arunasis Chakaraborty	Reliability-Based Structural Design	MHRD	July 2023	National	457
2.	Prof. Nanda Kishore	Organic Chemical Technology	MHRD	July 2023	National	619
3.	Prof. Subrata Kumar Majumder	Solid-Fluid Operations	MHRD	July 2023	National	178
4.	Prof. Vaibhav V. Goud	Energy Conversion Technologies (Biomass and Coal)	MHRD	July 2023	National	1359
5.	Prof. Pankaj Tiwari	Petroleum Reservoir Engineering	MHRD	July 2023	National	945
6.	Prof. Urmi R. Salve	Ergonomics Research Techniques	MHRD	July 2023	National	496
7.	Dr. Ribhu	Simulation of Communication Systems Using Matlab	MHRD	July 2023	National	2344
8.	Dr. Debabrata Sikdar	Nanophotonics, Plasmonics, And Metamaterials	MHRD	July 2023	National	957
9.	Prof. M.K. Bhuyan	Machine Learning and Deep Learning - Fundamentals and Applications	MHRD	July 2023	National	14271
10.	Dr. Pankaj Kalita	Sustainable Power Generation Systems	MHRD	July 2023	National	4992
11.	Prof. Saurabh Basu	Quantum Hall Effects	MHRD	July 2023	National	618
12.	Prof. Biplab Bose	Introduction to Dynamical Models In Biology	MHRD	July 2023	National	628
13.	Prof. Sudip Talukdar	Plates and Shells	MHRD	July 2023	National	483
14.	Prof. Rajib Kumar Bhattacharjya	Optimization Methods for Civil Engineering	MHRD	July 2023	National	1255
15.	Prof. Subashisa Dutta	River Engineering	MHRD	July 2023	National	1162

16.	Prof. Subrata Kumar Majumder	Chemical Process Intensification	MHRD	July 2023	National	345
17.	Prof. Subrata Kumar Majumder	Fluidization Engineering	MHRD	July 2023	National	208
18.	Prof. Bishnupada Mandal	Chemical Reaction Engineering-I	MHRD	July 2023	National	754
19.	Prof. Nanda Kishore	Mechanical Unit Operations	MHRD	July 2023	National	392
20.	Prof. Nanda Kishore	Transport Phenomena of Non-Newtonian Fluids	MHRD	July 2023	National	304
21.	Prof. Chandan Das	Mass Transfer Operations II	MHRD	July 2023	National	409
22.	Prof. Amit Kumar	Introduction to Polymer Physics-IITG	MHRD	July 2023	National	226
23.	Prof. Bishnupada Mandal	Mass Transfer Operations - I	MHRD	July 2023	National	758
24.	Prof. T Punniyamurthy	Principles of Organic Synthesis	MHRD	July 2023	National	995
25.	Prof. Urmi R. Salve	Ergonomics Workplace Analysis	MHRD	July 2023	National	478
26.	Prof. Sharmistha Banerjee	System Design for Sustainability	MHRD	July 2023	National	580
27.	Prof. Amarjyoti Mahanta	Introduction to Market Structures	MHRD	July 2023	National	1163
28.	Prof. Sambit Mallick	Sociology of Development	MHRD	July 2023	National	1176
29.	Prof. Amaresh Dalal	Fundamentals of Convective Heat Transfer	MHRD	July 2023	National	456
30.	Prof. Niranjan Sahoo	Advanced Thermodynamics and Combustion	MHRD	July 2023	National	1060
31.	Prof. Sachin Singh Gautam	Computational Continuum Mechanics	MHRD	July 2023	National	340
32.	Prof. Atanu Banerjee	Finite Element Method: Variational Methods to Computer Programming	MHRD	July 2023	National	745

	Prof. Arup Nandy					
33.	Prof. Swarup Bag	Mathematical Modeling of Manufacturing Processes	MHRD	July 2023	National	657
34.	Prof. Amaresh Dalal Prof. Dipankar N.Basu	Fundamentals of Conduction and Radiation	MHRD	July 2023	National	351
35.	Prof. Prasenjit Khanikar	Dynamic Behaviour Of Materials	MHRD	July 2023	National	254
36.	Prof. Dipankar N. Basu	Applied Thermodynamics for Engineers	MHRD	July 2023	National	817
37.	Prof. Pranab K. Mondal	Principle of Hydraulic Machines and System Design	MHRD	July 2023	National	541
38.	Prof. Saurabh Basu	Numerical Methods and Simulation Techniques for Scientists and Engineers	MHRD	July 2023	National	870
39.	Prof. Saurabh Basu	Advanced Quantum Mechanics with Applications	MHRD	July 2023	National	1941
40.	Prof. Girish S. Setlur	Dynamics of Classical and Quantum Fields	MHRD	July 2023	National	455
41.	Prof. Sudip Mitra	Natural Resources Management	MHRD	July 2023	National	3114
42.	Prof. Vishal Trivedi	Genetic Engineering: Theory and Application	MHRD	July 2023	National	3177
43.	Prof. Utpal Bora	Genome Editing and Engineering	MHRD	July 2023	National	2095
44.	Prof. Vishal Trivedi	Experimental Biotechnology	MHRD	July 2023	National	3449
45.	Prof. Rishikesh Bharti	Remote Sensing And GIS	MHRD	July 2023	National	5147
46.	Prof. Subashisa Dutta	Fluid Mechanics	MHRD	July 2023	National	2718
47.	Prof. Ajay Kalamdhad	Municipal Solid Waste Management	MHRD	July 2023	National	7737

48.	Prof. Abhishek Kumar	Subsurface Exploration: Importance and Techniques Involved	MHRD	July 2023	National	818
49.	Prof. Pankaj Tiwari	Natural Gas Engineering	MHRD	July 2023	National	541
50.	Prof. Prabirkumar Saha	Aspen Plus® Simulation Software - A Basic Course for Beginners	MHRD	July 2023	National	4150
51.	Prof. R. Anandalakshmi	Thermal Processing of Foods	MHRD	July 2023	National	983
52.	Prof. John Jose	(Multi-Core Computer Architecture) Multi-Core Computer Architecture – Storage and Interconnects	MHRD	July 2023	National	7715
53.	Prof. Chandan Karfa	C-Based VLSI Design	MHRD	July 2023	National	4714
54.	Prof. Samit Bhattacharya	Computer Graphics	MHRD	July 2023	National	11008
55.	Prof. Samit Bhattacharya	Design & Implementation of Human-Computer Interfaces	MHRD	July 2023	National	4495
56.	Prof. Subhas Chandra Pan	Reagents in Organic Synthesis	MHRD	July 2023	National	1138
57.	Prof. Ratnajit Bhattacharjee	Microwave Engineering	MHRD	July 2023	National	1360
58.	Prof. Shaik Rafi Ahamed	System Design Through Verilog	MHRD	July 2023	National	6656
59.	Prof. Shyamanta M. Hazarika	Fundamentals of Artificial Intelligence	MHRD	July 2023	National	15377
60.	Prof. Pankaj Kalita	Solar Energy Engineering And Technology	MHRD	July 2023	National	3434
61.	Prof. Rajshree Bedamatta	Development Research Methods	MHRD	July 2023	National	2718
62.	Prof. Naveen Kashyap	The Psychology of Language	MHRD	July 2023	National	4152
63.	Prof. Ngamjahao Kipgen	Ecology and Society	MHRD	July 2023	National	2791

64.	Prof. Sambit Mallick	Science, Technology and Society	MHRD	July 2023	National	1362
65.	Prof. Mithilesh Kumar Jha	Introduction to Western Political Thought	MHRD	July 2023	National	1266
66.	Prof. Ngamjahao Kipgen	Environment and Development	MHRD	July 2023	National	10159
67.	Prof. Debarshi Das	Mathematics for Economics - I	MHRD	July 2023	National	1047
68.	Prof. Naveen Kashyap	Consumer Psychology	MHRD	July 2023	National	8104
69.	Prof. Swarup Bag	Advances in Welding and Joining Technologies	MHRD	July 2023	National	3155
70.	Prof. Vinayak N. Kulkarni	Aircraft Propulsion	MHRD	July 2023	National	2370
71.	Prof. Niranjana Sahoo Prof. Pranab K. Mondal	Applied Thermodynamics	MHRD	July 2023	National	1656
72.	Prof. Shrikrishna N. Joshi	Automation in Manufacturing	MHRD	July 2023	National	6770
73.	Prof. S. N. Joshi	Laser Based Manufacturing	MHRD	July 2023	National	2582
74.	Prof. Vinayak N. Kulkarni	Steam Power Engineering	MHRD	July 2023	National	702
75.	Prof. Pankaj Biswas	Welding Application Technology	MHRD	July 2023	National	2419
76.	Prof. Sajan Kapil	Fundamentals of Additive Manufacturing Technologies	MHRD	July 2023	National	4149
77.	Prof. Manas Das	Advanced Machining Processes	MHRD	July 2023	National	5699
78.	Prof. Poulouse Poulouse	Nuclear and Particle Physics	MHRD	July 2023	National	1881
79.	Dr Abhishek Kumar	Applied Seismology for Engineers	MHRD	Jan 2024	National	527
80.	Prof. Tamal Banerjee	Applied Statistical Thermodynamics	MHRD	Jan 2024	National	190



81.	Dr. Chandan Karfa, Dr. Aryabartta Sahu	Digital Design with Verilog	MHRD	Jan 2024	National	6795
82.	Prof. Shaik Rafi Ahamed	Integrated Circuits and Applications	MHRD	Jan 2024	National	2318
83.	Prof. Swarup Bag	Introduction to Solidification Processing	MHRD	Jan 2024	National	621
84.	Prof. R Ganesh Narayanan	Mechanics of Sheet Metal Forming	MHRD	Jan 2024	National	1251
85.	Prof Vishal Trivedi	Molecular Biology	MHRD	Jan 2024	National	4890
86.	Dr. Abraham Cyril Issac	Organizational Behaviour: Individual Dynamics in Organization	MHRD	Jan 2024	National	3567
87.	Prof. Hemangee K. Kapoor	Parallel Computer Architecture	MHRD	Jan 2024	National	1982
88.	Prof. Niranjan Sahoo	Power Plant System Engineering	MHRD	Jan 2024	National	1862
89.	Dr. Dilwar Hussain	Psychology of Emotion: Theory and Applications	MHRD	Jan 2024	National	3536
90.	Prof. Amarendra Kumar Sarma	Quantum Entanglement: Fundamentals, measures and applications	MHRD	Jan 2024	National	1542
91.	Dr. Arunasis Chakarborty	Structural Vibration	MHRD	Jan 2024	National	591
92.	Prof. Saurabh Basu	Topology and Condensed Matter Physics	MHRD	Jan 2024	National	780
93.	Prof. Saurabh Basu	Advanced Condensed Matter Physics	MHRD	Jan 2024	National	1136
94.	Prof. Sreedeeep S	Advanced Soil Mechanics	MHRD	Jan 2024	National	1352
95.	Prof. Nanda Kishore	Advanced Thermodynamics	MHRD	Jan 2024	National	463
96.	Prof. Subrata Kumar Majumdar	Basic Principles and Calculations in Chemical Engineering	MHRD	Jan 2024	National	799
97.	Prof. Bidisha Som	Bilingualism: A cognitive and psycholinguistic perspective	MHRD	Jan 2024	National	410

98.	Prof. Lalit M. Pandey	Biointerface Engineering	MHRD	Jan 2024	National	509
99.	Prof. Tamal Banerjee	Chemical Process Technology	MHRD	Jan 2024	National	524
100.	Prof. Amaresh Dalal	Computational Fluid Dynamics for Incompressible Flows	MHRD	Jan 2024	National	1321
101.	Prof. Prakash Kotecha	Computer Aided Applied Single Objective Optimization	MHRD	Jan 2024	National	338
102.	Prof. Sreeja Pekkat	Engineering Hydrology	MHRD	Jan 2024	National	1578
103.	Prof. Lal Mohan Kundu	Essentials of Biomolecules: Nucleic Acids and Peptides	MHRD	Jan 2024	National	530
104.	Prof. Deepak Sharma	Evolutionary Computation for Single and Multi-Objective Optimization	MHRD	Jan 2024	National	347
105.	Prof. Swarup Bag	Finite Element Modeling of Welding Processes	MHRD	Jan 2024	National	500
106.	Prof. Subrata Kumar Majumdar	Fluid Flow Operations	MHRD	Jan 2024	National	379
107.	Prof. Raghvendra Gupta	Fundamental of Fluid Mechanics for Chemical and Biomedical Engineers	MHRD	Jan 2024	National	207
108.	Prof. Niranjan Sahoo	Fundamentals of Compressible Flow	MHRD	Jan 2024	National	298
109.	Prof. Nanda Kishore	Inorganic Chemical Technology	MHRD	Jan 2024	National	412
110.	Prof. Swarup Bag	Introduction to Crystal Elasticity and Crystal Plasticity	MHRD	Jan 2024	National	113
111.	Prof. N. Selvaraju	Introduction to Queueing Theory	MHRD	Jan 2024	National	361
112.	Prof. Girish S. Setlur	Introduction to Statistical Mechanics	MHRD	Jan 2024	National	823
113.	Prof. Debabrata Chakraborty	Mechanics of Fiber Reinforced Polymer Composite Structures	MHRD	Jan 2024	National	617

114.	Prof. Raghvendra Gupta	Multiphase Microfluidics	MHRD	Jan 2024	National	194
115.	Prof. S. K. Dwivedy	Nonlinear Vibration	MHRD	Jan 2024	National	324
116.	Prof. Sambit Mallick	Philosophical Foundations of Social Research	MHRD	Jan 2024	National	290
117.	Prof. Shakuntala Mahanta	Phonetics and Phonology: A Broad Overview	MHRD	Jan 2024	National	562
118.	Prof. Tamal Banerjee	Physical and Electrochemical Characterizations in Chemical Engineering	MHRD	Jan 2024	National	242
119.	Prof. Sambit Mallick	Sociological Perspectives on Modernity	MHRD	Jan 2024	National	253
120.	Prof. Poonam Kumari	Theory of Composite Shells	MHRD	Jan 2024	National	190
121.	Prof. Poonam Kumari	Theory of Rectangular Plates-Part I	MHRD	Jan 2024	National	126
122.	Prof. Sandip Paul	Thermodynamics: Classical To Statistical	MHRD	Jan 2024	National	271
123.	Prof. Manmohan Pandey	Two-Phase Flow with Phase Change in Conventional and Miniature Channels	MHRD	Jan 2024	National	134
124.	Prof. Tadikonda Venkata Bharat	Unsaturated Soil Mechanics	MHRD	Jan 2024	National	275
125.	Prof. Debayan Dhar	Usability Engineering	MHRD	Jan 2024	National	426
126.	Prof. Sudip Talukdar	Vibration of Continuous Systems	MHRD	Jan 2024	National	259
127.	Prof. Amaresh Dalal	Viscous Fluid Flow	MHRD	Jan 2024	National	315
128.	Prof. Saurabh Basu	A Brief Course on Superconductivity	MHRD	Jan 2024	National	5119
129.	Prof. Prabirkumar Saha	Aspen Plus Simulation Software - A Basic Course for Beginners	MHRD	Jan 2024	National	3744

130.	Prof. Kaustubha Mohanty	Biomass Conversion and Biorefinery	MHRD	Jan 2024	National	1734
131.	Prof. M. K. Bhuyan	Computer Vision and Image Processing - Fundamentals and Applications	MHRD	Jan 2024	National	9400
132.	Prof. Indu Siva Ranjani Gandhi	Construction Methods and Equipment Management	MHRD	Jan 2024	National	2930
133.	Prof. Biplab Bose	Data Analysis for Biologists	MHRD	Jan 2024	National	3516
134.	Prof. Shabari Nath	Design of Power Electronic Converters	MHRD	Jan 2024	National	4871
135.	Prof. Rajshree Bedamatta	Economic Growth and Development	MHRD	Jan 2024	National	2265
136.	Prof. Vishal Trivedi	Enzyme Sciences and Technology	MHRD	Jan 2024	National	1618
137.	Prof. Anil Kumar Mishra	Expansive Soil	MHRD	Jan 2024	National	1226
138.	Prof. Pankaj Biswas	Fundamental of Welding Science and Technology	MHRD	Jan 2024	National	2554
139.	Prof. Naveen Kashyap	Human Behaviour	MHRD	Jan 2024	National	14140
140.	Prof. Pranab K. Mondal, Prof. Vinayak N. Kulkarni	IC Engines and Gas Turbines	MHRD	Jan 2024	National	2815
141.	Prof. Naveen Kashyap	Introduction to Cognitive Psychology	MHRD	Jan 2024	National	6514
142.	Prof. Kiran Keshavamurthy	Introduction to Modern Indian Drama	MHRD	Jan 2024	National	1458
143.	Prof. Mithilesh Kumar Jha	Introduction to Modern Indian Political Thought	MHRD	Jan 2024	National	2403
144.	Prof. Mithilesh Kumar Jha	Introduction to Political Theory	MHRD	Jan 2024	National	1284
145.	Prof. Bidisha Som	Language, Culture and Cognition: An Introduction	MHRD	Jan 2024	National	351
146.	Prof. Uday S. Dixit	Mechanics of Machining	MHRD	Jan 2024	National	497

147.	Prof. Kaustubha Mohanty	Membrane Technology	MHRD	Jan 2024	National	684
148.	Prof. Shaik Rafi Ahamed	Microprocessors and Interfacing	MHRD	Jan 2024	National	2528
149.	Prof. Sanjib Ganguly	Operation and Planning of Power Distribution Systems	MHRD	Jan 2024	National	1642
150.	Prof. Dilwar Hussain	Psychology of Stress, Health and Well-Being	MHRD	Jan 2024	National	12278
151.	Prof. Vaibhav Vasant Goud, Prof. R. Anandalakshmi	Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems	MHRD	Jan 2024	National	4112
152.	Prof. Pranab K. Mondal	Thermal Engineering: Basic and Applied	MHRD	Jan 2024	National	797
153.	Prof. Samit Bhattacharya	User-centric Computing for Human-Computer Interaction	MHRD	Jan 2024	National	2173

**LOGISTIC SUPPORT OF CET ON SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED**

Sl. No .	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Prof. Subhasisa Dutta	River Corridor Research and Management Conference	TIH, IIT Guwahati	March 7-9, 2024	International	80 (offline)+50 (online)
03	Prof. Bidisa Som	iBrain	Erasmus Plus grant of European Commission	05-08-2023 to 04-11-2023	International	451(for all 7 days)
04	Prof. S.K.Dwivedy	Certification Scheme for Unmanned Aircraft system (UAS)	TIH Division, IITG-TIDF	05 January 2024	National	45
05	Dr. Srinivasan Krishnaswamy	International Conference on History of Mathematics (ICHM)	Dr. Naba Goswami Foundation, Pandit Hemchandra Goswami Foundation, Dr. Vishal S. Sharma, Australia, Central	19-01-2024 to 21-01-2014	International	52

			Institute of Technology Kokrajhar, NIT Meghalaya, BMG INFORMATICS PVT. LTD., Guwahati, Er. Dharendra Sinha, B.Tech. (2001), IIT Guwahati			
06	Prof. Subhasisa Dutta	International workshop on Precipitation and Floods Coupled Cycles in the North-East Region	NMHS project, IIT Guwahati	9/5/2023	International	20 (offline)+100 (online)
07	Prof. Akhilesh K Maurya	Road Safety Auditors Certification Course.	Self-funded	January 17th to January 31st, 2024	National	27

### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Prof. T. V. Bharat	Indian Institute of Science, Bangalore	HoC, CET Professor, Department of Civil Engineering, IIT Guwahati	Behavior of unsaturated soils during infiltration & drainage *Settlement behavior of ultra-soft soils and mine tailings *Contaminant transport through landfill liners *Mineralogical aspects of clays *Inverse analysis of geotechnical & geoenvironmental engineering problems
*Faculties are not engaged at CET. HoC, CET as Coordinator coordinates several programs and runs several projects with different project investigators.				

## **School of Agro and Rural Technology**

**YEAR OF ESTABLISHMENT OF THE SCHOOL:** 2016

**ACADEMIC PROGRAMMES OFFERED:** M.Tech and PhD

### **LABORATORY FACILITIES**

- **Agro-Eco Technology Laboratory:** PI: Prof. Sudip Mitra, Facilities: Gas Chromatography, Digital Flame Photometer, Spectrophotometer, Automated Weather Station.
- **Food and Bioprocess Laboratory:** PI: Dr. Siddhartha Singha, Facilities: Fibre Analyzer, Dehumidifier Dryer, Sieve Shaker.
- **Water and Sanitation:** PI: Dr. Meena Khwairakpam, Facilities: TOC Analyzer, BOD incubator, Digital Nephlo Turbidity Meter.
- **Common Wetlab and Workshop:** Facilities: Kjeldahl Digestion & Distillation Apparatus, Rotary Evaporator, Spectrophotometer, Digital Flame Photometer, Muffle Furnace, Muffle Furnace.
- **School- Central Instrumentation Facility:** HPLC, AAS, UV-VIS Spectrophotometer, Probe Type Ultrasonicator.
- **Microbiology:** Facilities: Incubator, Trinocular stereo zoom and Compound Microscope with camera, deep freezer (80°C), centrifuge, autoclave, orbital shaker with incubator.

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

Flame photometer, Commercial bottling line for beverage (Bio resource complex, DBT), Near NIR spectrophotometer

### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Rural technology, Food technology, Energy, Biosciences and Bioengineering, Civil Engineering, Design, Mechanical Engineering, Humanities and Social Sciences

### **MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT**

- Technology Development and Innovation Engineering for Value Chain Development for Citrus Fruits in North East India (Funded by DBT, Gov. of India)  
Development of a pilot plant for production of high value, flaked/powder and stabilized liquid or infusion type products from wide variety of plants with exotic flavour aroma, bioactivity or functionality from indigenous plants of Hailakandi district, Assam (Funded by DBT, Gov. of India)
- Doubled haploid production (homozygous diploids) in two challenging tree species, Neem (*Azadirachta indica*) and Tea (*Camellia* species) using in vitro androgenic haploids developed in our laboratory. Bioreactor cultivation of in vitro generated high yielding cell lines to scale-up the product and process for producing medicinally important metabolites, like azadirachtin, N-alkylamides, catechins, anthocyanins etc. on commercial scale.



Microscale Fluid Flow, Plant fluidics, LOC applications, Droplet fluidics, Magnetofluidics, Paper Microfluidics.

**CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
01	Dr. Meena Khwairakpam	International Conference on Waste Recycling and Environmental Technology (WRET 2024)	Babasaheb Bhimrao Ambedkar University, Lucknow	8/2/2024-9/2/2024	International
02	Prof. Sanjukta Patra	International Conference on "Recent trends in Engineering and Sciences	Birla Institute of technology, Mesra, Ranchi, Jharkhand, India.	29/03/2024 to 30/03/2024	International
03	Prof. Pranab Kumar Mondal	1st Indian conference on Micro Nano Fluidics: From soft matter to bioengineering (ICOM 2023)	IIT Madras, Chennai, Tamil Nadu	29/09/2023 to 01/10/2023	International
04	Prof. Pranab Kumar Mondal	International conference on recent advances in fluid mechanics and nanoelectronics (ICRAFNM 2023)	MIT Bengaluru, Karnataka, India	12/07/2023 to 14/07/2023	International
05	Prof. Sudip Mitra	3rd International Symposium on Disaster Resilience and Sustainable Development (DRSD 2023),).	Asian Institute of Technology, Bangkok, Thailand	7-8 Dec 2023	International
06	Prof. Sudip Mitra	IDRiM 2023, the 13th International Conference of the International Society for the INTEGRATED DISASTER RISK MANAGEMENT	IIT Roorkee	28-30 Sep 2023	International
07	Prof Ramagopal Uppaluri	Young Scientist, 2023	Vytautas Magnus University, Lithuania	29/03/2023	International
08	Prof Ramagopal Uppaluri	National conference on Underutilized Food Resources: Nutrient Composition, value Addition and Quality Assurance	Mizoram University	25-26/05/2023	National
09	Prof Ramagopal Uppaluri	5th International Symposium on Processing of Food, vegetables and Fruits (ISPFVF 2023)	Kuala Lumpur	22-23/06/2023	International
10	Prof Ramagopal Uppaluri	Molecularly Designed Functional Materials 2023 (MDFM 2023)	India (online)	28-30/09/2023	International
11	Prof Ramagopal Uppaluri	IFCoN 2023	CSIR-CFTRI Mysuru, India	07-10/12/2023	International
12	Prof Ramagopal Uppaluri	Symposium on advancements in staple food fortification 2024 (FortiSF2024)	IIT Kharagpur, India	22-23/02/2024	International

13	Prof Ramagopal Uppaluri	Japan-NER Technology Symposium 2024	Bioeconomic Cooperation	IIT Guwahati, India	03-04/03/2024	International
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### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Prof. Latha Rangan	Plant Flow Cytometry	Sherubtse College, Royal University of Bhutan	Kanglung BHUTAN	29/03/2024
02	Prof. Pranab Kumar Mondal	Plant Root Dynamics: The Role of Microfluidics	Manipal Institute of Technology Bengaluru	Bengaluru, Karnataka	12/07/2023 to 14/07/2023
03	Prof. Sudip Mitra	Climate Smart Agriculture For Sustainable Agroecosystem: Role Of Indigenous Technologies	Royal University of Bhutan	Kanglung BHUTAN	29/03/2024
04	Prof. Sudip Mitra	Panel discussion in the National Workshop on 'Digital data and tools for managing agriculture: Focusing on Earth observation data and Climate Change'	IIIT Bhubaneswar and International Water Management Institute, Srilanka	Bhubeneswar , Odhissa	21-23 Dec 2023
05	Dr. Siddhartha Singha	Collaborative opportunities in Agro Food Value Chain Development	Gifu University.	Japan	10/12/2023-15/12/2023
06	Dr. Siddhartha Singha	Workshop on research design	Sherubtse College, Royal University of Bhutan	Bhutan	06/02/2024-10/02/2024
07	Dr. Siddhartha Singha	Food Science Innovations for Sustainable Rural Development	Department of Rural Development, University of Science and Technology Meghalaya	Meghalaya, India	19/03/2024

### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Dr Joseph Kingston and Dr. Subramanian Perumal	Scientist, DFRL, DRDO	Discussion about ongoing projects of Food and Bioprocessing Lab	08/05/2023	Initiated a MoU
02	Mr. Anuj Sharma	Founder Director of ALSiSAR IMPACT	Empowering Northeastern Entrepreneurs: Local Products, Packaging, and Market Expansion	25/08/2023	Initiated a MoU
03	Mrs. Manjula Saikia Bhuyan	Former Administrative Secretary at Department of Industries &	Importance of Technology in policy-making	07/09/2023	Joined as an advisor for the

		Commerce, Govt. of Assam			B.Tech. program
04	Ms. Tripti Khanna	National Program Head, Gramin Vikas Trust	Rural development and agriculture	07/10/2023	Initiated two developmental projects
05	Sonam Dendup, Pema Wangdi and Sonam Tobgay	Sherubtse College, Royal University of Bhutan	Discussion about ongoing projects of Food and Bioprocessing Lab	18/12/2023	Initiated two developmental projects
06	Prof Hiroyuki Koyama & Dr. Rao with a team of Japanese professors with	Gifu University, Japan	Discussion about ongoing projects of Food and Bioprocessing Lab	05/03/2024	Initiated developmental project
07	Dr. Michio Yamakawa	Professor, Gifu University, Japan	Discussion about ongoing projects of Food and Bioprocessing Lab	14/03/2024	Initiated one developmental project

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International / National	No. of participants
01	Dr. Siddhartha Singha	9-month Social-Start Up Fellowship Programme 2023,	School for Social Entrepreneurs (SSE), India	15/01/2023-29/10/2023	National	30
02	Dr. Siddhartha Singha	Awareness Program at M. A. Senior Secondary School, Lala.	DBT, Gov of India	29/02/2024	National	55
03	Dr. Siddhartha Singha	North East Green summit	Vibgyor N.E Foundation	10/03/2024	International	500
04	Dr. Siddhartha Singha	Awareness Programme On Bioresources of Hailakandi district: Promoting Bioentrepreneurship	DBT, Gov of India	28/03/2024	National	50

#### AWARDS AND HONOURS

- Prof. Ramagopal Uppaluri: Best Oral Presentation; 5th International Symposium on Processing of Food, vegetables and Fruits (ISPFVF 2023), University of Nottingham, Kuala Lumpur, Malaysia.
- Prof. Ramagopal Uppaluri: Best poster presentation; Symposium on advancements in staple food fortification 2024 (FortiSF2024), IIT Kharagpur.

#### STUDENTS' ACHIEVEMENTS

- Ms. Silvia Saikia: Best Oral Presentation award; Sardar Swaran Singh National Institute of Bio-Energy.
- Ms. Silvia Saikia: Best paper award; National Institute of Technology, Meghalaya.
- Ms. Anamika Ghose, Mr. Debaditya Gupta: Vishwakarma award (Top 7 finalist); Maker Bhavan Foundation.

- Mr. Debaditya Gupta: 1<sup>st</sup> position in oral presentation; Society for Fertilizers and Environment.
- Mr. Ankit Kumar: Best paper; Department of environmental science, Babasaheb Bhimrao Ambedkar University (Central University), Lucknow, India.
- Mrs. Kumudhini Akasap: Best Oral Presentation; 5<sup>th</sup> International Symposium on Processing of Food, Vegetables and Fruits (ISPFVF 2023), University of Nottingham, Kuala Lumpur, Malaysia.
- Mr. Amey Mindewar: Best thesis award; IIT Guwahati
- Dr. Heena Kauser: Best thesis award; IIT Guwahati.

#### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Prof. Latha Rangan	UNIVERSITY OF MADRAS	Professor (HAG)	APPLIED BIODIVERSITY
02	Prof. Rakhi Chaturvedi	University of Delhi, India	Professor (HAG)	Plant Tissue Culture & Secondary Metabolites Production
03	Prof. Sanjukta Patra	Central Food Technological Research Institute, Mysore	Professor	Enzyme and Microbial Technology; Biosensors; Metagenomics; Environmental Biotechnology, Rural health and agrowaste utilisation
04	Prof. Ramgopal V.S. Uppaluri	University of Manchester, UK	Professor (HAG)	Advanced Food Processing, Rural food product development, Machine learning based crop prediction, Nanotechnology, Green Concrete, Value Added products from Agro-waste
05	Prof. Ajay Kalamdhad	Indian Institute of Technology Roorkee	Professor	Solid waste management Mechanical composting and vermicomposting Anaerobic digestion Analysis of solid wastes Microbiology of composting Biosorption Water & wastewater Treatment
06	Prof. Sudip Mitra	Indian Agricultural Research Institute (IARI), New Delhi	Associate Professor	Climate Smart Agriculture, Soil Quality and Natural Resources Management
07	Dr. Siddhartha Singha	Indian Institute of Technology Madras	Assistant Professor	Food Processing Technologies, Process biotechnology, Scale up and commercialization strategies in food- and bio-processing
08	Dr. Meena Khwairakpam	Indian Institute of Technology Roorkee	Associate Professor	Rural Sanitation, Waste Management, Constructed Wetland, Biological transformation of organic waste, waste to wealth
09	Dr. Sagar Surendra Deshmukh	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	Assistant Professor	Agribusiness Management, Agribusiness Incubation, Entrepreneurship Development

**School of Buisness**

**YEAR OF ESTABLISHMENT OF THE SCHOOL:** 2022

**ACADEMIC PROGRAMMES OFFERED:** MBA, Ph.D.

### **LABORATORY FACILITIES**

**No. of Laboratories:** 02 (Finance Laboratory and Scholars' Lab.)

**Finance Laboratory:** The Finance Laboratory in the School of Business was set-up to undertake cutting edge research on financial markets using real time high frequency data. Here the students can apply their theoretical knowledge to real-world scenarios, thereby bridging the gap between academia and industry.

Presently the Laboratory is equipped with 20 workstations with SPSS (Statistical Package for Social Sciences) software installed in it.

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

Computing Units: 21 Nos.

SPSS (Statistical Package for Social Sciences): 10 user license

Laptop: 02 Nos.

Printer: 07 Nos.

Projector: 01 No.

Modular Desking System: 13 Nos.

Workstation Chair: 30 Nos.

Pigeon Hole: 01 No.

LFC: 02 Nos.

### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Organizational Behaviour, Human Resource Management, Operations Management, Marketing Management, Financial Management, Project Management, Information System.

### **CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

<b>Sl. No.</b>	<b>Name of Faculty</b>	<b>Name of Conf./Workshop</b>	<b>Place</b>	<b>Date</b>	<b>International/ National</b>
1.	Dr. Sparsh Johari	The 11th World Construction Symposium (WCS) 2023	Colombo, Srilanka	21/07/2023	International
2.	Dr. Sumant Kumar Bishwas	3rd Pritam Singh Memorial (PRISM) Conference	BIMTECH Noida	17/11/2023	National

3.	Dr. Sumant Kumar Bishwas	INDAM 2024 CONFERENCE	Goa Institute of Management, Goa	11/01/2024	National
4.	Dr. Kuldeep Baishya	<i>S-Team Conference</i>	Organized by Symbiosis Centre for Management and Human Resource Development in collaboration with EM Normandie Business School (Attended online)	13/09/2023	International
5.	Dr. Kuldeep Baishya	<i>Research Symposium on Finance and Economics 2023</i>	IFMR graduate school of business	15/06/2023	National

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1.	Dr. Sparsh Johari	Workforce management in construction	Sardar Vallabhbhai National Institute of Technology Surat	Surat, India	01/06/2023
2.	Dr. Sparsh Johari	Enhancing diversity and inclusion of workers in the construction industry	King Fahad University of Petroleum & Minerals (KFUPM)	Dammam, Saudi Arabia	10/11/2023
3.	Dr. Sparsh Johari	Occupational health and safety implications of an aging workforce in construction	Assam Engineering College	Guwahati, India	10/01/2024
4.	Dr. Sumant Kumar Bishwas	Flexible HR, Social Media, and Employer Branding	DRDO Annual HRD Coordinators Meet	DRL, Tezpur	16/09/2023
5.	Dr. Abraham Cyril Issac	Where is the Time to Innovate?	HYUNDAI Motor India Ltd.	Chennai	12/04/2023
6.	Dr. Abraham Cyril Issac	Bringing the backbenchers to the front without pushing the front ones back	SFS Bahalpur	Assam	29/04/2023
7.	Dr. Abraham Cyril Issac	Sensitivity at the workplace: the unrecognized superpower	Regional Educational Seminar of SFS schools	Shillong	03/05/2023
8.	Dr. Abraham Cyril Issac	Billing Schedule and Cash flow management & Procurement and Negotiation in Project Management	TIDF, IIT Guwahati	IIT Guwahati	15/07/2023
9.	Dr. Abraham Cyril Issac	Chief Guest of the 77th Independence Day celebrations of India	St. Anthony's School, Guwahati	Guwahati	15/08/2023
10.	Dr. Abraham Cyril Issac	Importance of Theoretical Contribution in a Research paper	International School of Business and Media Pune	Pune	16/07/2023

11.	Dr. Abraham Cyril Issac	Morphological Analysis	IIT Madras	Chennai	15/09/2023
12.	Dr. Abraham Cyril Issac	Literature review through a Morphological approach	School of Management Studies, University of Hyderabad	Hyderabad	06/10/2023
13.	Dr. Abraham Cyril Issac	No Time for Academics	Assam Engineering College (Faculty Development Program on "Sustainable Environment - An Engineering Perspective" (SEEP: 2024))	Guwahati	09/01/2024
14.	Dr. Abraham Cyril Issac	Nemesis of Psychological Safety	Assam Engineering College (Faculty Development Program on "Sustainable Environment - An Engineering Perspective" (SEEP: 2024))	Guwahati	12/02/2024
15.	Dr. Abraham Cyril Issac	Authenticity at work: The Precursor to Human Potential Realization	INAE-SERB Workshop	IIT Guwahati	16/03/2024
16.	Dr. Abraham Cyril Issac	Using Software Tools for Qualitative Analysis	Tata Institute of Social Science	Guwahati	21/03/2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Shri Paban Kumar Borthakur	Chief Secretary to the Government of Assam	Management as a State Craft - lessons from life	23/03/2024	Interactive session with Students and SOB Faculty

#### AWARDS AND HONOURS

- Dr. Sumant Kumar Bishwas : Best Paper Award; PRISMA Society and BHIMTECH, Noida.
- Dr. Sumant Kumar Bishwas: Session Chair; IIM Bodhgaya and GIFT Society.
- Dr. Sumant Kumar Bishwas: Session Chair; Chaired one session in International HR Conference Cum Conclave; IIM Jammu.
- Dr. Kuldeep Baishya: Best Paper Award; *S-Team Conference* organized by Symbiosis Centre for Management and Human Resource Development in collaboration with EM Normandie Business School.
- Dr. Kuldeep Baishya: Session Chair; 3<sup>rd</sup> International Marketing Conference organized by IIM Shillong.



## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
<b>Head of the School</b>				
1.	Prof. Sukhomay Pal	Indian Institute of Technology Kharagpur	Professor	Operations Management, Applications of Artificial Intelligence in Manufacturing Industry, Industry 4.0
<b>Permanent Faculty</b>				
2.	Dr. Abraham Cyril Issac	IIT Madras & Swinburne University of Technology Melbourne	Assistant Professor	Organizational Behavior, Human Resource Management, Knowledge Management, Macroeconomics
3.	Dr. Kuldeep Baishya	IIM Shillong	Assistant Professor	Marketing, Technology Adoption, Business Simulation
4.	Dr. Sumant Kumar Bishwas	IIT Delhi	Assistant Professor	HRM, OB, Performance and Compensation Management, IR and Labor Law, Flexible HR-WFH, Social Media and HR Analytics, Green HRM, Organization Vitality
5.	Dr. Abhay Pant	IIM Indore	Assistant Professor	Economics & Finance
<b>Adjunct Faculty</b>				
6.	Prof. Nachiketa Tripathi	IIT Kanpur	Professor	Organizational Behaviour, HRM and Social Psychology
7.	Prof. Siddhartha Pratim Chakrabarty	University of Illinois at Chicago, Chicago, USA	Professor	Business, Finance, Data Science, Statistics, Sustainable Development Goals and Mathematics
8.	Dr. Sparsh Johari	IIT Delhi	Assistant Professor	Construction Project Management, Workforce Management, Capacity Building, Skill Development Training, Construction Productivity, Project Performance, Risk Management, Construction Quality, Safety, and Health
<b>Associate Faculty</b>				
9.	Prof. Rajshree Bedamatta	Indian Statistical Institute	Professor	Agrarian Studies, rural labour markets, Food Security, Food Sovereignty movements, nutrition and public health, education
10.	Prof. Laishram Boeing Singh	IIT Madras	Professor	Project Planning and Control, Public Private Partnerships, Risk Management, Infrastructure Financing, Construction Management and Construction Informatics

11.	Prof. Pratul Chandra Kalita	Indian Institute of Technology Guwahati	Professor	Design Management, Design Methods, Systems Approach to Design, Design for Development
12.	Prof. Sanasam Ranbir Singh	IIT Madras	Professor	Open Source Intelligence (Social Media/Social Network Analysis), Information Retrieval, NLP
13.	Dr. Deepak Sharma	Indian Institute of Technology Kanpur	Associate Professor	Optimization and soft computing techniques for design and manufacturing, Industry 4.0
14.	Dr. Bodhisattva Sengupta	McGill University, Montreal	Associate Professor	Public Economics and Policy, Dynamic Economic Theory
15.	Dr. Prakash Kotecha	IIT Bombay	Associate Professor	Computational Intelligence Algorithms, Optimization, Operations Research
16.	Dr. Agnirup Sarkar	Durham University	Assistant Professor	Macroeconomics, Monetary Economics, Finance

**Mehta Family School of Data Science and  
Artificial Intelligence**

**YEAR OF ESTABLISHMENT OF THE SCHOOL: 2021**

**ACADEMIC PROGRAMMES OFFERED:**

- B.Tech in Data Science and Artificial Intelligence
- B.Sc. (Honours) in Data Science and Artificial Intelligence
- MTech in Data Science (Jointly with EEE and Mathematics Departments)
- PhD

**MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

- MFP LaserJet printer (6 Nos)
- M5 Stack Core2 ESP32 IoT Development Kit (35 Nos)
- Raspberry Pi 5 Development Kit (11 Nos)

**MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

- Wireless communication and machine learning
- Face and eye tracking using computer vision
- Biomedical image segmentation using deep learning
- Neuromorphic Computing
- Deep Learning for sensor
- ML/DL for Audio, Healthcare
- ML/DL for Neuroscience and Signal Processing
- Statistical Signal Processing

**CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL**

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/National
1	Dr. Rhythm Grover	2023 IMS International Conference on Statistics and Data Science (ICSDS)	Lisbon, Portugal	18-12-2023 to 21-12-2023	International
2	Dr. Chiranjib Sur	Embracing AI in Engineering: Industry, Academia, and Upskilling for Success	Guwahati	28-02-2024	National

**INVITED LECTURES OF FACULTY: IN INDIA, ABROAD**

Sl.No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
01	Dr. Rhythm Grover	Probability In NLP-ML-AI Lecture Series, CFILT, IIT Bombay	CFILT, IIT Bombay	Online	24-06-2023

02	Dr. Arghyadip Roy	Machine Learning in Resource Allocation for Wireless Network	Center for Intelligent Cyber Physical System (CICPS) and Technology Innovation Hub (TIH) division of IITG TIDF	IIT Guwahati	05-07-2023
03	Dr. Debanga Raj Neog	Generative AI and Biomedical Imaging	York University	York, Canada	06-07-2023
04	Dr. Debanga Raj Neog	Artificial Intelligence in Healthcare	CPMS College of Nursing	Guwahati	26-08-2023
05	Dr. Debanga Raj Neog	Emerging Technology (Cyber Physical System)	iHUB DivyaSampark, Technology Innovation Hub (A joint initiative of DST Govt. of India and IIT Roorkee)	Purnea, Bihar	02-09-2023
06	Dr. Teena Sharma	Panel Speaker	Careers in Data Science & Artificial Intelligence, BSc (Hons) in Data Science and Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	13-09-2023
07	Dr. Neeraj Kumar Sharma	Panel Speaker	Careers in Data Science & Artificial Intelligence, BSc (Hons) in Data Science and Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	13-09-2023
08	Dr. Teena Sharma	Invited Talk	One Week Faculty Development Program on Artificial Intelligence for Sustainable Development, Babu Banarasi Das University, Lucknow, India	Department of Computer Science and Engineering, Babu Banarasi Das University, Lucknow, India	03-10-2023
09	Dr. Debanga Raj Neog	Hands-on Workshop on Image Processing	Royal Global University	Guwahati	09-11-2023

10	Dr. Debanga Raj Neog	Efficient Inferencing in Resource Constrained Devices	Assam Agricultural University	Jorhat	24-11-2023
11	Dr. Teena Sharma	Invited Lecture	Professional Development Workshop for delegates from the Royal University of Bhutan, Mehta Family School of Data Science & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	18-12-2023
12	Dr. Neeraj Kumar Sharma	Invited Lecture	Professional Development Workshop for delegates from the Royal University of Bhutan, Mehta Family School of Data Science & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	18-12-2023
13	Dr. Debanga Raj Neog	Image Processing and CNN for the Royal University of Bhutan delegates	IIT Guwahati (Talk is for the Royal University of Bhutan delegates)	Guwahati	22-12-2023
14	Dr. Debanga Raj Neog	Workshop on Research Design	Sherubtse College, Royal University of Bhutan	Kanglung, Bhutan	07-02-2024
15	Dr. Rhythm Grover	13th Conference of Law Officers of Reserve Bank of India	Reserve Bank of India	Kaziranga	02-03-2024
16	Dr. Debanga Raj Neog	Generative AI and its Application	Tezpur University	Tezpur	08-03-2024
17	Dr. Teena Sharma	Guest Lecture	Mehta Family School of Data & Artificial Intelligence Training Program for Officers/Engineers/Staff of Northeast Frontier Railways, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT)	18-03-2024

				Guwahati, India	
18	Dr. Rhythm Grover	Guest Lecture	Mehta Family School of Data & Artificial Intelligence Training Program for Officers/Engineers/Staff of Northeast Frontier Railways, Indian Institute of Technology (IIT) Guwahati, India	Mehta Family School of Data & Artificial Intelligence, Indian Institute of Technology (IIT) Guwahati, India	18-03-2024
19	Dr. Ayon Borthakur	Guest Keynote Speaker	AIMLSys 2023	Bangalore	28-10-2023
20	Dr. Ayon Borthakur	Plenary Talk	National Seminar on Mathematical Applications in Data Science and Artificial Intelligence. Guwahati University	Guwahati	22-12-2023
21	Dr. Chiranjib Sur	Plenary Talk: Data Science: From Ancient India to Large Language Models	National Seminar on Mathematical Applications in Data Science and Artificial Intelligence. Guwahati University	Guwahati	22-12-2023
22	Dr. Chiranjib Sur	Invited Talk: Demystifying LLMs	Assam AI Initiative (AAII)	Online	25-02-2024

**VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES**

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date	Remarks
01	Dr. Prabhat Kumar Mishra	Massachusetts Institute of Technology (MIT), US	Constrained Estimation and Control	25-05-2023	Online talk

02	Dr. Ganesh Bagler	Indraprastha Institute of Information Technology Delhi	Making food computable	04-08-2023	Online talk
03	Dr. Harish Katti	National Institute of Health, Baltimore, US	Are you from North or South India? Analyzing systematic representational differences between humans and machines	12-09-2023	Online talk
04	Dr. Gasper Begus	University of California Berkely, US	Modelling language from raw speech with GANs	13-09-2023	Online talk
05	Dr. Srinivasa Narashimhan	Carnegie Mellon University, Pittsburgh, US	Making ordinary cameras extraordinary	11-10-2023	Online talk
06	Sr. Sarab Sethi	Imperial College London, UK	Automating biodiversity monitoring using soundscapes	18-10-2023	Online talk
07	Dr. Nadine Lavan	Queen Mary University of London, UK	Who's that? Person perception from voices	07-11-2023	Online talk
08	Sai Gunaranjan Pelluri	Renesas Electronics	Pixels with Purpose: Revolutionizing Imaging RADARS through Signal Processing and Machine Learning	29-12-2023	In-person talk
09	Prof. Nalini Ravishanker	University of Connecticut, Storrs, CT, USA	IoT Data Analysis: Learning and Anomaly Detection	4-01-2024	Offline
10	Prof. Nalini Ravishanker	University of Connecticut, Storrs, CT, USA	Ensemble Hindcasting of Coastal Wave Heights	5-01-2024	Offline
11	Prof. Nandini Kannan	Dean Academics and Director, Data Science Institute, Plaksha University	Data Science, Artificial Intelligence, and Society: Adapting to a rapidly changing world	5-01-2024	Offline
12	Dr. Mehrdad Moharrami	University of Iowa, USA	A Policy Gradient Algorithm for the Risk-Sensitive Exponential Cost MDP	23-01-2024	Online talk
13	Dr. Aravind Ganapathiraju	Uniphore Systems	ASR and NLP are Solved Problems, Are They?	05-04-2024	Online talk

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
01	Dr. Rhythm Grover (Co-organiser with	Summer School for women in Mathematics and Statistics 2023	International Centre for	29-05-2023 to 9-06-2023	National	65



	Prof. Siva Athreya and Dr. Dootika Vats)		Theoretical Sciences, ICTS, TIFR			
02	Dr. Chiranjib Sur	AI based "Professional Development Workshop"	Royal University of Bhutan	18-12-2023 to 23-12-2023	National	25
03	Dr. Chiranjib Sur	"Human Resource Empowerment towards use of Artificial Intelligence, Data Science, Digital Tools for Enhancing Organizational Functionality"	NFR	18-03-2024 to 22/03/2024	National	30

### AWARDS AND HONOURS

- Dr. Debanga Raj Neog: Young Scientist Award 2023; Assam Science Technology and Environment Council under Science, Technology and Climate Change Department, Government of Assam.
- Dr. Teena Sharma: Outstanding Reviewer; IEEE Transactions on Neural Networks and Learning Systems (TNNLS), IEEE Computational Intelligence Society (CIS).
- Dr. Teena Sharma: Associate Editor; IEEE Transactions on Artificial Intelligence (TAI), IEEE Computational Intelligence Society (CIS).

### STUDENTS' ACHIEVEMENTS

- Vikky Masih: Second prize in INAI Data Analytics Challenge on Road Safety 2023; INAI (IIIT Hyderabad), iHub-Data (IIIT Hyderabad), Transportation Research Group of India (TRG) and CSIR-CRRI.

### FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Ratnajit Bhattacharjee	Jadavpur University, Kolkata	Professor EEE & Head, MFSDSAI	Microwave Engineering, Microstrip Antennas, Electromagnetics, Wireless Communication
02	Rhythm Grover	IIT Kanpur	Assistant Professor	Efficient Algorithms for parameter estimation of signal processing models, Statistical properties of classical parameter estimation methods, Robust methods of

				parameter estimation in presence of outliers in the data.
03	Teena Sharma	IIT Kanpur	Assistant Professor	Artificial Intelligence, Machine Learning, and Deep Learning Algorithms and their applications to Computer Vision: Object detection, Classification, Identification, Recognition, Image enhancement, Image matching; Equitable Precision Medicine: Transfer learning, Meta-learning, Few-shot learning; and Condition-based Monitoring: Fault diagnosis and remaining useful life prediction
04	Amulya Kumar Mahto	IIT Patna	Assistant Professor	Statistical Modelling, Accelerated Life Testing, Competing Risks, Multicomponent Stress-Strength Reliability, Statistical Optimization, Classical and Bayesian Estimation.
05	Arghyadip Roy	IIT Bombay	Assistant Professor	Optimization and Control of Stochastic Systems, Reinforcement Learning, Markov Decision Process, Multi-armed Bandit, Stochastic Approximation, Resource Allocation in Communication Networks, Application of Reinforcement learning in Wireless Communication.
06	Ayon Borthakur	Cornell University, US	Assistant Professor	Embedded AI systems, Deep learning, Neuromorphic computing, Computational neuroscience.
07	Chiranjib Sur	University of Florida, US	Assistant Professor	Deep Learning, NLP/NLU, Recommendation Systems for Multimedia, Image/Video Captioning, Story Telling, Questioning Answering, Translation, Visual Questioning Answering, Statistical Learning, Image to Image Transformation, Segmentation and Organ detection, Object Detection, Scene Understanding, Multi-Frame Prediction, Scalable Big Data Technologies
08	Debanga Raj Neog	Univ. British Columbia Vancouver, Canada	Assistant Professor	Machine learning and Deep Learning (Object tracking and localization, stereo reconstruction), Image Processing (Semantic segmentation, biomedical image processing), Computer Vision (Eye tracking, face tracking), Computer Graphics and AR/VR (Facial animation, anatomical augmented reality), Computational

				Imaging (High dynamic range imaging).
09	Neeraj Kumar Sharma	Indian Institute of Science, Bangalore, India	Assistant Professor	Multi-modal data science, machine learning, and artificial intelligence, Speech, Audio, EEG, and Wearable Signal Processing and ML, Rock structure analysis using imaging, wearables, and healthcare
10	Prashant W. Patil	IIT Ropar, India	Assistant Professor	Research interests: Computer Vision, Deep Learning, Multi-weather Image/Video Restoration, Video Object Segmentation, Single Image Depth Estimation, Image/Video Super-resolution, Video Object Tracking, Activity Recognition.

#### ASSOCIATE FACULTY

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
1	Girish Sampath Setlur	University of Illinois at Urbana Champaign, USA	Professor, Physics	Theoretical Condensed Matter Physics, Understanding and accounting for the properties of everyday bulk materials from a knowledge of the fundamental constituents of the substance and the fundamental physical laws governing those constituents.
2	Prabir Kumar Saha	IIT Madras, India	Professor, Chemistry	Process Modelling, Optimization and control, Membrane Based separation Process.
3	Arabin Kumar Dey	IIT Kanpur, India	Associate Professor, Mathematics	Distribution models and its applications, Statistics and Finance, Speech signal processing, Machine learning algorithms
4	Ashok Kumar Sairam	IIT Guwahati, India	Professor, Mathematics	Computer networks, network security, software defined networks, crowd sourcing techniques, and location based privacy.

5	Siddhartha Pratim Chakrabarty	University of Illinois at Chicago, Chicago, USA	Professor, Mathematics	Mathematical Finance - computational aspects of pricing, sustainable (green) finance, portfolio theory, financial risk management, actuarial mathematics and data science, and Mathematical Biology - deterministic, stochastic and control theoretic approaches, in modelling of biological phenomenon.
6	Vibin Ramakrishnan	IIT Bombay, India	Professor, Biosciences & Bioengineering	Understanding the efficacy and mode of action of drugs, design & development of advanced materials
7	Ashish Anand	NTU, Singapore	Professor, CSE	Natural Language Processing (NLP), Biomedical Text Mining, Computational Biology, Deep Learning
8	Sanasam Ranbir Singh	IIT Madras, India	Professor, CSE	Information Retrieval, Web Mining, Complex network analysis, Social Computing, Machine Learning and Data Mining on Social Media Data, (Multi-Lingual) Natural Language Processing
9	Gaurav Trivedi	IIT Bombay, India	Associate Professor, EEE	Circuit Simulation (Analog, RF & Digital) and VLSI CAD, Electronics System Design, Computer Architecture, Semiconductor Devices, Hardware Security, Embedded Systems and IoT, High Performance Computing, Large Scale Optimization and Machine Learning.
10	Hanumant Singh Shekhawat	University of Twente, Netherlands	Assistant Professor, EEE	Machine learning, System Theory, Applied Mathematics, Healthcare, & Signal Processing.

11	Manas K. Bhuyan	IIT Guwahati, India	Professor, EEE	Machine Learning and Artificial Intelligence, Image/Video Processing, Computer Vision, Human Computer Interactions (HCI), Virtual Reality & Augmented Reality, and Biomedical Signal Processing.
12	Suresh Sundaram, Associate Professor, EEE	IISc Bangalore, India	Associate Professor, EEE	Pattern recognition, Image/ Video Processing and Computer Vision.
13	Shyamanta M. Hazarika	University of Leeds, England	Professor, Mechanical	Cognitive Systems, Knowledge Representation and Reasoning, Artificial Intelligence, Biomimetic Robotics, Machine Learning, Robotic Neurorehabilitation.
14	Ribhu Chopra	IIT Roorkee, India	Assistant Professor, EEE	Signal Processing for wireless communications, Statistical Signal Processing, Detection and Estimation, Federated Learning, Wireless for Machine Learning.

# School of Energy Science and Engineering

**YEAR OF ESTABLISHMENT:** The School of Energy Science and Engineering (SESE), renamed from Centre for Energy in April 2021, aims to address the National Education Policy (NEP) and connect technology development to training and grassroots outreach in order to address specific Sustainable Development Goals (SDGs), with a primary focus on Quality Education, Affordable Clean Energy, Sustainable Cities and Communities, Climate Action, and Partnership for the Goals. The school foresees providing multidisciplinary integrated education across different disciplines to bridge gaps amongst Academia, Humanities, Science, Engineering, Economics, Management, and Policymaking by introducing interdisciplinary programs. The school endeavours to enhance its outreach efforts through short-term training programs, entrepreneurship promotion workshops and translational research initiatives.

**ACADEMIC PROGRAMMES OFFERED:** [a] PhD, [b] MS by Research [c] B.Tech. in Energy Engineering

### **LABORATORY FACILITIES:**

**No. of Laboratories: Research: 11 (PG), Instructional: 3 (UG), Project: 1**

### **RESEARCH LABORATORIES**

- **Analytical Laboratory:** Centre for Energy houses a proper state of the art analytical set-up for quantitative as well as qualitative analysis of samples like biomass and biofuels. Some of the tests that can be performed here are -Characterization of fuels (calorific value, viscosity, flash point, fire point, cloud & pour point, cetane index), Proximate as well as ultimate analysis, etc. The laboratory is equipped with Gas Chromatograph (GC), Thermo-Gravimetric Analyzer (TGA), Differential Scanning Calorimetry (DSC), High Performance Liquid Chromatograph (HPLC), Oxygen bomb calorimeter, Vacuum rotary evaporator, Lyophilizer etc. to name a few.
- **Biofuel Laboratory:** The Biofuel Laboratory is primarily focused in developing a sustainable process design for various biofuel productions and its bioconversion to various value added byproducts. The various types of facilities available in this laboratory are: Development of thermo-chemical and biochemical conversion routes to efficiently generate renewable biofuels (Bio-butanol, Bio-ethanol) from various feedstock types – rice straw, glycerol, lignocelluloses, Microalgae and *Jatropha* (Bio-diesel production); Ultra Sound enhanced conversion of sugars to fuels and chemicals; Glycerol bioconversion to various value added product (1, 3-Propanediol, DHA); Biohydrogen production. Development of facilities for studying the conversion of methane to methanol and other value added products are underway.
- **Fuel Cells Laboratory:** Study of fuel cells has assumed immense importance because fuel cells have many advantages - clean, high efficiency, silent / vibration-free, reliable, responsive, high quality power, unlimited runtime, independence from traditional infrastructure, use a variety of fuels, high power density, variable operating temperatures, complementary technologies, design flexibility etc. The laboratory is emphasizing on microbial and enzymatic fuel cell as an alternative source of energy and power generation. In this endeavor, researchers in the lab have actively worked in enzymatic fuel cell with alcohol oxidase in bionanode and laccase in biocathode. We are also carrying out work in PMFC i.e. photosynthetic microbial fuel cell using cyanobacteria and other photosynthetic bacteria in anode as a means of self-sustainable power generating profile for a clean, green energy initiative and technology for the future. Some significant achievements of this lab are identification of novel signal forms in biofuel cell for detection of alcohol and Cyanobacteria based microbial fuel cells for dye degradation and power production. Facilities available in this laboratory are: Fabrication and characterization of bioelectrodes for biofuelcell and biosensors applications, Facility for development and characterization of composite proton exchange membranes for fuel cell applications, Table top spin coating unit, Potentiostat for cyclic voltametric study, amperometric study and other electrochemical measurements.
- **Energy Efficiency Laboratory:** Some of the facilities available in this laboratory are Fuel testing equipment (calorific value and viscosity), equipment for proximate analysis, anemometer, pump testing setup, biomass gasification unit, flue gas analyzer, GC for biogas analysis, natural

convection grain drier, fibre analysis system, Kjeldahl apparatus for nitrogen estimation, fume hood etc. A portion of the energy efficiency laboratory is located in the technology complex (TC) to house the noisy, rugged and robust facilities like biomass gasifier units, pump testing set-up etc.

- **Bio-energy Laboratory:** The Bioenergy laboratory is developing the necessary knowledge and range of technologies to improve biofuel crops with more efficient biofuel and bioenergy. The lab is also involved in development of micropropagation technology for commercial scale production of clonal (genetically identical) plant materials of high yielding biofuel plants. The laboratory is also planning to employ automation (using bioreactor) in micro-propagation to further reduce the cost of clonal plants. The main research activities in the area of bioenergy involves the following -Micropropagation and Genetic Engineering of Bio Fuel plants, Tissue culture of energy and bio-fuel crops, Bioprocess Engineering for yielding value added products, Genetic Engineering, Extraction of oil and other value added products, and Microalgae based biodiesel production.
- **Solar Energy Laboratory:** Centre for Energy also houses a solar energy lab for dedicated research towards development and testing of thin films for solar cells. Demonstration unit for efficient use of solar energy; characterization and study of the photovoltaic module; energy spectrum measuring facility; solar simulator; spectral response/ photoconductivity/ quantum; efficiency and other transport measurements in the presence of light of photovoltaic modules, materials and devices. The transport measurements are also possible as a function of temperature in the temperature range 250-450K. A facility for preparation of thin films by physical vapor deposition method is also available. The facility for the fabrication of thin film and hetero junction solar cells based amorphous and microcrystalline silicon is also available in collaboration with Physics department.
- **Process Development Laboratory:** This laboratory has been developed at the Technology Complex (TC) to house the noisy, rugged and robust equipment. The major facilities in Process Development Lab are Gasification units (both Downdraft & Fluidized Bed), IC Engines setup, Battery testing facility, 1KW Solar wind hybrid system, Pump testing setup, and Gas to Liquid conversion setup. Some of the equipment available are Gas analyzer, Pelletizer, Gas Chromatograph, Fibre analysis system, etc.
- **Internal Combustion Engine Laboratory:** This laboratory is located at Technology Complex and houses facility for testing of various alternative fuels for modifying and developing petrol and diesel engines.
- **Energy Conversion Laboratory:** This laboratory is housed in Technology Complex wherein research facilities for fuel cell testing, energy storage setup (both battery and compressed air energy storage) and indoor solar testing setups are available.
- **Printed Electronics and Emerging Technology Laboratory:** The lab focuses on developing functional nanomaterials for energy storage and fabrication of printed electronic devices and IoT enabled sensors. Development of AI and machine learning tools for energy generation and distribution.
- **Sustainable Biofuel Laboratory, SESE, Technological Complex:** Research work focus on biofuel production from lignocellulosic agriculture wastes.

## INSTRUCTIONAL LABORATORIES

Three new instructional laboratories have been established for the B.Tech. programme:

- **Thermo-Fluid and Heat Transfer Laboratory:** Houses numerous equipment to support B.Tech laboratory course structure related to Thermo-Fluid and Heat Transfer. The experimental facilities currently available in the laboratory are- Bernoulli's Theorem Proof, Boiling and Condensation, Convective Heat Transfer Experiment, Determination of Stefan Boltzmann's Constant, Determination of Thermal Conductivity of a Composite Wall, Hydraulic Coefficient of Venturimeter, Orificemeter and Pitot Tube, Investigation of Performance Characteristics of a 2-Stage Air Compressor, Reynold's Number Determination, and Vapour Compression Refrigeration Cycle.



- **Energy Materials and Device Fabrication Laboratory:** This B.Tech laboratory aims to give new knowledge to B.Tech on emerging areas of energy storage and conversion devices. Experimental facilities currently established are: Fabrication of nano materials for energy storage and conversion, Fuel-cell to study the kinetics and thermodynamics, Battery Thermal Management Systems, and Assembly and Study of Electrolyzer.
- **Solar & Wind Laboratory:** Houses numerous equipment to support B.Tech laboratory course structure related to Solar & Wind Laboratory. The experimental facilities currently available in the laboratory are- DC-DC Bidirectional Converter, Buck Converter, Regulated DC Power Supply, MPPT Boost Converter, Grid Connected Inverter, Grid Connected Solar PV System, DFIG Based Wind Energy Conversion System, and SYNDEM Smart Grid Kit.

### **PROJECT LABORATORY**

- **Biogas Development and Training Centre (BDTC)** is in project mode, funded by the Ministry of New and Renewable Energy (MNRE), New Delhi for implementation of Biogas Programme under the Umbrella scheme of National Bio Energy Programme. The centre is involved with activities such as: Training & motivation to different categories for popularization of biogas utilization, Creation of a cadre of turnkey workers/private entrepreneurs in rural areas for setting up of biogas plants on turnkey basis and providing post installation servicing of plants as a self-employed vocation, Creation of a cadre of masons and technician skilled in the construction and maintenance of biogas plants, Awareness generation amongst state level policy makers, administrators and planners about the national importance and promotion of biogas technology in rural areas, Field survey of existing biogas digesters in NE region and create a data base, R&D in the field of biogas technology, Serving as forum of exchange of field orientation information and experiences among senior District level functionaries, Coordinating among various agencies and organizations including the State Nodal Agencies, which are directly involved in the implementation of biogas programme, providing consultancy services to manufacturers, NGOs etc. for developing and testing of new systems, and Installation of biogas digesters at subsidized rates , as per MNRE subsidy rate.

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

During the period April 1, 2023, to March 31, 2024, numerous equipment were purchased for the establishment of the Thermo-Fluid and Heat Transfer Laboratory, Energy Materials and Device Fabrication Laboratory, and the Solar & Wind Laboratory for the B. Tech. programme at SESE. The equipment purchased during the current fiscal year and the facilities created are-Bernoulli's Theorem Proof, Boiling and Condensation, Convective Heat Transfer Experiment, Determination of Stefan Boltzmann's Constant, Determination of Thermal Conductivity of a Composite Wall, Hydraulic Coefficient of Venturimeter, Orificemeter and Pitot Tube, Investigation of Performance Characteristics of a 2-Stage Air Compressor, Reynold's Number Determination, and Vapour Compression Refrigeration Cycle, Fabrication of nano materials for energy storage and conversion, Fuel-cell to study the kinetics and thermodynamics, Battery Thermal Management Systems, and Assembly and Study of Electrolyzer, DC-DC Bidirectional Converter, Buck Converter, Regulated DC Power Supply, MPPT Boost Converter, Grid Connected Inverter, Grid Connected Solar PV System, DFIG Based Wind Energy Conversion System, and SYNDEM Smart Grid Kit.

### **MAJOR AREAS OF RESEARCH AND DEVELOPMENT**

Clean Energy Technology (Fluidized bed technology, thermochemical and biochemical conversion of biomass), Energy Storage (Thermal, Compressed Air, and Li-ion battery), Integration of Renewable Energy Devices, Thermal management of PVT, Energy Management, Solar Photovoltaics, Biosensor, Biofuel cells, Photovoltaics, Thin films, Semiconductor materials and devices, Biomass(microorganism/ waste/ plant materials) to biofuel/ bio-oil/ biodiesel /biogas/ power through

physical/ chemical/ biological means, Clean coal technology, Methane to methanol by Bio-GTL route, Combustion and energy efficiency of systems, Sustainable biofuel, Bio-energy and Green Engineering, Bio-mass gasification, Energy Conservation and Renewable Energy, Solar energy conversion, Microgrid Power Management system, Energy storage and Printed Electronic devices, Wind energy for localized power generation, Biofuel performance in internal combustion engines, Molecular Biology, Protein Engineering, Structural and Functional Proteomics of Carbohydrate active enzymes, other industrially important microbial enzymes and biofuel production from lignocellulosic agriculture wastes, AI/ML based predictive modeling for Energy generation and distribution, Amorphous and nanocrystalline semiconductors, Thin film and Heterojunction solar cells, Perovskite solar cells, Graphene, transition metal dichalcogenides and transition metal oxides, 2D materials, Electrical Energy and Power Engineering, Microgrids' Operation and Control, Model Predictive Control, Modeling and Control of Power Electronics Converters and Inverters, Renewable Energy Grid Integration, Grid-forming Converters with Fuel cell and Hydrogen Storage, Hybrid Energy Storages, Power/Energy Management System, Power to Gas Systems, Machine Learning and Electric Vehicle.

### MAJOR INITIATIVES AND BREAKTHROUGH IN RESEARCH AND DEVELOPMENT

- Development of Ammonia Sensor for Agricultural Sensor

### CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
1	Prof. Arun Goyal	Research and Industrial conclave (RIC 2023)	IIT Guwahati, Assam, India	14/05/2023-16/05/2023	National
2	Prof. Arun Goyal	Research and Industrial conclave (RIC 2023)	IIT Guwahati, Assam, India	14/05/2023-16/05/2023	National
3	Prof. Debasish Das	Advances in Algal Research AAR-2023	IIT Guwahati	14/06/2023	International
4	Dr. Harsh Chaturvedi	IEEE International Conference on Multidisciplinary Research in Technology and Management - MRTM 23	Bangalore	22/09/2023	International
5	Dr. Harsh Chaturvedi	IEEE sponsored 7th International Conference on Computer Applications in Electrical Engineering-Recent Advances (CERA 2023)	IIT Roorkee	29/10/2023	International
6	Prof. Arun Goyal	Biotech Research Society India- International Conference on New Horizons in Biotechnology INDIA (BRSI-NHBT 2023)	Thiruvananthapuram, Kerela, India	26/11/2023-29/11/2023	International
7	Prof. Arun Goyal	4 <sup>th</sup> International Conference on Environmental Science and Applications (ICESA 2023)	Lisbon, Portugal	04/12/2023-06/12/2023	International
8	Prof. Arun Goyal	4 <sup>th</sup> International Conference on Environmental Science and Applications (ICESA 2023)	Lisbon, Portugal	04/12/2023-06/12/2023	International

**INVITED LECTURES OF FACULTY: IN INDIA, ABROAD**

Sl.No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Prof. Debasish Das	Microalgae, a potential platform for biofuels and value-added products: Process engineering perspective	IIT Guwahati	Guwahati	14/06/2023
2	Prof. Ujjwal K. Saha	Harnessing Wind Energy for Local Power Production	Assam Agricultural University Extension Centre	Khanapara, Guwahati, Assam	13/07/2023
3	Dr. E S N Raju P	Application of Artificial Intelligence Techniques in Microgrids	Department of Electrical & Electronics Engineering, JNTU Kakinada	Kakinada, Andhra Pradesh	05/08/ 2023
4	Prof. Ujjwal K. Saha	Indian Space Missions (Teachers' Day Lecture)	NIT Meghalaya	Shillong, Meghalaya	05/09/2023
5	Prof. Ujjwal K. Saha	Liquid Rocket Propulsion	KIIT, Bhubaneswar	Bhubaneswar, Odisha	06/11/2023 – 15/11/2023
6	Prof. Ujjwal K. Saha	Small Wind Turbines: Fundamentals, Recent Trends and Opportunities	Department of Agriculture & Farmers Welfare, GOI	Hyderabad, Telangana	08/11/2023
7	Prof. Ujjwal K. Saha	Spaceflight without Formulae	Nowgong Polytechnic	Nagaon, Assam	22/11/2023
8	Dr. Ranjith Thangavel	Sustainable Materials for High Energy - High power Sodium-ion based Energy Storage Systems	GNU Gyeongsang National University,	South Korea	16/12/2023
9	Prof. V V Goud	Green Energy Technology	Central Institute of Technology Kokrajhar, BTR, Assam	Kokrajhar, BTR, Assam	24/01/2024
10	Prof. Ujjwal K. Saha	Pursuing a Career in Mechanical Engineering	ASTEC and IIT Guwahati	Guwahati, Assam	08/02/2024
11	Prof. Ujjwal K. Saha	Indian Space Missions: From Aryabhata to Chandrayaan 3 (Institute Lecture)	NIT Silchar	Silchar, Assam	27/02/2024
12	Dr. E S N Raju P	Electric Vehicles for Sustainable Development: Technologies, Charging Methods, Configurations, and Standards	TIH IITG TIDF	IIT Guwahati, Assam, India	05/03/ 2024
13	Prof. V V Goud	Food supply chain	I I T Guwahati	Guwahati	06/03/ 2024
14	Dr. E S N Raju P	Control of Microgrids: Key Issues and Challenges	Department of Electrical & Electronics Engineering, NIT Agartala	Agartala, Tripura, India	07/03/2024
15	Dr. Lepakshi Barbora (STO)	Role of Innovative Technologies in Scaling up Biogas	National Seminar on Promotion of Clean Energy Access in	Courtyard by Marriott, Jail Road, Police Bazar,	23/06/2023

Sl.No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
			North-East India organized by Centre for Science and Environment, New Delhi in collaboration with MNRE	Shillong, Meghalaya	

**VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES**

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date
1	Prof Irini Angelidaki	Technical University of Denmark	Interactive session with the faculty and research team of SESE.	13/06/2023
2	Dr. Sanjav Pant	Deputy Director General (Standardization-II) Bureau of Indian Standards Ministry of Consumer Affairs, Food & Public Distribution, Government of India	Prospects for upgradation of standardization methods or inclusion of new methods.	28/06/2023
3	Dr. Rahul Jain	Deputy Program Manager - Centre for Science and Environment, New Delhi	Compressed Biogas (CBG) Landscape in India: Progress, Policies and Opportunities	20/02/2024
4	Dr. Vikas Kumar	Professional, Carollo Engineers Canada, Ltd	Industrial –Academia research collaboration between India and Canada.	21/03/2024
5	Dr. Sangita Kasture	Scientist - 'G' Advisor, Bio Energy Division, Ministry of New and Renewable Energy	For discussion with BDTC Team and for exploring the facilities for bioenergy research at SESE.	21/03/2024

**SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES ORGANISED**

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1	<b>Convener</b> Prof. V. V. Goud Head, SESE, IITG <b>Co-Convenors</b> Dr. Pankaj Kalita, SESE, IITG Dr. Lepakshi Barbora, SESE, IITG Mr. Dhiren Huzuri, SESE, IITG	Energy Efficiency & Entrepreneurship promotion in the areas of Solar, Wind and Hybrid energy systems, IIT Guwahati	MSME	29/01/2024 - 02/02/2024	Regional	35

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
	Mr. Debarshi Baruah, SESE, IITG Mr. Pranjal Bhuyan, SESE, IITG					
2	<b>Convener</b> Prof. V. V. Goud Head, SESE, IITG <b>Co-Convenors</b> Prof. Manab Deka, Head, Dept. of BET, GU Dr. Debabrat Baishya, Dept. of BET, GU Ms. Bharati Baruah, Dept. of BET, GU Dr. Pankaj Kalita, SESE, IITG Dr. Lepakshi Barbora, SESE, IITG Mr. Dhiren Huzuri, SESE, IITG Mr. Debarshi Baruah, SESE, IITG Mr. Pranjal Bhuyan, SESE, IITG	Energy Efficiency & Entrepreneurship promotion in the areas of Bioenergy, Gauhati University	MSME	19/02/2024 - 23/02/2024	Regional	35
3	<b>Convener</b> Prof. V. V. Goud Head, SESE, IITG <b>Co-Convenors</b> Dr. Debarshi Mallick, HoD, Dept of ME, GCU Dr. Pankaj Kalita, SESE, IITG Dr. Lepakshi Barbora, SESE, IITG Mr. Dhiren Huzuri, SESE, IITG Mr. Debarshi Baruah, SESE, IITG Mr. Pranjal Bhuyan, SESE, IITG	Entrepreneurship promotion in the areas waste management, Girijananda University	MSME	20/02/2024 - 24/02/2024	Regional	35
4	<b>Convener</b> Prof. V. V. Goud Head, SESE, IITG <b>Co-Convenors</b> Dr. Farrukh Khalid, SESE, IITG	Entrepreneurship promotion in the areas energy efficient devices, IIT Guwahati	MSME	04/03/2024 - 08/03/2024	Regional	35

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
	Dr. Ranjith Thangavel, SESE, IITG Dr. E S N Raju P, SESE, IITG Dr. Pankaj Kalita, SESE, IITG Dr. Lepakshi Barbora, SESE, IITG Mr. Dhiren Huzuri, SESE, IITG Mr. Debarshi Baruah, SESE, IITG Mr. Pranjal Bhuyan, SESE, IITG					
5	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Vill.: Kokila, Dist.: Bongaigaon, Assam	MNRE	16/10/2023	Regional	42
6	Biogas Development and Training Centre, SESE, IIT Guwahati	Turn Key Workers and Staff Training programme regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel; their construction and maintenance for circular economy. Location: Conference hall, SESE, BDTC, IIT Guwahati	MNRE	30/10/2023	Regional	19
7	Biogas Development and Training Centre, SESE, IIT Guwahati	Staff Training programme for WAMUL, Purabi Dairy regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel; their construction and	MNRE	07/11/2023	Regional	16

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
		maintenance for circular economy. Location: Conference hall, SESE, BDTC, IIT Guwahati				
8	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Conference Hall, Sitajakhala Dairy Farmers Association, Sitajakhala, Jagiroad, Assam	MNRE	17/11/2023	Regional	16
9	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Dairy Farm, Mayong, Morigaon Assam	MNRE	17/11/2023	Regional	10
10	Biogas Development and Training Centre, SESE, IIT Guwahati	Construction cum maintenance training of Biogas Digesters for generation of skilled masons, Turn Key Workers and Staff Training programme regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel; their construction and maintenance for circular economy. Location: Block: Kaliganj, Dist.: Nadia, State: West Bengal	MNRE	21/11/2023 - 26/11/2023	National	25

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
11	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Nahira, Kamrup (R) (Assam)	MNRE	16/12/2023	Regional	16
12	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Rani Andherijuli, Dist.: Kamrup (R) (Assam)	MNRE	21/12/2023	Regional	17
13	Biogas Development and Training Centre, SESE, IIT Guwahati	Turn Key Workers and Staff Training programme regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel; their construction and maintenance for circular economy. Location: Conference Hall, SESE, IIT Guwahati, State: Assam	MNRE	09/01/2024 - 18/01/2024	Regional	11
14	Biogas Development and Training Centre, SESE, IIT Guwahati	Turn Key Workers and Staff Training programme regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel; their construction and maintenance for circular economy. Location: Conference Hall, SESE, IIT Guwahati, State: Assam	MNRE	29/01/2024 - 07/02/2024	Regional	10



Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
15	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Pineapple Processing Centre, Umling, Meghalaya	MNRE	05/02/2024	National	15
16	Biogas Development and Training Centre, SESE, IIT Guwahati	Construction cum maintenance training of Biogas Digesters for generation of skilled masons. Vill.: Amlighat, Jagiroad (Assam)	MNRE	05/02/2024 – 10/02/2024	Regional	10
17	Biogas Development and Training Centre, SESE, IIT Guwahati	Training of users and awareness regarding the management of wet solid waste through the installation of biogas digesters for organic manure, lighting, and cooking fuel. Location: Borajal, Ghoghrapar, Dist.: Nalbari	MNRE	10/02/2024	Regional	25
18	Biogas Development and Training Centre, SESE, IIT Guwahati	Construction cum maintenance training of Biogas Digesters for generation of skilled masons. Vill.: Ghagrpar, Nalbari (Assam)	MNRE	10/02/2024 – 15/02/2024	Regional	10

#### AWARDS AND HONOURS

- Prof. V. V. Goud: Fellow of Indian Institute of Chemical Engineers (IChE).

#### STUDENTS' ACHIEVEMENTS

- Maibam P. Devi: Best paper award certificate; 4<sup>th</sup> International Conference on Environmental Science and Applications (ICESA 2023).
- Umang H. Rathod: ASME Students Advisory Committee Travel Award (SACTA); American Society of Mechanical Engineers.
- Ms. Vijaya: Best oral presentation award; 2<sup>nd</sup> International conference on novel materials and technologies for energy and environment applications organized by Department of Chemical engineering, BITS Pilani Hyderabad campus, Telangana.
- Mr Yashkumar Jitendrabhai Parekh, Mr Amulya Saxena, and Mr. Rishi Purohit: 2<sup>nd</sup> runner up prize in L&T TECHgium competition, 6th edition; L&T Technology Services Mysore.

## FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
<b>CORE FACULTY MEMBERS</b>				
1.	E S N Raju P	Indian Institute of Technology Indore	Assistant Professor	Smart grid; Microgrid; Grid integration of renewable energy sources (solar power, wind power, etc) energy storage, and flexible loads; Different topologies and control algorithms of power electronic converters; Power electronics applications to power systems; Application of optimization/artificial intelligence techniques to power systems/micro-grids; PMUs/ $\mu$ PMUs applications to power systems/micro-grids ; EV Charging infrastructure
2.	Farrukh Khalid	Ontario Tech University, Oshawa, Ontario, Canada	Assistant Professor	Applied Thermodynamics, Hydrogen Production using Thermochemical cycles and Renewable, Exergy Analysis, Sustainable Energy Systems, Waste Management, High Temperature Electrolysis, Nuclear Desalination, Green Buildings, Multi-generation Systems, Solar Desalination
3.	Kuldeep Kumar	Indian Institute of Technology Delhi	Assistant Professor	Electrical Energy and Power Engineering, Microgrids' Operation and Control, Model Predictive Control, Modeling and Control of Power Electronics Converters and Inverters, Renewable Energy Grid Integration, Grid-forming Converters with Fuel cell and Hydrogen Storage, Hybrid Energy Storages, Power/Energy Management System, Power to Gas Systems, Solar Photovoltaic, Machine Learning and Electric Vehicle.
4.	Pankaj Kalita	Indian Institute of Technology Guwahati	Associate Professor	Clean Energy Technologies, Solar Thermal, Energy Storage
5.	Ranjith Thangavel	Chonnam National University, South Korea	Assistant Professor	Energy Storage and Conversion, Lithium/Sodium-ion Batteries, Supercapacitors, Electrocatalysis, Electric Vehicles, Battery

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
				Management System, Solar Cells, Fuel-cells, Hydrogen Production and Storage
<b>ADJUNCT FACULTY MEMBERS</b>				
6.	Arun Goyal	Indian Institute of Technology Kanpur	Professor, Department of Biosciences and Bioengineering	Molecular Biology, Protein Engineering, Bioethanol
7.	Kaustubha Mohanty	Indian Institute of Technology Kharagpur	Head, School of Energy Science and Engineering & Professor, Department of Chemical Engineering	Biofuels (bio-diesel, bio-ethanol and bio-Hydrogen), Utilisation of Lignocellulosic Biomass for Fuel Production.
8.	Mahuya De	-	Professor, Department of Chemical Engineering	Catalysis and reaction engineering, adsorption, hydrocarbon processing
9.	P. Muthukumar	Indian Institute of Technology Madras	Professor, Department of Mechanical Engineering	Hydrogen Energy (Storage and Applications), Metal hydride based thermal machines, Porous medium combustion, Heat and mass transfer in porous medium, Sorption heating and cooling systems, Waste heat recovery, Thermal energy storage systems, etc.
10.	S. Senthilmurugan	Indian Institute of Technology Delhi	Professor, Department of Chemical Engineering	Modeling and Optimization of Novel Processes, Process Design and Operation of Membrane Separation Processes, Waste and waste water treatment (WWWT) for Process Industries, Novel Desalination Technologies, Smart Water Grid, Waste to Energy
11.	Vijay S Moholkar	University of Twente, Netherlands	Professor, Department of Chemical Engineering	Thermochemical and biochemical conversion of biomass for synthesis of green gaseous and liquid fuels, 3G biofuels, conversion of waste to value added products, synthesis of functional polymer and bionanocomposites
12.	V. V. Goud	Indian Institute of Technology Kharagpur	Professor, Department of Chemical Engineering	Bio-energy; Biolubricant, Heterogeneous Reactions, Utilisation of Lignocellulosic Biomass for Production of Fuel/Chemicals, Application of Supercritical Fluids, Wastewater Treatment

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
<b>ASSOCIATED FACULTY MEMBERS</b>				
13.	D. Das	Indian Institute of Technology Bombay	Professor, Department of Biosciences and Bioengineering	Metabolic engineering, Biochemical engineering, Modelling of fermentation process, Biofuel
14.	H.B. Nemade	Indian Institute of Technology Bombay	Professor, Department of Electronics and Electrical Engineering	Electronic instrumentation, Systems design, Ultrasonic instrumentation, Non-destructive testing, Electronic product design, EMI/EMC issues, Acoustic sensors, Underwater acoustics, Surface acoustic wave devices, MEMS
15.	K. Kalita	University of Nottingham, U.K	Professor, Department of Mechanical Engineering	Rotordynamics, Coupled Dynamics of Electro-Mechanical Systems, Vibration
16.	L. Sahoo	MDU, Rohtak	Professor, Department of Biotechnology	Genetic engineering and functional genomics of plants
17.	N. Sahoo	Indian Institute of Science, Bangalore	Professor, Department of Mechanical Engineering	Fluid and Thermal Engineering, Aerodynamics, Gas Dynamics, Instrumentation, Measurements and Experiments in Fluid
18.	P. Agarwal	Indian Institute of Technology Kanpur	Professor, Department of Physics	Amorphous and nano-crystalline semiconductor thin films solar cells, perovskite solar cells, heterojunction solar cells and other devices
19.	P. Goswami	Gauhati University	Professor (HAG), Department of Biosciences and Bioengineering	Biosensors and Biofuel cells
20.	S. K. Nayak	Indian Institute of Science, Bangalore	Associate Professor, Department of Electronics and Electrical Engineering	Power flow analysis in AC and DC traction power system, Electromagnetics, Lightning interaction with an electrical and mechanical system, High Voltage Engineering
21.	U. K. Saha	Indian Institute of Technology Bombay	Professor, Department of Mechanical Engineering	Turbomachinery, Jet Propulsion, Internal Combustion Engines and Wind Energy
22.	V. Kulkarni	-	Professor, Department of Mechanical Engineering	High enthalpy flows, scramjet engine, experimental, aerodynamics, measurement science, CFD simulations
<b>HONORARY FACULTY MEMBERS (INDIA)</b>				

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
23.	Prof. S.C. Sharma	Mysore University	Director, NAAC, Bangalore	Photoluminescence of Nanophosphors, Photoluminescence, Thermoluminescence, Photocatalytic Studies of Radioactive Nanomaterials, Sensors for Phenolic Compounds, Hydroquinone, Melamine, Dopamine, Paracetamol, Folic Acid etc., Display, Dosimetry and Advanced Forensic Applications of Nanomaterials
<b>HONORARY FACULTY MEMBERS (FOREIGN)</b>				
24.	Prof Irimi Angelidaki	Technical University of Denmark	Professor	Biofuels (biogas, biohydrogen, bioethanol) production, Microbial Electrochemistry, Algae as Bioresource and Biorefineries, Optimization of the Anaerobic Processes and Development of Sustainable Solutions for Organic Waste and Wastewater Treatment
25.	Prof Soteris Kalogirou	Cyprus University of Technology	Professor	Solar Thermal Collectors, Hybrid Photovoltaic/Thermal Systems, Artificial Intelligence Techniques for the Performance Prediction of Energy and Renewable Energy Systems

**Jyoti and Bhupat Mehta School of Health  
Science and Technology**

**YEAR OF ESTABLISHMENT OF THE SCHOOL: 2021**

**ACADEMIC PROGRAMMES OFFERED: M.Tech. and PhD**

### **LABORATORY FACILITIES**

- Biotechniques & Bioinstrumentation Laboratory
- Diagnostics & Devices Laboratory
- Product Design & Prototyping Laboratory

### **MAJOR EQUIPMENT AND FACILITIES ACQUIRED**

#### **Equipment**

- Biometric Device, Make: Securege, Model : S-FB3K
- Mini-PROTEAN Tetra Cell, Mini Trans-Blot Module and PowerPac Basic Power Supply, Cat No. 1658033, Make: Biorad
- 4662030 FINNPIPETTE F2 8-CHANNEL 30-300ML
- 4662000 F2 MC8 Variable Volume 1-10 UL
- Vacuum Pumps, Make: MASTERCOOL, Model :90060220
- Liquid Nitrogen Container, IN-30, INOXCVA
- CO2 Cylinder
- Vacuum Pump V300 AXIVA
- Whirlpool Solo Microwave Oven-20Litre
- Hot Air Oven Universal 14x14x18 1K-109, IKON
- U.V.Cabinet, IK -202
- Heating Mantle 500ml IK-161, IKON
- Heating Mantle IK-161,10ml IKON
- 1640300 MINI SUB GT/W/PP/Basic
- Probe Sonicator, Model-PKS-500F, Make: PCI Analytics
- 4700880 Micro-pipette set with stand cap:0.2-2,2-20,20-200 & 100-1000 microlitre, Thermo Fisher Scientific
- Wensar High Precision Balance. Make: Wensar, Model: HPB201

#### **Facilities**

##### 13.Furnitures

- Staff table with drawer
- Computer Table
- Staff Chairs
- Lab Table with Drawer
- Low Back Chair

##### 14. Modular Lab Setup

## MAJOR AREAS OF RESEARCH AND DEVELOPMENT

The School is pursuing research in the multi-disciplinary area related to Health Science required to meet the future challenges and to augment academic partnerships with industry.

The major projects sanctioned at the centre during this financial year 2023-2024 are: Healthcare, Medical Devices, Diagnostics, Bioinformatics, Biomaterials & Tissue Engineering, Cancer Biology, Nanotheranostics, Fungi in Disease and Health, Cancer Immunotherapy, Stem Cell Biology, and Neurobiology.

## CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED: NATIONAL/ INTERNATIONAL

Sl. No.	Name of Faculty	Name of Conf./Workshop	Place	Date	International/ National
1	Dr. Rajiv K. Kar	Five-Day Online Faculty Development Program on "Development of therapeutics using Bioinformatics: Recent trends and strategies"	NIT Warangal	8-12 <sup>th</sup> May 2023	National
2	Dr. Rajiv K. Kar	Quantum Information and Quantum Theory Conference	IISER Kolkata (Online)	7 <sup>th</sup> June 2023	International
3	Prof. Chandan Mukherjee	16 <sup>th</sup> International Symposium on Applied Bioinorganic Chemistry	Karolos Papoulias Conference Center, University of Ioannina, Ioannina, 45110, Greece	11-06-2023 to 14-06-2023	International
4	Dr. Rajiv K. Kar	Energy Summit Conference "Functionalization and Surface Properties"	University of Petroleum and Energy Studies, Dehradun	20-22 <sup>nd</sup> September 2023	International
5	Dr. Rajiv K. Kar	Workshop: "Impact of artificial intelligence in nursing education"	Arya Nursing College, Guwahati	29 <sup>th</sup> September 2023	National
6	Dr. Rajiv K. Kar	5 Days Faculty Development Program on "Bioinformatics and Computational Biology Approaches in Present Day Research"	University of Engineering and Management, Kolkata	7 <sup>th</sup> November 2023	National
7	Dr. Rajiv K. Kar	8th International Conference on Advanced Nanomaterials and Nanotechnology - ICANN 2023 on "Tuning Properties of Carbonaceous Materials by Functionalization with Biocompatible Groups"	Indian Institute of Technology Guwahati	1 <sup>st</sup> December 2023	International
8	Dr. Rajiv K. Kar	Advanced Functional Materials and Informatics (AFMI-2023)	Indian Institute of Technology Varanasi (BHU)	2 <sup>nd</sup> December 2023	National



9	Dr. Rajiv K. Kar	Online Familiarization Workshop: “Using Computational Modelling for Assigning Experimental Spectra of Materials”	Indian Institute of Technology Guwahati	7 <sup>th</sup> December 2023	National
10	Prof. Biman B. Mandal	International Conference on BIOMEDICAL MATERIALS AND TECHNOLOGY (BioTE <sub>x</sub> ) 2023 “Bioengineered human tissues and organs: The way forward in healthcare”	Indian Institute of Technology Delhi	29 <sup>th</sup> Nov- 1 <sup>st</sup> Dec. 2023	International
11	Dr. Krishna P. Bhabak	International conference on Modern Trends in Inorganic Chemistry (MTIC-2023)	IISc, Bangalore	14-17 <sup>th</sup> December 2023	International
12	Dr. Krishna P. Bhabak	Symposium on Advanced Biological Inorganic Chemistry (SABIC-2024)	IACS, Kolkata	7-11 <sup>th</sup> January 2024	International
13	Prof. Chandan Mukherjee	Symposium on Advanced Biological Inorganic Chemistry (SABIC-2024)	IACS, Kolkata	7-11 <sup>th</sup> January 2024	International
14	Dr. Krishna P. Bhabak	Emerging Trends in Catalysis and Synthesis (ETCS-2024)	IIT Kharagpur	7-9 <sup>th</sup> March 2024	International

#### INVITED LECTURES OF FACULTY: IN INDIA, ABROAD

Sl. No.	Name of Faculty	Name of Lecture	Name of Inst./Org.	Place	Date
1	Dipankar Bandyopadhyay	Evidence Based ‘Precision’ Healthcare.	IIT Kanpur	IIT Kanpur	March 2023
2	Roy Paily Palathinkal	Selective adhesion on FET for Biosensing Applications	Professor R M Sethunarayanan Endowment Lecture,	Annamalai University	13 April 2023
3	Dipankar Bandyopadhyay	Laws and Limits	Research Conclave IIT Guwahati	IIT Guwahati	May 2023.
4	Dipankar Bandyopadhyay	Multiphase Systems under Electric Field: from ‘Kissing’ to ‘Threading’.	University of Bordeaux	University of Bordeaux	June 2023
5	Roy Paily Palathinkal	Sensitive Detection of Biological Matter using FET	10th International Conference on Microelectronics Circuits and Systems, Micro2023	Guwahati	1 July 2023
6	Dr. Rajiv K. Kar	Meet the Bioinformatician (MTB) Series	Regional Student Group-India Student Council,	University of Delhi, South Campus	5 <sup>th</sup> August 2023

			International Society of Computational Biology		
7	Dr. Rajiv K. Kar	Young Scientist Lecture	Odisha Bigyan Academy, DST-Odisha	Bhubaneswar, Odisha	13 <sup>th</sup> September 2023
8	Prof. Biman B. Mandal	International Conference on BIOMEDICAL MATERIALS AND TECHNOLOGY (BioTE <sub>x</sub> ) 2023 “Bioengineered human tissues and organs: The way forward in healthcare”	Indian Institute of Technology Delhi	New Delhi	30 <sup>th</sup> November 2023
9	Dr. Subarta Pramanik	8th International Conference on Advanced Nanomaterials and Nanotechnology - ICANN 2023 on “Understanding Brain-Sex Differentiation in Health and Disease – Implications in Sex/Gender-Specific Medicine in Healthcare”	Indian Institute of Technology Guwahati	Guwahati	1 <sup>st</sup> December 2023
10	Roy Paily Palathinkal	Magnetic and Semiconductor Devices for the Analysis of Breath Gas Components	The XXII International Workshop on the Physics of Semiconductor Devices (IWPSD 2023)	IIT Madras	16 December 2023
11	Dr. Krishna P. Bhabak	Bioanalyte-triggered Turn-On Fluorogenic Processes for the Simultaneous Delivery of Hydrogen Sulfide and Drugs	IISc, Bangalore	Bangalore	17 <sup>th</sup> December 2023
12	Dr. Krishna P. Bhabak	Stimuli-Responsive Turn-On Fluorogenic Processes toward the Delivery of Hydrogen Sulfide and Drugs	IACS, Kolkata	Kolkata	7 <sup>th</sup> January 2024
13	Roy Paily Palathinkal	Sensors for the Detection of Breath Components	International Conference on Devices, Sensors and Systems (CoDSS), ECE Department	Tezpur University	11 February 2024
14	Roy Paily Palathinkal	Devices for the Detection of Breath Components	INUP-i2i Online Familiarization Workshop on Nano Sensors and Optoelectronic Devices	IIT Guwahati	14 February 2024
15	Dr. Krishna P. Bhabak	Stimuli-responsive Fluorogenic Prodrug for the Simultaneous Delivery of Diclofenac and Hydrogen Sulfide	IIT Kharagpur	Kharagpur	8 <sup>th</sup> March 2024

16	Roy Paily Palathinkal	Opportunities in the Semiconductor Sector	Online Seminar at, Indias Techade: Chips for Viksit Bharat	NIT Agartala (online)	13th March 2024
17	Roy Paily Palathinkal	Developments in Semiconductor Technology and Applications	Semiconductor at IIT Guwahati, Indias Techade: Chips for Viksit Bharat	IIT Guwahati	13th March 2024
16	Roy Paily Palathinkal	Semiconductor Industry of the Future	Viksit Bharat Western zone workshop - Thriving and Sustainable Economy, Datta Meghe Institute of Higher Education & Research	Nagpur (online)	30th March 2024

#### VISITORS FROM OTHER INSTITUTES/UNIVERSITIES/ORGANISATIONS/INVITED LECTURES

Sl. No.	Name	Name of Inst./Univ./Org.	Purpose/ Name of Lecture	Date
1	Dr. Nitu Bhaskar	Post Doctoral fellow University of Connecticut, USA	Invited Talk on "A Polymer Composite with Enhanced Piezoelectricity: A Promising Approach for Tissue Engineering in Regenerative Medicine"	5 <sup>th</sup> April 2024
2	Dr. Hardik Jeetendra Pandya	Associate Professor, Indian Institute of Science, Bangalore	Invited Talk on "Invasive and Non Invasive Technologies for Neural Engineering"	5 <sup>th</sup> April 2024

#### SEMINARS/WORKSHOPS/CONFERENCES/SHORT-TERM COURSES

Sl. No.	Name of Faculty (Convener/ Co-ordinator, etc.)	Name of Sem./Wor./Con.	Funded By	Date	International/ National	No. of participants
1	Dr. Rajiv K. Kar	One-day Hands-On Training Workshop on Analytical and Microbial Techniques	DST-SERB	20 <sup>th</sup> March 2024	National	25

#### AWARDS AND HONOURS

- Dr. Subrata Pramanik: Life Fellow of Indian Chemical Society (FICS); Indian Chemical Society, Kolkata, INDIA.

## STUDENTS' ACHIEVEMENTS

- Mr. Shubham Sanjay Agrawal: Khorana Scholar at UCSD, Reliance foundation postgraduate scholarship; IUSSTF, DBT, WINStep Reliance foundation.
- Ms. Suchismita Dhar: Best Oral Presentation, Health Sciences; Research & Industrial Conclave 2023, IITG.
- Mr. Amit Kumar Sah: UNESCO TWAS-DBT Fellowship; UNESCO The World Academy of Science – DBT.
- Ms. Sheetal Das: ACS sponsored best Oral presentation; ICANN 2023, Center for Nanotechnology, IITG.

## CORE FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Rajiv K. Kar	Bose Institute, University of Calcutta	Assistant Professor	Sensors and Diagnostics, Analytical Chemistry, Quantum Mechanics, Soft Matter Low-dimensional Materials, Simulation, Spectroscopy, Photobiology, Data Science
02	Subrata Pramanik	RWTH Aachen University, Germany	Assistant Professor	Molecular Neurobiology and Embryology, Pharmacology and Toxicology, Computational Biology and Bioinformatics, Cancer Neuroscience, Protein Engineering and Biocatalysis

## ASSOCIATED FACULTY MEMBERS

Sl. No.	Name	Name of the University/Institute/Org PhD degree received from	Designation	Areas of Interest
01	Dipankar Bandyopadhyay	IIT Kanpur	HoC and Professor	Micro/nano Mechanics of Soft Matter, Rheology of Viscoelastic Materials, Liquid Crystals, and Smart Materials, Intermolecular forces, Colloids and Interfacial science, Micro/Nano Fluidics, Electro- and Magneto-hydrodynamics, Electrokinetics, Self-Organized Solar Cells and Light Emitting Devices,

				Advanced Flow Microreactors for Artificial Photosynthesis, Hydrogen Production, Bio-Synthesis, and CO <sub>2</sub> sequestration, Synthesis and Applications of micro/nano Robots, MEMS Theranostic devices, Point-of-Care-Testing Health Care Devices
02	Parameswar K. Iyer	CSMCRI, Bhavnagar	Professor	Organic and Polymer synthesis, Bio & Chemosensors, Optoelectronic devices.
03	Roy P. Paily	IIT Madras	Professor	VLSI & MEMS.
04	Biman B Mandal	IIT Kharagpur	Professor	Regenerative Medicine, Biomaterials, Tissue Engineering, Stem Cells
05	G. Krishnamoorthy	IIT Kanpur	Professor	Organic Photochemistry & Spectroscopy.
06	Bithiah G. Jaganathan	Institute for Transfusion Medicine and Immune Hematology, Germany	Professor	Stem Cell Biology, Cancer signaling
07	Ranjan Tamuli	Centre for Cellular and Molecular Biology, Hyderabad.	Professor	Calcium signaling, Genetics, DNA repair
08	Tapas K. Mandal	IIT Kharagpur	Professor	Micro-nano technology and its application in Energy harvesting, Healthcare, Process intensification, Point of care techniques in diagnosis of diseases, Artificial Photosynthesis and Microfluidics.
09	Harshal B. Nemade	IIT Bombay	Professor	Electronic and Ultrasonic instrumentation, Electronic product design, EMI/EMC issues, Acoustic sensors, Surface acoustic wave devices, MEMS, NEMS.
10	S. Kanagaraj	IIT Kharagpur	Professor	Biomaterials Carbon nanotubes based nanocomposites Nanofluids Materials characterization
11	Chandan Mukherjee	Max-Planck-Institut für Bioanorganische Chemie, Germany	Professor	Oxidation Catalysis / Molecular Magnetism / Synthesis of Single-Molecule Magnets (SMMs) / MRI Contrast agents / Water Oxidation Chemistry.

12	S. K. Dwivedy	IIT Kharagpur	Professor	Design and Robotics Non-linear Dynamics Vibration
13	Siddhartha S. Ghosh	IICB, Kolkata	Professor	Gene Therapy & Nanobiotechnology.
14	Bhisma K. Patel	IIT Kanpur	Professor	Bio-Organic Chemistry and Newer Methodologies.
15	Subhendu S. Bag	IIT Kharagpur	Professor	Bio-Organic/Medicinal Chemistry of Nucleic Acids, Peptides, and b-Lactam Antibiotics.
16	Uttam Manna	IISc, Bangalore	Associate Professor	Bio-inspired Polymer Materials, Drug Delivery, Open Microfluidics, Chemical Sensor
17	Raghvendra Gupta	University of Sydney	Associate Professor	Multiphase flow, Microfluidics and micro process engineering, Computational and experimental fluid dynamics.
18	Partho S. G. Pattader	Lehigh University, USA	Associate Professor	Stochastic dynamics, Colloid and Interface science, Tribology, Soft matter.
19	Akshai Kumar A S	IISc Bangalore	Assistant Professor	Organofluorine Chemistry, Catalysis (Homogeneous and Heterogeneous), C-H and C-F activation.
20	Krishna P. Bhabak	IISc Bangalore	Associate Professor	Design and synthesis of organic compounds or fluorescently labeled compounds or the turn-on fluorogenic drug delivery systems/prodrugs for the treatment strategies of various disease states such as cancer or inflammatory diseases
21	Urmi Salve	University of Calcutta	Associate Professor	Human Factor Engineering, Occupational Ergonomics, Cognitive Ergonomics, Research Methodology
22	Daksha Parmar		Assistant Professor	Public Health and Development, Social Science Issues in Health, Human Resources for Health in India, Interface of Frontline Healthcare Providers with Health Systems, Health Policy and Research, Global Public Health, Population and Development, History of Birth Control, Gender and Health
23	Narayanasamy Selvaraju	IIT Madras	Assistant Professor	Environmental Biotechnology, Bioprocess Engineering, Biochemical Engineering

24	Palash Ghosh	ISI Kolkata	Assistant Professor	Q-learning (Reinforcement Learning) and Dynamic Treatment Regime (DTR), Personalized Medicine, Biased Sampled Data, Multi-Sample Likelihood, Case-Control Study, Design and Analysis of Clinical Trials, Analysis of Electronic Medical Records Data and other areas of Statistics
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**PART III**

**RESEARCH PUBLICATIONS**

Research Publications

Books

Book Chapters

**DETAILS OF RESEARCH AND DEVELOPMENT**



<https://www.scopus.com/results/results.uri?sort=plf-f&src=s&nlo=&nlr=&nls=&sid=b3f692633698b8a0c6a204959d613f1f&sot=aff&sdt=cl&cluster=scopubyr%2c%222023%22%2ct&sl=34&s=AF-ID%2860010126%29+OR+AF-ID%2860171711%29&origin=resultslist&zone=leftSideBar&editSaveSearch=&txGid=f16e1c48748085033738f948608dac0b>

## DETAILS OF RESEARCH AND DEVELOPMENT

### New Sponsored Projects: 127

Project Title	PI Name	Funding Agency	Dept	Sanctioned Amount
Localized Therapeutic Delivery Systems Based on Water Insoluble Thixotropic Hydrogels of Small Peptides for Breast Cancer Treatment	Debapratim Das	SERB	Chemistry	5236000
AI/ML for Beamforming in 6G	Nandana Rajatheva	Opetushallitus Utbildningsstyrelsen	Electronics and Electrical Engineering	1008000
Development of electronic composite materials for vibration energy harvesting, information transmission and virus detection	Lalit Mohan Pandey	DST	Biosciences and Bioengineering	652000
Distilling Science, Engineering and Technological Knowledge from ancient literature of Mahapuranas	Lalit Mohan Pandey	AICTE	Centre for Indian Knowledge Systems	375000
Securing low-power embedded processors for IoT applications against power-analysis attacks	Roy Paily Palathinkal	Semiconductor Research Corporation	Electronics and Electrical Engineering	3476569
Design, prototype, testing and control of 30kW high power density motors for EV application.	Praveen Kumar	DEITY	Mechanical Engineering	4326000
Design, prototype, testing and control of 30kW high power density motors for EV application.	Praveen Kumar	MEITY	Electronics and Electrical Engineering	4327000
Women, local governance and livelihood strategies in conflict zones: An Assessment of Karbi Anglong District of Assam	Pahi Saikia	ICSSR	Humanities and Social Sciences	490720
Gene expression analysis of the citral	Sachin Kumar	BORDOLOI BIOTECH INDIA PRIVATE LIMITED	Biosciences and Bioengineering	200000
Study of Truth Graphs: Applications in Logic gate and Cryptography	Dr. Gete Umbrey	SERB	Mathematics	1830000
Development of sustainable lightweight 3D Printable cementitious composites for modular construction	Indu Siva Ranjani G	Tata Steel	Civil Engineering	65938.4

In-silico, In-vitro and In-vivo evaluation of metabolites of curcumin as potential anti-inflammatory agents	Shankar Prasad Kanaujia	SERB	Biosciences and Bioengineering	1005000
Impact and Suitability of Electric Vehicles to Indian Roads	Dr Anuj Budhkar	DST	Civil Engineering	1796125
Interface Engineered Sulfur Cathodes and Lithium Metal Anodes with Heterostructured Host for Safer Lithium-sulfur batteries	Ranjith Thangavel	TATA STEEL, Jamshedpur	School of Energy Science and Engineering	154216.63
A Real time 2D flood inundation forecasting system for the Brahmaputra River basin using Hydrologic- Hydro dynamic and statistical dynamical approaches	Rajib Kumar Bhattacharjya	IITM	Civil Engineering	2700448
Design and Development of AI/ML Co-Processor and Post Quantum Cryptography Co-Processor (An initiative towards Electronics System Design and Manufacturing in North-East Region)	Gaurav Trivedi	DEITY	Electronics and Electrical Engineering	199990000
Survey and Studies on Remediation of Microplastics on shorelines of Brahmaputra River	Vimal Katiyar	NEDFI	Centre for Sustainable Polymers	7740000
Development of coupled finite volume method-direction simulation Monte Carlo (FVM-DSMC) code for continuum-rarefied mix flow	Tapan Krishnakumar Mankodi	DRDL	Mechanical Engineering	2669040
Formulation of membrane based Micro Reactor for decontamination cum denitration of nitrate bearing effluents and conversion to valuable products	Chandan Das	SERB	Chemical Engineering	3923260
Antecedents of green consumption in emerging economies: A mixed method approach	Kuldeep Baishya	IIT Guwahati	School of Business	500000
Design and development of real-time semantic segmentation networks and the corresponding FPGA-ASIC based hardware accelerators for possible deployment in commercial prototype for autonomous driving	S.R. Ahmed	SERB	Electronics and Electrical Engineering	2875302
Design and development of real-time semantic segmentation networks and the corresponding FPGA-ASIC	S.R. Ahmed	SERB	Electronics and Electrical Engineering	2875302

based hardware accelerators for possible deployment in commercial prototype for autonomous driving				
Sign Language Translator for Identification of Health Conditions of the Deaf and Dumb Population for Medical Attention.	Dr Manas Kamal Bhuyan	SERB	Electronics and Electrical Engineering	1754016
Sustainable Biorefinery and Bioplastic production from bamboo waste	Vimal Katiyar	India	Chemical Engineering	4654680
Biodegradable Toys Centre for Sustainable Livelihood Empowerment of ST community "(GREEN Putola Centre)" Green toys from Assam.	Prof Vimal Katiyar and Dr. Amit Kumar	DST	Centre for Sustainable polymers	23284710
Metabolic engineering of Rhodococcus opacus: A potential workhorse for lignin valorization into high-value lipids	S Senthilkumar	DST	Biosciences and Bioengineering	5896264
Identifying bacterial wilt resistant/tolerant tomato plant(s) by selective propagation of young tomato seedlings resistant/tolerant to prior Ralstonia solanacearum infection	Dr. Anjan Barman	SERB	Biosciences and Bioengineering	1005000
Women, local governance and livelihood strategies in conflict zones: An Assessment of Karbi Anglong District of Assam	Dr Pahi Saikia	ICSSR	Humanities and Social Sciences	490720
Integrated Track in Brain and Cognitive Sciences/ IBRAIN	Bidisha Som	EUROPEAN EDUCATION AND CULTURE EXECUTIVE AGENCY	Humanities and Social Sciences	4545679.32
The Development of Multidisciplinary Education in Circular Economy	Sudip Mitra	Finland	Centre for Disaster Management	231375
N/A	Satyajit Pramanik	NBHM	Mathematics	235000
Studies of Color Migration of Different Colored Polymers in Food Stimulant	Vimal katiyar	TVPL	Centre for Sustainable Polymers	300000
Patient-Specific Hemodynamics in Coronary Circulation	Raghvendra Gupta	ICMR	Chemical Engineering	3693173

Three-Dimensional Large Deformation Isogeometric Impact and Self-contact Using Varying-Order NURBS Discretization Approach	Sachin Singh Gautam	SERB	Mechanical Engineering	2975764
Use of InfraGreen (PPC)- High Performance Blended Cement for Manufacturing Railway Pre-Stressed (PS) Mono Block Concrete Sleeper	Dr. Arun Chandra Borsaikia	Other Industrial Funding Agency	Civil Engineering	873840
Metal Free Aminative C-O Cleavage of $\alpha$ -Oxycarbonyls: Expeditious Access to Aminoalcohols-Based Antidepressants	C.K. Jana	SERB	Chemistry	3850000
Performance Assessment of Cell Filled Concrete Pavements	Anjan Kumar Siddagangaiah	NRRDA	Civil Engineering	3806000
Development and leveraging small-scale fluidic Platform towards understanding the plant root system: A Convergence of Engineering and Biology	Pranab Kumar Mondal	DST	Mechanical Engineering	6887657
Cooperative Control of Networked Multi-agent Systems utilizing Negative Imaginary Theory with an Application to Multi-robot Systems	P Bhoumick	SERB	Electronics and Electrical Engineering	940500
Memorandum of Understanding between the Mehta Family Foundation and IIT Guwahati for the establishment of the Mehta Family School of Data Science and Artificial Intelligence and the Jyoti and Bhupat Mehta School of Health Sciences and Technology	Dipankar Bandyopadhyay	Mehta Family Foundation	School of Health Science and Technology	8200000
Hydrological experiment and river discharge modeling for SWOT and Sentinel-3A/B missions: Brahmaputra River	Subashisa Dutta	ISRO	Civil Engineering	1128000
Strategies to enhance the Impact of Suvidha scheme under Pradhan Mantri JanAushadhi Program (PMPJP)	Priyank Sinha	ICSSR	School of Business	1343750
Synthesis and Characterization of Vanadium Oxoperoxo Complexes: Mimicking Vanadium Haloperoxidases	Prof. Biplab Mondal	SERB	Chemistry	1830000
International Travel Support to Attend Dalton 2023	CV Sastri	SERB	Chemistry	157291

Unravelling the Functional Mechanism of Target Recognition and Cleavage in an Unusual CRISPR-Cas System	B Anand	SERB	Biosciences and Bioengineering	5908760
Investigation of the Reentrant Disordered Behavior and Catalytic Properties of Frustrated Pyrochlore Nanostructures	S Thota	DST	Physics	6171000
Investigating the dynamics of benign termination of relativistic runaway electron beams in tokamak experiments	Vinodh Kumar Bandaru	IIT Guwahati	Mechanical Engineering	500000
Construction and Application of Ancient Indian Astronomical Yantras: Documentation and Training	Bharat Tadikonda	Ministry of Education	Centre for Indian Knowledge Systems	1250000
Geopolymerization of fine fraction obtained from biomining of legacy waste from old MSW dumpsite	A K Mishra	DST	Civil Engineering	2038167
Gasification of Agro Residues and Municipal Solid Wastes for decentralized power generation	Pankaj Kalita	DRDO	School of Energy Science and Engineering	276000
Astronomical Orientations of Ancient Temples	Tadikonda Venkata Bharat	AICTE	Centre for Indian Knowledge Systems	1650000
Algorithm-based prevention and reduction of cancer health disparity for data-disadvantaged population	Teena Sharma	IIT Guwahati	Mehta School of Data Science and Artificial Intelligence	500000
Green Reinforcements: Developing Sustainable Biocomposites for Interior Applications	Ujendra Kumar Komal	IIT Guwahati	Mechanical Engineering	500000
Development of a novel local rehabilitation technique for corroded steel-reinforced concrete structures	Oinam R. Meetei	OTHER	Civil Engineering	1100000
Incorporation of advanced technology as Retrofitting for the removal of Fluoride from the PWSS at (a) Nizbbogai (b) Rajapara 2 and (c) Sakhati, in Boko town of Kamrup District, Assam.	Mihir Kumar Purkait	Jal Jeevan Mission (NJJM)	Chemical Engineering	16005000
Prime Minister Awaas Yojana (PMAY) in Assam: A Study of Its Reach and Impact	B Sengupta	ICSSR	Humanities and Social Sciences	1500000
Additive manufacturing of architected metamaterial with hybrid fused filament fabrication for functional product design	Ajeet Kumar	IIT Guwahati	Design	500000

Sustainable Earthquake Resistant 3D-Printed Concrete Housing From Laboratory Testing to Industrial Application	Biranchi Narayan Panda	DST	Mechanical Engineering	2441996
Investigation of Solid Flow in an Elevated Temperature Fluidized Bed with Decomposing and Non-Decomposing Liquid Injection through Side Wall Pneumatic Nozzles	Dr Pankaj Tiwari	BRNS	Chemical Engineering	3227100
Design and Development of a Premix for Manufacturing of Lightweight Bricks	Dr. Arun Chandra Borsaikia	ZERU	Civil Engineering	1200480
The Maximal Dispersion in Metric Space	Gautam Kumar Das	SERB	Mathematics	660000
AI/ML- based Channel Estimation and Beamforming for mmWave MIMO-OTFS in 6G	Kuntal Deka	DST	Electronics and Electrical Engineering	3780966
A Rapid Assessment of the Orunodoi Scheme	R Bedamatta	UNICEF Assam	Humanities and Social Sciences	1005000
Bilingual experience? in heritage language speakers and its impact on cognitive control: Creating data base from varying socio-cultural background	Bidisha Som	DST	Humanities and Social Sciences	4810751
J C Bose Fellowship	Tharmalingam Punniyamurthy	SERB	Chemistry	9000000
Integration of group-III oxide and III-nitride-based wide bandgap semiconductors for next-generation electronics applications	Ankush Bag	INAE	Electronics and Electrical Engineering	4028466
Socio-economic development through natural dye based eri silk entrepreneurship among ethnic communities in Nagaon, Morigaon and Karbi Anglong districts of Assam	Bhuban Chandra Chutia	DST	Centre for the Environment	2580970
Thin film growth of Quantum Materials for spintronics, optoelectronics, and quantum computing applications	Malleswararao Tangi	IIT Guwahati	Physics	500000
Constant Potential-Quantum Mechanical Studies of Hydrogen Peroxide Generation with Single Atom Transition Metal Catalysts Substituted Oxide Substrates	Kalishankar Bhattacharyya	IIT Guwahati	Chemistry	1000000
Non-collinear antiferromagnets for spintronics-based data storage devices	Binoy Krishna Hazra	IIT Guwahati	Physics	500000

Synthesis of color-tunable, highly stable, and luminescent metal halide perovskite nanocrystals for fabrication of color-converting single-layer WLEDs and efficient metal ion detection in water	Saikat Bhaumik	IIT Guwahati	Physics	2000000
Injectable silk-based hydrogel system loaded with chemotherapeutic agent to treat canine mammary gland neoplasm	Biman B Mandal	DBT	School of Health Science and Technology	7490640
Framework for Resource-Resilient and Secure 5G V2X Communication	Moumita Patra	SERB	Computer Science and Engineering	2111164
The synthesis of hetero-element compounds with silicon-boron bonds and their stabilization using cyclic alkyl(amino) carbenes	Samir Kumar Sarkar	IIT Guwahati	Chemistry	500000
A Graphical Network Based Recommendation System Approach for Multimedia System	Chiranjib Sur	IIT Guwahati	Mehta School of Data Science and Artificial Intelligence	500000
Automated Stacking of Van der Waals Materials: Photonics in flatland	Rishi Maiti	IIT Guwahati	Physics	500000
Genome editing and genetic engineering for improvement in aroma, abiotic stress tolerance and yield of Kola Joha and Manipur Black Rice	Lingaraj Sahoo	DBT	Biosciences and Bioengineering	9515680
A Mechanistic Insight into the Effect of Hetero-atom Substitution on the Metal- mediated Aldehyde Deformylation Reactions	C V Sastri	Ministry of Education	Chemistry	3000000
Development and Manufacturing Technology for High Energy Density & Fast Charging Li-ion Batteries (>500 Wh kg-1) for Underwater Vehicles, and their Recycling Strategies	Ranjith Thangavel	Ministry of Earth Sciences	School of Energy Science and Engineering	7590400
Engineering CRISPR-based antimicrobials for selective targeting of drug resistant bacteria	B Anand	Ministry of Education	Biosciences and Bioengineering	4900000
Exploiting the Frustrated Lewis Pair and Frustrated Bronsted Pair Catalysis for Metal Free Hydrogenation And	Pavan Kumar Kancharala	Ministry of Education	Chemistry	4000000



Sustainable Hydrogen (Dehydrogenation) Release from Liquid Organic Hydrogen Carriers (LOHCs)				
Developing a post quantum lattice based block cipher	Dr. Srinivasan Krishnaswamy	Ministry of Education	Electronics and Electrical Engineering	9990000
Development of 6G THz Test Bed with Orbital Angular Momentum and Multiplexing	Ratnajit Bhattacharjee	Department of Telecommunication	Electronics and Electrical Engineering	56753400
Prototype Development of Low-Cost Resistive Humidity Sensor	Ravindra Kumar Jha	DST	Electronics and Electrical Engineering	3948434
Computer-Aided Molecular Design of Advanced Functional Materials	Debdas Dhabal	IIT Guwahati	Chemistry	500000
Antiferromagnets with collinear and non-collinear spin textures for the future spintronics device applications.	Binoy Krishna Hazra	DST	Physics	700000
Development of Jute Clay Liners (JCL) for Waste Containment Applications	T V Bharat	JUTE	Civil Engineering	2228300
Residential Teachers Training 2023-24	Prof. P. K. Iyer	Assam	Public Relations, Branding and Ranking	9834000
Transition metal-radical complexes as catalysts for electrochemical CO <sub>2</sub> reduction	C Mukherjee	CSIR	Chemistry	900000
Unravelling the Regulatory Mechanism that Connects Ribosome Biogenesis and Stringent Response with Bacterial Cell Growth	B ANAND	Ignite Life Science Foundation	Biosciences and Bioengineering	1000000
Distinguishing FIMP, WIMP and Hybrid Darkmatter Scenarios at the LHC	P Poullose	SERB	Physics	3157832
Mathematical Homogenization and Local Field Statistics in a Thermoelastic Composite with Unidirectional Fibers	Tarkes Dora Pallicity	IIT Guwahati	Mechanical Engineering	500000
Investigating The Coexistence of Radar and Communications for Present and Future Standards	Ribhu	SERB	Electronics and Electrical Engineering	660000
Development of a Novel Process for Effective Aluminum Recovery and Green Hydrogen Production from Aluminum Waste using a Thermochemical Cycle	FARUKH KHALIDL	SERB	School of Energy Science and Engineering	3036000

Implementation of Various RAA Activities and Tinkering Lab in Meghalaya	Prof. P. K. Iyer	Meghalaya	Public Relations, Branding and Ranking	135705000
Implementation of Secondary level RAA Activities and Tinkering Lab for SSA Assam	Prof. P. K. Iyer	Assam	Public Relations, Branding and Ranking	133318600
Artificial synapse for brain-inspired neuromorphic electronics hardware based on skyrmion-domain	Tanmoy Dutta	SERB	Electronics and Electrical Engineering	3201000
Integrated Quantum Photonics in Diamond	Vibhav Bharadwaj Shivakumar	IIT Guwahati	Physics	500000
Neural microcircuitry-inspired embedded neuromorphic design	Ayon Borthakur	IIT Guwahati	Mehta School of Data Science and Artificial Intelligence	500000
Data-driven optimization of surgical fixation technique by fast detection of femur fracture type from X-ray images: An AI based framework	Soutick Chanda	Ministry of Education	Biosciences and Bioengineering	2235000
Understanding the host metabolome to formulate effective diagnostics against dengue virus infection	Sachin Kumar	ICMR	Biosciences and Bioengineering	2856445
Distributed Authentication & Privacy Scheme (DAPS)	Ashok Singh Sairam	DST	Mathematics	840000
Visibility in Dynamic Polygonal Domains	R Inkulu	National Board of Higher Math,	Computer Science and Engineering	296500
A Chatter Prediction Approach in the Milling Process using Machine Learning Algorithms	Rinku Kumar Mittal	IIT Guwahati	Mechanical Engineering	1100000
“Development of high energy density and safer Solid-state battery for EV and ESS applications	Ranjith Thangavel	Indian Institute Of Technology Guwahati	School of Energy Science and Engineering	1500000
Testing and Characterization of Two-Dimensional Layered Materials Based Gas-Sensors	Ravindra k jha	IIT Guwahati	Electronics and Electrical Engineering	1250000
DEVELOPMENT OF NOVEL IMAGING MODELS FOR DIAGNOSTIC ULTRASOUND ELASTOGRAPHY	Manish Bhatt	IIT Guwahati	Electronics and Electrical Engineering	940000
Exploration of Flexible Power Distribution System Enabled by the Smart Transformer	Chandan Kumar	Humboldt Foundation	Electronics and Electrical Engineering	4700000

Spoof Surface Plasmon Polaritons-Based Passive Microwave Devices Including Antennas for Beyond Fifth-Generation Radio Stripe Network Applications	Rakshesh Singh Kshetrimayum	SERB	Electronics and Electrical Engineering	2653052
Tuning the Oxidative Strength of High-Valent Metal-Oxygen Adducts by Axial/Equatorial Ligand Perturbations	C V Sastri	SERB	Chemistry	4703913
Design and Analysis of OTFS-based Multi-user Terahertz Communication for 6G and Beyond	A. Rajesh	SERB	Electronics and Electrical Engineering	3090604
Cosmological and Gravitational Wave Signatures of Particle Dark Matter Models	D Borah	SERB	Physics	3038772
Security-by-Design in IoT: Securing IoT Protocols against Cyber Attacks in Industrial IoT Applications	Manas Khatua	DST	Computer Science and Engineering	2409145
Stereoselective Indolation of Alicyclic Amines: Asymmetric Synthesis of Taberdicatine C	Chandan Kumar Jana	SERB	Chemistry	3939760
Performance Evaluation of the Roads Constructed under PMGSY using New Technologies	Anjan Kumar Siddagangaiah	NRRDA	Civil Engineering	2739000
High order compact simulation of flow and transport in porous media	Jiten Chandra Kalita	SERB	Mathematics	4890317
Improving Privacy, Integrity and Availability for Durable and Secure Emerging Non-Volatile Memories	Hemangee K. Kapoor	DST	Computer Science and Engineering	5224252
Electron Attachment to Potential Radiosensitizers using a Local Complex Potential-based Time-Dependent Wavepacket Approach	Manabendra Sarma	SERB	Chemistry	660000
An AI-based control system for energy resiliency of critical facilities in remote areas	Prabir Barooah	SERB	Electronics and Electrical Engineering	4777270
Synthesis, Studies, and Strategic Applications of Carbon-Silicon Bond in Carbohydrate Chemistry	Pavan Kumar Kancharala	SERB	Chemistry	5470344
Effect of incorporation of meta-amino benzoic acid (MABA) and its derivatives on solubility and hIAPP-agonistic activity of Pramlintide.	BhubaneswarMandal	SERB	Chemistry	3971264

Co-cultivation of Spirulina sp. and Porphyridium sp. for simultaneous high yield production of phycocyanin and phycoerythrin at pilot scale	D Das	SERB	Biosciences and Bioengineering	3476264
SERB-Teachers Associateship for Research Excellence (TARE): Perturbed fractal splines and its Caputo-fractional derivative in the modelling of chaotic attractors	M GURU PREM PRASAD	SERB	Mathematics	1830000
Top and Higgs phenomenology of different left-right scenarios	Sumit Kumar Garg	SERB	Physics	1005000
Evaluation of Cervical Cancer Disease Progression and Testing Strategy by Point of Care Device &HPV Testing in HIV positive Women in Manipur	Rajiv Kumar Kar	ICMR	School of Health Science and Technology	17999640
PAC meeting for mid term monitoring and evaluation of project completion report (PCR) of the project under CRG: Chemical Engineering (CEE) during March 18-19, 2024	Prof. Vimal Katiyar	SERB	Chemistry	1774000
Setting up Center of Excellence (CoE) in Sustainable & Innovative Design and Manufacturing of Polymer Toys	Prof. Shrikrishna Nandkishor Joshi	CHEMICAL & PETROCHEMICALS	Mechanical Engineering	50000000

### Ongoing Sponsored Projects: 331

Project Title	PI Name	Funding Agency	Dept.	Sanctioned Amount
Recombinant Newcastle Disease Virus Based Breast Cancer Therapy: A Novel Oncolytic Viral Approach	Sachin Kumar	BBCI	Bioscience and Bioengineering	300000
Mechanistic investigations on the efficacy and mode of action of Ashwagandha Rasayana and Yogaraj Guggulu, using a hybrid Proteomics-Cheminformatics-Network medicine approach for the treatment of Osteoarthritis	Vibin Ramakrishnan	CPRI	Bioscience and Bioengineering	11164208
Cancer immunotherapy initiative In India (DUCI3): Repurposing anti-COVID19 immunity for cancer immunotherapy	Sachin Kumar	Dalhousie Medical Research Foundation	Bioscience and Bioengineering	873000

Production of recombinant Humanized monoclonal antibody, Ibalizumab and its variants from <i>Pichia pastoris</i>	Veeranki Venkata Dasu	ICMR	Bioscience and Bioengineering	4064336
Analysis of genome-wide restoration of estrogen regulated gene expression network post epigenetic reactivation of ERalpha in ER-negative breast cancer cells	Anil Mukund Limaye	ICMR	Bioscience and Bioengineering	2468465
Targeting osteoblast associated NCAM1 for chemosensitization of acute myeloid leukemia cells in the endosteal niche	Nitin Chaudhary	ICMR	Bioscience and Bioengineering	761000
Understanding the host metabolome to formulate effective diagnostics against dengue virus infection	Sachin Kumar	ICMR	Bioscience and Bioengineering	2856445
To capture and investigate physiologically relevant interactome in UPF3B knockout cells mimicking mental retardation (MR) patient's condition.	Kusum Kumari Singh	ICMR	Bioscience and Bioengineering	4343788
Identifying bacterial wilt resistant/tolerant tomato plant(s) by selective propagation of young tomato seedlings resistant/tolerant to prior <i>Ralstonia solanacearum</i> infection	Ranjan Tamuli	SERB	Bioscience and Bioengineering	1005000
Co-cultivation of <i>Spirulina</i> sp. and <i>Porphyridium</i> sp. for simultaneous high yield production of phycocyanin and phycoerythrin at pilot scale	Debasish Das	SERB	Bioscience and Bioengineering	3476264
Unravelling the Functional Mechanism of Target Recognition and Cleavage in an Unusual CRISPR-Cas System	Anand Baskaran		Bioscience and Bioengineering	5908760
3D printed patient specific meniscus implants with autologous biological cues for total and partial meniscus regeneration	Biman Behari Mandal	SERB	Bioscience and Bioengineering	4917264
Metabolic engineering of <i>Rhodococcus opacus</i> : A potential workhorse for lignin valorization into high-value lipids	Senthilkumar Sivaprakasam	DST	Bioscience and Bioengineering	5896264
Structural and functional studies of a putative membrane protein complex of <i>Mycobacterium tuberculosis</i> involved in invasion and cholesterol transport	Shankar Prasad Kanaujia	SERB	Bioscience and Bioengineering	4895264

In-silico, In-vitro and In-vivo evaluation of metabolites of curcumin as potential anti-inflammatory agents	Shankar Prasad Kanaujia	SERB	Bioscience and Bioengineering	1005000
Investigating the role of UTF1 in the generation of human induced pluripotent stem cells	Rajkumar Parshottambhai Thummer	DST	Bioscience and Bioengineering	5233905
Inter-organelle communications: deciphering their physiological relevance in Parkinson's disease model	Shirisha Nagotu	SERB	Bioscience and Bioengineering	4878764
Development of the Microwave-Photonic Hybrid Wearable Sensor for in vivo Monitoring of Hip Stem Micromovements	Souptick Chanda	SERB	Bioscience and Bioengineering	2035240
Development of Fe and Zn co-doped Hydroxyapatite for the Treatment of Osteomyelitis	Lalit Mohan Pandey	DST	Bioscience and Bioengineering	4625240
Engineering CRISPR-based antimicrobials for selective targeting of drug resistant bacteria	Anand Baskaran	Ministry of Education	Bioscience and Bioengineering	4900000
Gene expression analysis of the citral	Sachin Kumar	BORDOLOI BIOTECH INDIA PRIVATE LIMITED	Bioscience and Bioengineering	200000
Development of a Low Cost and Field Deployable Sensor for Detection of Formaldehyde Both in Liquid and Gaseous Forms	Pranab Goswami	DBT	Bioscience and Bioengineering	9479720
Development of Low Cost and Portable Field Deployable Methanol and Malaria Sensing Kits	Pranab Goswami	DBT	Bioscience and Bioengineering	100.74
Establishing Efficient Platform for Genetic Engineering and Precise Genome Editing in Tea	Lingaraj Sahoo	DBT	Bioscience and Bioengineering	3619840
Genome editing and genetic engineering for improvement in aroma, abiotic stress tolerance and yield of Kola Joha and Manipur Black Rice	Lingaraj Sahoo	DBT	Bioscience and Bioengineering	9515680
Development of nano-ensemble kit for the detection of clinically Relevant serum biomarkers.	Siddhartha Sankar Ghosh	DBT	Bioscience and Bioengineering	8663280

Mechanistic investigation on EMT targeted nanotherapeutics for drug-resistant triple-negative breast cancer cells	Siddhartha Sankar Ghosh	DBT	Bioscience and Bioengineering	14787600
Translational Programme for Developing Diagnostics and Nano-based Sensors (Main Project in continuation of the DBT program Support-II)	Siddhartha Sankar Ghosh	DBT	Bioscience and Bioengineering	28217320
DBT PAN IIT Center for Bioenergy: Phase II	Arun Goyal	DBT	Bioscience and Bioengineering	21932720
Bioengineered skin equivalent for treatment of burn injuries	Biman Behari Mandal	DBT	Bioscience and Bioengineering	1700000
Nanotechnological interventions in dental and bone metal implants: Tailoring smart, multifunctional interfaces towards improved osseointegrative and anti-bacterial properties	Biman Behari Mandal	DBT	Bioscience and Bioengineering	3825240
Elucidating structural aspects of antimicrobial peptide transporter in Escherichia coli: a study for structure-based drug designing	Shankar Prasad Kanaujia	DBT	Bioscience and Bioengineering	7095240
Insights to the proteolytic processing and regulation of Clp protease in Leptospira by its ATPase chaperone and adaptor proteins	Manish Kumar	DBT	Bioscience and Bioengineering	6595240
A novel safe strategy to generate integration-free human induced pluripotent stem cells using Newcastle Disease Virus as a gene delivery vector	Rajkumar Parshottambhai Thummer	DBT	Bioscience and Bioengineering	5950240
SwarnaJayanti Fellowship Grant	Biman Behari Mandal	SERB	Bioscience and Bioengineering	2500000
Modeling human liver microarchitecture and cellular physiology in vitro using 3D bioprinting for drug toxicity and high throughput drug screening applications	Biman Behari Mandal	DST	Bioscience and Bioengineering	30635040
Development of electronic composite materials for vibration energy harvesting, information transmission and virus detection	Lalit Mohan Pandey	DST	Bioscience and Bioengineering	652000
Data-driven optimization of surgical fixation technique by fast detection of femur fracture type from X-ray images: An AI based framework	Souptick Chanda	Ministry of Education	Bioscience and Bioengineering	2235000

The Development of Multidisciplinary Education in Circular Economy	Sudip Mitra	Finland	Centre for Disaster Management and Research	231375
Creation of DSIR-Common Research and technology Development Hub (CRTDH)	Vimal Katiyar	DSIR	Centre for Sustainable Polymers	50000000
Survey and Studies on Remediation of Microplastics on shorelines of Brahmaputra River	Vimal Katiyar	NEDFI	Centre for Sustainable Polymers	7740000
Sustainable Bioenergy and bioplastic production from bamboo waste.	Vimal Katiyar	DST	Centre for Sustainable Polymers	4654680
Tuning the Oxidative Strength of High-Valent Metal-Oxygen Adducts by Axial/Equatorial Ligand Perturbations	Chivukula Vasudeva Sastri	SERB	Chemistry	4703913
Synthesis and Characterization of Vanadium Oxoperoxo Complexes: Mimicking Vanadium Haloperoxidases	Biplab Mondal	SERB	Chemistry	1830000
Speech Technologies for North Eastern Languages	Rohit Sinha	DEITY	Centre for Linguistic Science and Technology	10576080
Transient Analysis of Hydrodynamic Coefficients Connected to Cylindrical Breakwaters	Swaroop Nandan Bora	SERB	Mathematics	1005000
SERB-Teachers Associateship for Research Excellence (TARE): Perturbed fractal splines and its Caputo-fractional derivative in the modelling of chaotic attractors	M. Guru Prem Prasad	SERB	Mathematics	1830000
Study of Truth Graphs: Applications in Logic gate and Cryptography	Bhaba Kumar Sarma	SERB	Mathematics	1830000
Robust Computational Methods for 2D Singularly Perturbed Parabolic Differential Equations	Natesan Srinivasan	SERB	Mathematics	1005000
Analysis of Nonstationary Queues	N. Selvaraju	SERB	Mathematics	660000
High order compact simulation of flow and transport in porous media	Jiten Chandra Kalita	SERB	Mathematics	4890317
Computing Multiplicities For Tensor Products On Special Linear Groups	Vinay Vilas Wagh	SERB	Mathematics	660000



A STUDY OF RANDIC MATRIX AND ABC MATRIX OF GRAPHS	Bikash Bhattacharjya	SERB	Mathematics	1005000
State Transfer on Graphs of Groups, Rings and Partial Cartesian Products	Bikash Bhattacharjya	SERB	Mathematics	660000
The Maximal Dispersion in Metric Space	Gautam Kumar Das	SERB	Mathematics	660000
Radial solution to the wave equation and spherical mean operator on symmetric spaces	Pratyosh Kumar	SERB	Mathematics	660000
Generalization of Cartwright's Theorem	Rajesh Kumar Srivastava	SERB	Mathematics	660000
Weak Galerkin Finite Element Method for Westervelt's Equation	Bhupen Deka	SERB	Mathematics	660000
Weak Galerkin Finite Element Methods for Maxwell's Equations with Discontinuous Coefficients	Bhupen Deka	SERB	Mathematics	2774992
Multi-variable Trace formulae on symmetric spaces	Arup Chattopadhyay	SERB	Mathematics	2554992
Distribution of certain partition functions	Rupam Barman	SERB	Mathematics	2730882
Risk-sensitive stochastic games for continuous-time stochastic processes.	Chandan Pal	SERB	Mathematics	660000
Mathematical modelling of flow and transport in porous media: A homogenization approach	Satyajit Pramanik	SERB	Mathematics	1709400
Modeling and simulation of premelting dynamics with impurities	Satyajit Pramanik	SERB	Mathematics	660000
Distributed Authentication & Privacy Scheme (DAPS)	Ashok Singh Sairam	DST	Mathematics	840000
On homogenization techniques for flow and transport through rigid and deformable porous media	Satyajit Pramanik	IIT Guwahati	Mathematics	500000

Development of an Artificial Intelligence(AI) Model to Measure and Analyse the Tissue Movements in the Eye Region for Healthcare Applications.	Debanga Raj Neog	SERB	Mehta Family School of Data Science and Artificial Intelligence	1981470
Internet-of-Things Network Scheduling in a Reinforcement Learning-aided Mobile Edge Computing System	Arghyadip Roy	SERB	Mehta Family School of Data Science and Artificial Intelligence	1948470
Listening to the body - Analyzing respiratory sound signals for design of AI-based disease screening methodologies	Neeraj Kumar Sharma	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
A Graphical Network Based Recommendation System Approach for Multimedia System	Chiranjib Sur	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Neural microcircuitry-inspired embedded neuromorphic design	Ayon Borthakur	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Development of Automated Surveillance System for All Weather using Deep Learning	Prashant Wagambar Patil	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Algorithm-based prevention and reduction of cancer health disparity for data-disadvantaged population	Teena Sharma	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Statistical Inferences under Censored Data	Amulya Kumar Mahto	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Development of porous, ordered, monolithic MXene based sodium ion hybrid capacitors	Uday Narayan Maiti	BRNS	Centre for Nanotechnology	2834126
Indian Nanoelectronics Users Programme - Idea to Innovation (INUP-i2i)	Dipankar Bandypadhyay	DEITY	Centre for Nanotechnology	92300000
SWASTHA Smart Wearable Advanced nanoSensing Technologies in Healthcare ASICs	HOC NANO	DEITY	Centre for Nanotechnology	153508000

Centre for Excellence in Disruptive Innovations and Product Development for Affordable Rural Healthcare	Dipankar Bandypadhyay	ICMR	Centre for Nanotechnology	150694315
Assembly of Nanoscale Particles for Theranostic and Energy Applications Sanction order no JCB/2019/000039	Arun Chattopadhyay	SERB	Centre for Nanotechnology	9500000
Understanding multiphase flow in curved tubular reactors in the presence of diffusion and reaction	Raghvendra Gupta	SERB	Centre for Nanotechnology	3406926
Collaborative Research for Accelerated Development of Materials & devices for Energy harvesting and conservation Technologies	Ankush Bag	DST-DAAD	Centre for Nanotechnology	8586383
"Development of pigmented rice based antioxidant-rich traditional and innovative food products as adaptogens for reducing oxidative stress".	Siddhartha Singha	DRDO	School of Agro and Rural Technology	13764000
Assessment of Bioavailability of Microplastics in Soils and their Remediation through Biochar Prepared from Locally Available Agro-horti Refuse	Sudip Mitra	SERB	School of Agro and Rural Technology	4812000
Exploration of Underutilized Amaranthus species for Sustainable "Livelihood, Nutritional Security and Climate Resilience of Western Himalayan Region	Latha Rangan	DBT	School of Agro and Rural Technology	3900240
Development of a novel bio-composite thermal energy storage material and its applications in isothermal drying of agricultural products and passive cooling of building	Pankaj Kalita	ASTEC	School of Energy Science and Engineering	655500
Gasification of Agro Residues and Municipal Solid Wastes for decentralized power generation	Pankaj Kalita	DRDO	School of Energy Science and Engineering	276000
'Integrated approach for extraction of valuable chemicals using Subcritical water extraction, followed by production of biobutanol from Scenedesmus sp. using genetically engineered Clostridium strain	Vaibhav Vasant Goud	DST/GITA	School of Energy Science and Engineering	3557580

Development and Manufacturing Technology for High Energy Density & Fast Charging Li-ion Batteries (>500 Wh kg-1) for Underwater Vehicles, and their Recycling Strategies	Ranjith Thangavel	Ministry of Earth Sciences	School of Energy Science and Engineering	7590400
Studies on efficacy of upgradation and utilization of north eastern coal and biomass for gasification in a plant prototype and its scale up	Pankaj Kalita	Ministry of Power	School of Energy Science and Engineering	6594000
Design, fabrication, and installation of raw MSW to charcoal conversion system at NTPC Ramagundam township	Senthilmurugan Subbiah	NTPC Ramaguntam	School of Energy Science and Engineering	74,79,000
Developing Next-generation High Energy Density Sodium Metal Batteries using Dendrite Free and Safer Sodium Metal Anode	Ranjith Thangavel	SERB	School of Energy Science and Engineering	3080000
Development of a Novel Process for Effective Aluminum Recovery and Green Hydrogen Production from Aluminum Waste using a Thermochemical Cycle	Farrukh Khalid	SERB	School of Energy Science and Engineering	3036000
Development of a novel dual fluidized bed gasification technology package for effective utilization of biomass and NE coal for efficient energy harvesting.	Pankaj Kalita	SERB	School of Energy Science and Engineering	5131240
Catalytic Hydrodeoxygenation of pyrolytic-oil produced from copyrolysis of agricultural residue and plastic waste	Kaustubha Mohanty	DST	School of Energy Science and Engineering	6866337
“Development of high energy density and safer Solid-state battery for EV and ESS applications	Ranjith Thangavel	Indian Institute Of Technology Guwahati	School of Energy Science and Engineering	1500000
Development of Experimental Validation Platform for Control of Power Electronics Interfaces for Distributed Energy Resources and Microgrids	E S N RAJU P	IIT Guwahati	School of Energy Science and Engineering	1000000
Control Scheme for the Grid-forming Services for the Electrolyzer-Fuel cell System	Kuldeep Kumar	IIT Guwahati	School of Energy Science and Engineering	500000

Electrolytic Production of Methanol at Ambient Pressure using Thermochemical Cycle	Farrukh Khalid	IIT Guwahati	School of Energy Science and Engineering	500000
HIGH ENERGY DENSITY NICKEL-RICH CATHODE FOR NEXT-GENERATION LITHIUM-ION BATTERIES	Ranjith Thangavel	IIT Guwahati	School of Energy Science and Engineering	500000
Evaluation of Cervical Cancer Disease Progression and Testing Strategy by Point of Care Device &HPV Testing in HIV positive Women in Manipur	Rajiv Kumar Kar	ICMR	Jyoti and Bhupat Mehta school of Health Science and Technology	17999640
Understanding on/off kinetics of LOV-domain proteins to construct optogenetic tools	Rajiv Kumar Kar	SERB	Jyoti and Bhupat Mehta school of Health Science and Technology	28,08,340
Characterizing the functional role of the novel dopaminergic transmembrane protein p20MANI (Myelin-Associated Neurite Inhibitor)	Subrata Pramanik	SERB	Jyoti and Bhupat Mehta school of Health Science and Technology	3249400
Injectable silk-based hydrogel system loaded with chemotherapeutic agent to treat canine mammary gland neoplasm	Biman Behari Mandal	DBT	Jyoti and Bhupat Mehta school of Health Science and Technology	7490640
Uncovering the dual function, cell proliferation and neurite outgrowth, of the  SRGAP2-FAM72-  Master Gene in Neuroplasticity	Subrata Pramanik	IIT Guwahati	Jyoti and Bhupat Mehta school of Health Science and Technology	500000
Development of Automated Surveillance System for All Weather using Deep Learning	Prashant Wagambar Patil	IIT Guwahati	Mehta Family School of Data Science and Artificial Intelligence	500000
Development of low cost transition metal based catalysts for electro-oxidation of poly-alcohols for application in Fuel Cells	Mahuya De	DST	School of Energy Science and Engineering	5538764
Lignocellulosic biomass utilization for lactic acid and bioethanol production	Arun Goyal	DBT	School of Energy Science and Engineering	3710240
Coursera	HOC CET	Coursera	Centre for Educational Technology	0

Biodegradable Toys Centre for Sustainable Livelihood Empowerment of ST community "(GREEN Putola Centre)" Green toys from Assam.	Vimal Katiyar	DST	Centre for Sustainable Polymers	23284710
Life-Like Systems: Fuel-Driven Temporal Control Over Self-Assemblies Utilizing Ternary Complexation of Cucurbit[8]uril	Debapratim Das	BRNS	Chemistry	3451100
Synthesis of Enantioriched Unsaturated Oxygen and Nitrogen Containing Heterocycles	Tharmalingam Punniyamurthy	CSIR	Chemistry	1400000
Cancer immunotherapy: Inhibition of Immunosuppressive Indoleamine 2,3-Dioxygenase 1 Enzyme Activity by targeting the Heme and Apo-form	Debasis Manna	CSIR	Chemistry	2666000
Transition metal-radical complexes as catalysts for electrochemical CO <sub>2</sub> reduction	Chandan Mukherjee	CSIR	Chemistry	900000
Rational drug discovery and development of potent inhibitors of an epigenetic marker, BRD2: A potential therapeutic target for glioblastoma	Krishna Pada Bhabak	ICMR	Chemistry	618000
A Mechanistic Insight into the Effect of Hetero-atom Substitution on the Metal- mediated Aldehyde Deformylation Reactions	Chivukula Vasudeva Sastri	Ministry of Education	Chemistry	3000000
Development of low cost sustainable and efficient electro-catalyst and proton exchange membrane for electrolyser assembly for producing Green Hydrogen	Mahuya De	OTHER	Chemistry	5559400
Synthesis of New Heterocyclic Entities and Their Applications in Biological and Material Science	Abu Taleb Khan	DST	Chemistry	2387000
Radical Induced Visible-Light Mediated Nitrile Trigger Cascade Synthesis of Heterocyclic Scaffolds	Bhisma Kumar Patel	SERB	Chemistry	5783492
Photoactive Electron Donor-Acceptor (EDA) Complex as Photochemical Synthetic Tools	Bhisma Kumar Patel	SERB	Chemistry	6525270
Study of Metallaphotoredox Catalysis for Tandem C-H Functionalization and Annulation	Tharmalingam Punniyamurthy	SERB	Chemistry	5400000

Study of Site-Selective Functionalization of C(Sp <sup>3</sup> )-H Bonds Using Transition-Metal-Catalysis	Tharmalingam Punniyamurthy	SERB	Chemistry	2978916
J C Bose Fellowship	Tharmalingam Punniyamurthy	SERB	Chemistry	9000000
Synthesis of nitrogen heterocyclic compounds from alkynes, nitriles and study of their biological activity	Anil Kumar Saikia	SERB	Chemistry	4873264
Effect of incorporation of meta-amino benzoic acid (MABA) and its derivatives on solubility and hIAPP-agonistic activity of Pramlintide.	Bhubaneswar Mandal	SERB	Chemistry	3971264
Electron Attachment to Potential Radiosensitizers using a Local Complex Potential-based Time-Dependent Wavepacket Approach	Manabendra Sarma	SERB	Chemistry	660000
Synthesis and Characterization of novel Dinuclear Metal Complexes for peroxidic epoxidation	Chivukula Vasudeva Sastri	SERB	Chemistry	1830000
Ion Therapy: Synthesis and Optimization of Small molecule-based Selective Anionophores for Next-Generation Anticancer Agents	Debasis Manna	SERB	Chemistry	4694151
Utilization of CO <sub>2</sub> by Electrocatalytic Conversion to Value-Added Products	Chandan Mukherjee	SERB	Chemistry	2222000
Metal Free Aminative C-O Cleavage of $\alpha$ -Oxycarbonyls: Expeditious Access to Aminoalcohols-Based Antidepressants	Chandan Kumar Jana	SERB	Chemistry	3850000
Stereoselective Indolation of Alicyclic Amines: Asymmetric Synthesis of Taberdicine C	Chandan Kumar Jana	SERB	Chemistry	3939760
Localized Therapeutic Delivery Systems Based on Water Insoluble Thixotropic Hydrogels of Small Peptides for Breast Cancer Treatment	Debapratim Das	SERB	Chemistry	5236000
Fuel Triggered Temporal Control over Self-Assemblies to Develop Life-Like Systems	Debapratim Das	SERB	Chemistry	1830000
Catalytic Asymmetric Intramolecular Allylic Substitution Reactions	Subhas Chandra Pan	SERB	Chemistry	4189928

Synthesis, supramolecular polymerization and optoelectronics applications of peri-naphthoindigo derivatives	Kingsuk Mahata	SERB	Chemistry	4264634
Systematic Investigation of Oil/Water Separation Performances of a Family of Superhydrophobic Metal-Organic Framework (MOF) Based Composites	Shyam Prosad Biswas	SERB	Chemistry	3520264
Comprehensive Exploration of Water-Stable, Functionalized Metal-Organic Frameworks for Fluorometric Detection of Heavy Metal Ions	Shyam Prosad Biswas	SERB	Chemistry	3960000
Extraction of Electrical Energy from Hydrological Cycle through Two-dimensional Nanofluidic Channels	Kalyan Raidongia	SERB	Chemistry	1005000
Applicability of Group-7 Transition Metals (Mn and Re) for the Utilization of Carbon Dioxide in Organic Synthesis	Dipankar Srimani	SERB	Chemistry	2101000
Synthesis of mesoporous transition metal doped g-C <sub>3</sub> N <sub>4</sub> and Photocatalytic phosphinylation of alkenes and synthesis of biologically relevant heterocycles	Dipankar Srimani	SERB	Chemistry	1830000
Stimuli-responsive Prodrugs for the Turn-On Fluorogenic and Targeted Delivery of Anti-Inflammatory and Anti-Cancer Drugs with Hydrogen Sulfide (H <sub>2</sub> S)	Krishna Pada Bhabak	SERB	Chemistry	3487264
Bio-analyte-triggered Turn-on Fluorogenic Processes with the Adjuvant Delivery of Specific Enzyme Inhibitors and Gasotransmitters for the Treatment of Cancer	Krishna Pada Bhabak	SERB	Chemistry	5640000
Natural Ingredient based Reactive Coating for Controlled Customization of Robust Super-Wettability & Adhesion of Liquid and Air	Uttam Manna	SERB	Chemistry	6442782
Waste to Value-Added Chemicals: An One-Pot One-Step Strategy for the Pincer-Ruthenium and Pincer-Iron Catalyzed Transformation of Glycerol Selectively to Lactic Acid Along with a Tandem Conversion of Carbon Dioxide to Formic Acid	Akshai Kumar Alape Seetharam	SERB	Chemistry	5016264
Synthesis, Studies, and Strategic Applications of Carbon-Silicon Bond in Carbohydrate Chemistry	Pavan Kumar Kancharla	SERB	Chemistry	5470344



Improving the substrate binding and catalytic reaction by electron-poor metal pincer complexes and reductively stable secondary-sphere hydrogen-bond donors	Animesh Das	DST	Chemistry	4475211
Exploiting the Frustrated Lewis Pair and Frustrated Bronsted Pair Catalysis for Metal Free Hydrogenation And Sustainable Hydrogen (Dehydrogenation) Release from Liquid Organic Hydrogen Carriers (LOHCs)	Pavan Kumar Kancharla	Ministry of Education	Chemistry	4000000
Development of sustainable agriculture practices for biotic and abiotic stress management in conventional and organic tea plantations	Uttam Manna	DBT	Chemistry	5450240
Affordable Renewable Energy Materials and Devices	Parameswar K Iyer	DST	Chemistry	7562390
Constant Potential-Quantum Mechanical Studies of Hydrogen Peroxide Generation with Single Atom Transition Metal Catalysts Substituted Oxide Substrates	Kalishankar Bhattacharyya	IIT Guwahati	Chemistry	1000000
The synthesis of hetero-element compounds with silicon-boron bonds and their stabilization using cyclic alkyl(amino) carbenes	Samir Kumar Sarkar	IIT Guwahati	Chemistry	500000
Computer-Aided Molecular Design of Advanced Functional Materials	Debdas Dhabal	IIT Guwahati	Chemistry	500000
ULTRASONIC WASHING FOR DESULFURIZATION OF COAL	Prabu Vairakannu	Central Mine Planning & Design Institute Limited (CMPDI)	Chemical Engineering	19735000
Process development for tea Aroma recovery and concentration	Senthilmurugan Subbiah	EKATERRA RESEARCH AND DEVELOPMENT INDIA PRIVATE LIMITED	Chemical Engineering	3683600
Spring School 2023	Chandan Das	,,,	Chemical Engineering	412272

Development of advanced biofuels and bio lubricants from high lipid producing microalgal strain through HTL and Co-HTL process	Kaustubha Mohanty	GSBTM	Chemical Engineering	3899586
Patient-Specific Hemodynamics in Coronary Circulation	Raghvendra Gupta	ICMR	Chemical Engineering	3693173
Development of Novel Ternary Composite Membrane with High Selectivity for Direct Methanol Fuel Cell Applications	Bishnupada Mandal	SERB	Chemical Engineering	7432260
Design and development of a microfluidic device for particle fractionation from concentrated suspensions	Anugrah Singh	SERB	Chemical Engineering	3463000
Voltammetric And Conceptual DensityFunctional Studies On Electrocatalysis OfSurfactants At The Graphene Screen-PrintedGraphene Electrode For Detection Of PersistentOrganic Pollutants	Kaustubha Mohanty	SERB	Chemical Engineering	335000
Formulation of membrane based Micro Reactor for decontamination cum denitration of nitrate bearing effluents and conversion to valuable products	Chandan Das	SERB	Chemical Engineering	3923260
Sugars Conversion to Bio-based Monomeric molecules	Nageswara Rao Peela	SERB	Chemical Engineering	4020000
Online Health Monitoring and Point-of-use Testing for Batteries Using Chirp Signals	Resmi Suresh M.P	SERB	Chemical Engineering	3828260
Experimental and Numerical Investigation for Miscible Carbon Dioxide-Enhanced Oil Recovery (CO <sub>2</sub> -EOR) and Simultaneous Geo-Sequestration in North-East India	Sumit Kumar	SERB	Chemical Engineering	3236200
DEVELOPMENT OF HIGH MOLECULAR WEIGHT AQUEOUS VISCOELASTIC POLYMER COMPOSITES FOR ENHANCED OIL RECOVERY FROM MATURED INDIAN RESERVOIR	Abhijit Kakati	SERB	Chemical Engineering	3270900
Development of a cost-effective device for oxygen separation from air: a strategic technological solution to control the food spoilage	Tapas Kumar Mandal	DST	Chemical Engineering	1913801

LOW-cost innovative Technology for water quality monitoring and water resources management for Urban and rural water Systems in India (LOTUS)	Senthilmurugan Subbiah	DST	Chemical Engineering	23271000
Incorporation of advanced technology as Retrofitting for the removal of Fluoride from the PWSS at (a) Nizbbogai (b) Rajapara 2 and (c) Sakhati, in Boko town of Kamrup District, Assam.	Mihir Kumar Purkait	Jal Jeevan Mission (NJJM)	Chemical Engineering	16005000
JJM Chair Professor	Mihir Kumar Purkait	Govt of India	Chemical Engineering	68331600
Study on the role of viscoelastic behaviour of aqueous polymer solution in pore level microscopic displacement of crude oil from reservoir rocks	Abhijit Kakati	IIT Guwhati	Chemical Engineering	500000
Unified platform for Social Media Content Analytics	Sanasam Ranbir Singh	DEITY	Computer Science and Engineering	17650000
Traceable Value Chain for safe pork in the North Eastern Region of India	Sukumar Nandi	ICAR	Computer Science and Engineering	4015142
Visibility in Dynamic Polygonal Domains	Rajasekhar Inkulu	National Board of Higher Math,	Computer Science and Engineering	296500
Games and Controller Synthesis	Purandar Bhaduri	SERB	Computer Science and Engineering	660000
Improving Privacy, Integrity and Availability for Durable and Secure Emerging Non-Volatile Memories	Hemangee Kalpesh Kapoor	DST	Computer Science and Engineering	5224252
Enhancing Security Features of On-chip Networks in Modem Multicore Processors	John Jose	SERB	Computer Science and Engineering	5071924
Security Enhancement Techniques for Multi-core Processors	John Jose	SERB	Computer Science and Engineering	1005000
Framework for Resource-Resilient and Secure 5G V2X Communication	Moumita Patra	SERB	Computer Science and Engineering	2111164
Security-by-Design in IoT: Securing IoT Protocols against Cyber Attacks in Industrial IoT Applications	Manas Khatua	DST	Computer Science and Engineering	2409145

Design of Educational Metaverse as an extension of Virtual Reality (VR) zone	Keyur Babulal Sorathia	Guwahati Planetarium Management Society	Design	10000000
M. Des Programme / Executive Development Programme in Electronics Product Design	Udaya Kumar Dharmalingam	MIETY	Design	180211000
Research and Development Program for Promotion of Handloom in North-Eastern Region (Assam)	Sougata Karmakar	North East Council	Design	1353072
Additive manufacturing of architected metamaterial with hybrid fused filament fabrication for functional product design	Ajeet Kumar	IIT Guwahati	Design	500000
Exploration of Flexible Power Distribution System Enabled by the Smart Transformer	Chandan Kumar	Humboldt Foundation	Electronics and Electrical Engineering	4700000
AI/ML- based Channel Estimation and Beamforming for mmWave MIMO-OTFS in 6G	Kuntal Deka	DST	Electronics and Electrical Engineering	3780966
Integration of group-III oxide and III-nitride-based wide bandgap semiconductors for next-generation electronics applications	Ankush Bag		Electronics and Electrical Engineering	4028466
Design and Development of AI/ML Co-Processor and Post Quantum Cryptography Co-Processor (An initiative towards Electronics System Design and Manufacturing in North-East Region)	Gaurav Trivedi	DEITY	Electronics and Electrical Engineering	199990000
Design, prototype, testing and control of 30kW high power density motors for EV application.	Praveen Kumar	MEITY	Electronics and Electrical Engineering	4327000
AI/ML for Beamforming in 6G	Kuntal Deka	Opetushallitus Utbildningsstyrelsen	Electronics and Electrical Engineering	1008000
Powering the Ultra-Low-Power Wireless System/IoT Node by Scavenging Multi-Band Radio Frequency (RF) Energy	Roy Paily Palathinkal	SERB	Electronics and Electrical Engineering	1937760
Spoof Surface Plasmon Polaritons-Based Passive Microwave Devices Including Antennas for Beyond Fifth-Generation Radio Stripe Network Applications	Rakesh Singh Kshetrimayum	SERB	Electronics and Electrical Engineering	2653052

Design and Analysis of OTFS-based Multi-user Terahertz Communication for 6G and Beyond	A. Rajesh	SERB	Electronics and Electrical Engineering	3090604
Design and development of real-time semantic segmentation networks and the corresponding FPGA-ASIC based hardware accelerators for possible deployment in commercial prototype for autonomous driving	Shaik Rafi Ahamed	SERB	Electronics and Electrical Engineering	2875302
Development of a prototype of disabled-friendly automatic virtual text-entry keyboard interface system	Manas Kamal Bhuyan	SERB	Electronics and Electrical Engineering	2301025
Sign Language Translator for Identification of Health Conditions of the Deaf and Dumb Population for Medical Attention.	Manas Kamal Bhuyan	SERB	Electronics and Electrical Engineering	1754016
Contraction Analysis and Resilient Control Design for Nonlinear Cyber-physical Systems under Denial-of-Service	Indrani Kar	SERB	Electronics and Electrical Engineering	660000
Intelligent Disturbance Observer based Adaptive Control of DC-DC Power Converter for Nonlinear Loads	Praveen Kumar	SERB	Electronics and Electrical Engineering	1005000
Nanofilled natural ester impregnated surface modified pressboards for suppressing partial discharges in transformers.	Sisir Kumar Nayak	SERB	Electronics and Electrical Engineering	5073024
Fabrication and demonstration of a state-of-the-art C-band optical modulator in silicon photonics platform for 400G networks	Ramesh Kumar Sonkar	SERB	Electronics and Electrical Engineering	3927264
Design and fabrication of 2D photonic crystal devices for data center applications	Ramesh Kumar Sonkar	SERB	Electronics and Electrical Engineering	4773516
DC side low-frequency ripple reduction in SBI and q-SBI based PV system with non-linear local loads and distorted PCC voltage.	Ravindranath Adda	SERB	Electronics and Electrical Engineering	3509000
Development of Digital Twin for PEM fuel cell-battery hybrid energy system for vehicular applications	Sanjib Ganguly	SERB	Electronics and Electrical Engineering	2866900
Development of smart transformer-based electric vehicle charging station with high PV penetration	Chandan Kumar	SERB	Electronics and Electrical Engineering	2871264

Investigating The Coexistence of Radar and Communications for Present and Future Standards	Ribhu	SERB	Electronics and Electrical Engineering	660000
Intelligent Reflecting Surface Enabled Simultaneous Wireless Energy and Information Transfer in Next Generation IoT Networks: System Design, Optimization and Performance Analysis	Salil Kashyap	SERB	Electronics and Electrical Engineering	2376180
Study of quantum noise control techniques using Low Density Parity Check codes	Arun B. Alosious	DST	Electronics and Electrical Engineering	1949920
Edge Computing Enabled Active Distribution Network Monitoring Considering Cyber-Threats	Sreenath J. G	SERB	Electronics and Electrical Engineering	780520
Cooperative Control of Networked Multi-agent Systems utilizing Negative Imaginary Theory with an Application to Multi-robot Systems	Parijat Bhowmick	SERB	Electronics and Electrical Engineering	940500
Advanced imaging methods for fatty liver diagnosis with ultrasound elastography	Manish Bhatt	SERB	Electronics and Electrical Engineering	2002000
Design of Various Algorithms for Terahertz Communication in 6G and Beyond	Kuntal Deka	DST	Electronics and Electrical Engineering	429000
Phase Optimization and Performance Analysis of Intelligent Reflecting Surface Assisted Wireless Communication Systems over Generalized Fading Channels	Kuntal Deka	SERB	Electronics and Electrical Engineering	660000
Generation of non-diverging circular airy orbital angular momentum beams for next generation wireless communication technology.	Ashwini Sawant	SERB	Electronics and Electrical Engineering	2997300
Indigenous design and development of wideband tunable dosimeters for UV exposed environment	Ankush Bag	SERB	Electronics and Electrical Engineering	5755172
Secure and Reliable Techniques for Deep Learning-based 5G and Beyond Wireless Systems	Manoj B R	SERB	Electronics and Electrical Engineering	3071640
Artificial synapse for brain-inspired neuromorphic electronics hardware based on skyrmion-domain	Tanmay Dutta		Electronics and Electrical Engineering	3201000

An AI-based control system for energy resiliency of critical facilities in remote areas	Prabir Barooah	SERB	Electronics and Electrical Engineering	4777270
Development of 6G THz Test Bed with Orbital Angular Momentum and Multiplexing	Ratnajit Bhattacharjee	Department of Telecommunication	Electronics and Electrical Engineering	56753400
Developing a post quantum lattice based block cipher	Srinivasan Krishnaswamy	Ministry of Education	Electronics and Electrical Engineering	9990000
Centre for depression diagnosis and medication adherence	Hanumant Singh Shekhawat	DBT	Electronics and Electrical Engineering	10522600
Design, Development, and Demonstration of Solar-PV integrated On-board and Off-board Electric-Rickshaw Charging Infrastructure	Ravindranath Adda	DST	Electronics and Electrical Engineering	6773970
Prototype Development of Low-Cost Resistive Humidity Sensor	Ravindra Kumar Jha	DST	Electronics and Electrical Engineering	3948434
Machine-Learning Enabled Next-Generation IoT Communications (MAGICO)	Kuntal Deka	DST	Electronics and Electrical Engineering	2518146
Machine Learning Techniques to Address the Pilot Transmission Overhead in an Intelligent Reflecting Surface Aided Antenna Selection System	Sarvendranath Rimalapudi	DST	Electronics and Electrical Engineering	3500000
Securing low-power embedded processors for IoT applications against power-analysis attacks	Roy Paily Palathinkal	Semiconductor Research Corporation	Electronics and Electrical Engineering	3476569
Testbed for vision-based control of unmanned vehicles	Chayan Bhawal	IIT Guwahati	Electronics and Electrical Engineering	500000
Integrating Massive MIMO in Dense Cooperative Cellular Deployment	Sudarshan Mukherjee	IIT Guwahati	Electronics and Electrical Engineering	550000
Testing and Characterization of Two-Dimensional Layered Materials Based Gas-Sensors	Ravindra Kumar Jha	IIT Guwahati	Electronics and Electrical Engineering	1250000
DEVELOPMENT OF NOVEL IMAGING MODELS FOR DIAGNOSTIC ULTRASOUND ELASTOGRAPHY	Manish Bhatt	IIT Guwahati	Electronics and Electrical Engineering	940000

SCO - Smart Cabin for Office for monitoring the well-being of office staff as well as ambience	Anirban Dasgupta	IIT Guwahati	Electronics and Electrical Engineering	485000
Growth Tool Development for Gallium Oxide Devices	Ankush Bag	IIT Guwahati	Electronics and Electrical Engineering	500000
Study and optimization of stray field in magnetic tunnel junction (MTJ)	Tanmay Dutta	IIT Guwahati	Electronics and Electrical Engineering	500000
Virtual Energy Storage from Smart Appliances: Extension to the Indian Context	Prabir Barooah	IIT Guwahati	Electronics and Electrical Engineering	494415
Development of animal feed products from Eri Silkworm	Utpal Bora	DRDO	Centre for the Environment	3307208
Prototype development for catechins extraction and production of low cost antioxidants tablets and capsules	Mihir Kumar Purkait	INAE	Centre for the Environment	5700000
Bio-surfactant mediated enhanced oil recovery for Assam oil reservoirs	Lalit Mohan Pandey	DBT	Centre for the Environment	3640000
Socio-economic development through natural dye based eri silk entrepreneurship among ethnic communities in Nagaon, Morigaon and Karbi Anglong districts of Assam	Utpal Bora	DST	Centre for the Environment	2580970
Sustainable, Biodegradable and Affordable Substitutes for 'Single use Plastic' using Castor Oil and Stubble Aggregate	Tamal Banerjee	DST	Centre for the Environment	3091737
Water transformation pathways planning, trans-path-planning.	Anamika Barua	IHE Delft	Humanities and Social Sciences	23398445.06
Annotated Atlas of the Heritage Sites of Assam: Using GIS	Sukanya Sharma	State Innovation and Transformation Aayog (SITA)	Humanities and Social Sciences	4000000
Bilingual experience? in heritage language speakers and its impact on cognitive control: Creating data base from varying socio-cultural background	Bidisha Som	DST	Humanities and Social Sciences	4810751
Eating Healthy Food in Urban India: The Role of Digital Technology	Rituparna Patgiri	IIT Guwahati	Humanities and Social Sciences	448747
Astronomical Orientations of Ancient Temples	Tadikonda Venkata Bharat	AICTE	Centre for Indian Knowledge Systems	1650000



Towards Reinstatement of Ancient Soil Classification System	Tadikonda Venkata Bharat	AICTE	Centre for Indian Knowledge Systems	1727200
Development of Sm <sub>5</sub> Fe <sub>17</sub> based composite magnets with ultrahigh coercivity for green energy generation applications	Perumal Alagarsamy	DRDO	Physics	3026600
Collective neutrino flavor conversion in astrophysics and cosmology	Sovan Chakraborty	DST	Physics	660000
Development of high performance flexible photodetector array through plasmonic hot-carrier engineering in two-dimensional perovskites	Pravat Kumar Giri	DST	Physics	4400301
Distinguishing FIMP, WIMP and Hybrid Darkmatter Scenarios at the LHC	Poulose Poulose	SERB	Physics	3157832
Top and Higgs phenomenology of different left-right scenarios	Poulose Poulose	SERB	Physics	1005000
Mechanochemical synthesis of high entropy oxides with tunable entropies for energy harvesting using hybrid nanogenerators	Perumal Alagarsamy	SERB	Physics	3542000
Electroweak baryogenesis as a portal to neutrino and dark matter	Arunansu Sil	SERB	Physics	660000
Investigating the post-inflationary era with axions and ALPs	Arunansu Sil	SERB	Physics	2396427
Investigation of the Reentrant Disordered Behavior and Catalytic Properties of Frustrated Pyrochlore Nanostructures	Subhash Thota	DST	Physics	6171000
Matter Radii of Efimovian D <sub>0nn</sub> System Using Faddeev Equations	Udit Raha	SERB	Physics	660000
Precision determination of lepton-proton chiral - radiative corrections in Effective Field Theory	Udit Raha	SERB	Physics	2388449
'Ringing', 'Echoes' and 'Shadows': a study on different properties of astrophysical compact objects	Sayan Kumar Chakrabarti	SERB	Physics	660000
Exploring tunable electromagnetic induced transparency effect using exotic materials in terahertz metamaterials	Gagan Kumar	SERB	Physics	825000
Exploring Parity-Time symmetry effect in metasurfaces for terahertz photonics	Gagan Kumar	SERB	Physics	577500

Development of high-performance supercapacitors in ?water-in-salt? electrolytes with current pulse induced electro-physical modification of metal-organic-frameworks	Uday Narayan Maiti	SERB	Physics	3416468
Cogenesis of Baryon Asymmetry and Dark Matter from Inflaton	Debasish Borah	SERB	Physics	660000
Cosmological and Gravitational Wave Signatures of Particle Dark Matter Models	Debasish Borah	SERB	Physics	3038772
Neutrino Astrophysics with next generation Water Cherenkov Detectors	Sovan Chakraborty	SERB	Physics	3090494
Precision studies for processes at present and future collider experiments	Meduri Chakravartula Kumar	DST	Physics	3016992
Exploring Hybrid Circuit QED Systems for Quantum Technology	Amarendra Kumar Sarma	MOES	Physics	5479000
Antiferromagnets with collinear and non-collinear spin textures for the future spintronics device applications.	Binoy Krishna Hazra	DST	Physics	700000
Non-collinear antiferromagnets for spintronics-based data storage devices	Binoy Krishna Hazra	IIT Guwahati	Physics	500000
Automated Stacking of Van der Waals Materials: Photonics in flatland	Rishi Maiti	IIT Guwahati	Physics	500000
Thin film growth of Quantum Materials for spintronics, optoelectronics, and quantum computing applications	Malleswararao Tangi	IIT Guwahati	Physics	500000
Synthesis of color-tunable, highly stable, and luminescent metal halide perovskite nanocrystals for fabrication of color-converting single-layer WLEDs and efficient metal ion detection in water	Saikat Bhaumik	IIT Guwahati	Physics	2000000
Integrated Quantum Photonics in Diamond	Vibhav Bharadwaj Shivakumar	IIT Guwahati	Physics	500000

Strategies to enhance the Impact of Suvidha scheme under Pradhan Mantri JanAushadhi Program (PMPJP)	Priyank Sinha	ICSSR	School of Business	1343750
Understanding knowledge hiding behavior from a victim precipitation approach	Abraham Cyril Issac	IIT Guwahati	School of Business	500000
Antecedents of green consumption in emerging economies: A mixed method approach	Kuldeep Baishya	IIT Guwahati	School of Business	500000
Designing Efficient Green Supply Chain Finance Instruments for Indian MSME's	Priyank Sinha	IIT Guwahati	School of Business	500000
Experimental study on cyclic horizontal force-displacement characteristics of prototype U-FREIs with and without rotation	Sajal Kanti Deb	APWD	Civil Engineering	2833600
Development of a novel local rehabilitation technique for corroded steel-reinforced concrete structures	Oinam Romanbabu Meetei	OTHER	Civil Engineering	1100000
ROAD SURFACE QUALITY ASSESSMENT OF SELECTED BORDER ROADS SECTIONS OF INDIA THROUGH ADVANCED REMOTE SENSING TECHNIQUE	Rishikesh Bharti	DTRL	Civil Engineering	5902028
A Real time 2D flood inundation forecasting system for the Brahmaputra River basin using Hydrologic- Hydro dynamic and statistical dynamical approaches	Rajib Kumar Bhattacharjya	IITM	Civil Engineering	2700448
Hydrological experiment and river discharge modeling for SWOT and Sentinel-3A/B missions: Brahmaputra River	Subashisa Dutta	ISRO	Civil Engineering	1128000
Development of Jute Clay Liners (JCL) for Waste Containment Applications	Tadikonda Venkata Bharat		Civil Engineering	2228300
Development of Intensity Duration Frequency Curves for North East India Incorporating Climate Change	Sreeja Pekkat	Ministry of Earth Sciences	Civil Engineering	3159720
Quantification of subsoil response of Birpur, Basopatti and adjacent regions of Madhubani, Bihar located adjacent to	Abhishek Kumar	Ministry of Earth Sciences	Civil Engineering	6236440

central seismic gap towards minimizing future earthquake induced damages				
DESIGN OF AN AUTOMATIC COMMUNICATION SYSTEM THROUGH CLOUD COMPUTING USING SENSOR BASED AUTOMATED INPUT FOR EFFICIENT OPERATION OF RANGANADI HEP WITH DUE EMPHASIS ON DOWNSTREAM CONCERNS UPTO CONFLUENCE WITH SUBANSIRI RIVER	Arup Kumar Sarma	NEEPCO	Civil Engineering	6193824
Material Resource Mapping for Sustainable PMGSY Road Network	Anjan Kumar Siddagangaiah	NRRDA	Civil Engineering	3380000
Performance Assessment of Cell Filled Concrete Pavements	Anjan Kumar Siddagangaiah	NRRDA	Civil Engineering	3806000
Performance Evaluation of the Roads Constructed under PMGSY using New Technologies	Anjan Kumar Siddagangaiah	NRRDA	Civil Engineering	2739000
Performance evaluation of Water hyacinth as an alternate geotextile material	Anil Kumar Mishra	Min. of Textiles (UNDP)	Civil Engineering	2114800
Health Impacts of Exposure to Particulate Pollution from High-sulfur Coal Mines located in Assam of Northeast India	Sharad Bhaurao Gokhale	SERB	Civil Engineering	5032500
Impact and Suitability of Electric Vehicles to Indian Roads	Akhilesh Kumar Maurya	DST	Civil Engineering	1796125
Evaluation of Column-to-Beam Flexural Capacity Ratio for Strong-Column Weak-Beam Design in RC Buildings	Hemant B. Kaushik	SERB	Civil Engineering	4048264
Attenuation Ability of Municipal Solid Waste Landfill Liners for Viral Pathogens	Tadikonda Venkata Bharat	SERB	Civil Engineering	4800000
Development and performance evaluation of Ready mix thermal insulation foam plasters for energy efficient structures	Indu Siva Ranjani Gandhi	SERB	Civil Engineering	3619217

Understanding the anatomy of an aseismically creeping fault?A case study from the Churachandpur-Mao fault in the Indo-Burma Wedge	Sayantan Chakraborty	SERB	Civil Engineering	3300000
A Pilot-scale comparative study on dumping of fresh and partially stabilized MSW followed by pretreatment of landfill leachates by conventional and electrocoagulation methods followed by upflow anaerobic filter	Ajay Kalamdhad	DST	Civil Engineering	9352886
Geopolymerization of fine fraction obtained from biomining of legacy waste from old MSW dumpsite	Anil Kumar Mishra	DST	Civil Engineering	2038167
Investigation of Pedestrian Distracted Behavior on Different Traffic Facilities	RB SHARMILA	IIT Guwahati	Civil Engineering	500000
Design of cold-formed steel gapped built-up columns	Abhishek Verma	IIT Guwahati	Civil Engineering	500000
Development of miniature split-Hopkinson pressure bar facility for contact behaviour of sand particles	Vivek Padmanabha	IIT Guwahati	Civil Engineering	500000
Technologies for Underwater exploration: Technology Innovation Hub under National Mission on Interdisciplinary Cyber-Physical Systems	Santosh Kumar Dwivedy	DST	Mechanical Engineering	72500000
Aerodynamics and thrust generation of two pitching plates for the design of high-performance micro-air-vehicle	Arnab Kr. De	SERB	Mechanical Engineering	1000000
Motor Imagery BCI for Neuroprostheses and Robotic Neurorehabilitation	Shyamanta Moni Hazarika	IIT Delhi	Mechanical Engineering	2815000
Intelligent Wearable Hand Exoskeleton for Robotic Neurorehabilitation	Shyamanta Moni Hazarika	INAE	Mechanical Engineering	5700000
Setting up Center of Excellence (CoE) in Sustainable & Innovative Design and Manufacturing of Polymer Toys	Shrikrishna Nandkishor Joshi	CHEMICAL & PETROCHEMICALS	Mechanical Engineering	50000000
Experimental Investigations on Flow Boiling Instabilities in Mini- and Microchannels	Manmohan Pandey	SERB	Mechanical Engineering	7443260
DEVELOPMENT OF LOW-COST PORTABLE DEVICE FOR PUDAM/ PUTA-Traditional Medicine Manufacturing	Senthilvelan Selvaraj	DST	Mechanical Engineering	3433760

A personalized visual guidance system for musculoskeletal therapeutic interventions	Subramani Kanagaraj	SERB	Mechanical Engineering	252000
Development of a viscoelastic quasi-zero-stiffness mechanism using graphite particles/graphene filled rubber composites for low-frequency vibration isolation	Satyajit Panda	SERB	Mechanical Engineering	2326764
Experimental and Numerical Appraisal of Heat Transfer Enhancement and Deterioration in Double-cooled Supercritical Forced-flow Channels	Amaresh Dalal	SERB	Mechanical Engineering	6842264
Hybrid cooling system design for Li-ion battery pack systems	Amaresh Dalal	SERB	Mechanical Engineering	660000
Design and Development of Smart Morphing Wing based on Shape Memory Alloy Actuators	Atanu Banerjee	SERB	Mechanical Engineering	4092264
Development of a numerical model and the stability analysis of dynamic keyhole in deep penetration laser welding process using the phase-field method	Swarup Bag	SERB	Mechanical Engineering	660000
Development of multi-material wire arc additive manufacturing process including the effect of multi-physics problem of droplet interaction, metallurgical model and free surface profile using phase field method	Swarup Bag	SERB	Mechanical Engineering	4961260
Assessment of Stability, Accuracy and Convergence of An Immersed Boundary Lattice Boltzmann Solver for Moving Boundary Problems	Dipankar Narayan Basu	SERB	Mechanical Engineering	660000
Functionality Enhancement through Design and Development of Advanced Finite Element Algorithms for STRTOOLS	Sachin Singh Gautam	SERB	Mechanical Engineering	6610692
Three-Dimensional Large Deformation Isogeometric Impact and Self-contact Using Varying-Order NURBS Discretization Approach	Sachin Singh Gautam	SERB	Mechanical Engineering	2975764

Fabrication, characterization and experimental investigation of functionally graded piezo-electric components.	Poonam Kumari	SERB	Mechanical Engineering	4870800
Design and development of a bio-inspired hip protector for elderly people made of shear thickening fluid filled 3D-printed metamaterial	Prasenjit Khanikar	SERB	Mechanical Engineering	4526764
Development and leveraging small-scale fluidic Platform towards understanding the plant root system: A Convergence of Engineering and Biology	Pranab Kumar Mondal	DST	Mechanical Engineering	6887657
Biomimetic Grasp Analysis in Multi-Fingered Robotic Hands as Bilinear Matrix Inequality Problems	Shyamanta Moni Hazarika	SERB	Mechanical Engineering	660000
Collective dynamics of self-propelled droplets in complex microfluidic environments	Shubhadeep Mandal	SERB	Mechanical Engineering	4022355
Low-Cost Scalable Manufacturing of High-Aspect Ratio Microneedles for Minimally Invasive Transdermal Drug Delivery Applications	Rinku Kumar Mittal	SERB	Mechanical Engineering	3304240
School of Innovations in Biomedical Devices and Systems and Inter-institutional Biodesign Center (SIBDS-IIBC)	Subramani Kanagaraj	DBT	Mechanical Engineering	30000000
Multi-Axis Multi-Material Wire Arc Additive Manufacturing	Sajan Kapil	DST	Mechanical Engineering	13252270
Sustainable Earthquake Resistant 3D-Printed Concrete Housing From Laboratory Testing to Industrial Application	Biranchi Narayan Panda	DST	Mechanical Engineering	2441996
Development of a Higher Order Nonlinear MDOF Stability Model for a 5-Axis High-Speed Micromilling of Difficult-to-Cut Materials	Rinku Kumar Mittal	DST	Mechanical Engineering	3316102
FIST 2018: Mechanical Engineering Department	HOD Mechanical	DST	Mechanical Engineering	57000000

Design and Development of a Micro-Cladding based Metal 3D Printer	Sajan Kapil	IIT Guwahati	Mechanical Engineering	1000000
A Multisensor Chatter Prediction Approach in the Milling Process using Artificial Intelligence	Rinku Kumar Mittal	IIT Guwahati	Mechanical Engineering	900000
A Chatter Prediction Approach in the Milling Process using Machine Learning Algorithms	Rinku Kumar Mittal	IIT Guwahati	Mechanical Engineering	1100000
Investigating the dynamics of benign termination of relativistic runaway electron beams in tokamak experiments	Vinodh Kumar Bandaru	IIT Guwahati	Mechanical Engineering	500000
Green Reinforcements: Developing Sustainable Biocomposites for Interior Applications	Ujendra Kumar Komal	IIT Guwahati	Mechanical Engineering	500000
Mathematical Homogenization and Local Field Statistics in a Thermoelastic Composite with Unidirectional Fibers	Tarkes Dora Pallicity	IIT Guwahati	Mechanical Engineering	500000

### Completed Sponsored Projects: 110

Project Title	PI Name	Funding Agency	Dept	Sanctioned Amount
Design of IoT Trans-receiver integrated with compact MIMO/Diversity antenna scheme	Mahima Arrawatia	DST	Electronics and Electrical Engineering	2592000
Formal Methods for Modeling and Verification of Intrusion Detection System in Wireless Networks.	Chandan Karfa	DST	Computer Science and Engineering	2674400
RISK ASSESSMENT OF FLOATING DEBRIS DOMINATED FLASH FLOODS IN TRANS-BOUNDARY UPPER HIMALAYAN CATCHMENTS	Rishikesh Bharti	DTRL	Civil Engineering	13495020
"Greenhouse gas emission, mitigation & adaptation: strategies for better inventory and management of such gases in rice ecosystems of two agro-climatic zones of Assam	Sudip Mitra	DBT	School of Agro and Rural Technology	5471856
Design and Synthesis of Freestanding Ion-Selective Membranes from Peptide Modified Two-Dimensional Nanomaterials	Kalyan Raidongia	CSIR	Chemistry	800000



Assessment of Recycled Materials Interaction and its Effect on Durability of Cold Bituminous Mixes	Anjan Kumar Siddagangaiah	SERB	Civil Engineering	2836022
Security Analysis of Compiler Optimization Techniques	Chandan Karfa	SERB	Computer Science and Engineering	2211264
Electroencephalographic Characterization of Post-Stroke Motor Imagery Induced Mental Fatigue for Adaptive Neurorehabilitation	Shyamanta Moni Hazarika	DST	Mechanical Engineering	4774600
Towards scalable quantum computer using Yb atoms in an optical lattice	Kanhaiya Pandey	DST	Physics	29082000
Development of an Integrated Water Treatment and fuel Production System using Ceramic Membranes and Microchannel Reactors.	Selvaraju Narayanasamy	DST	Biosciences and Bioengineering	6891752
Functionalization of sulfoximines and related compounds based on nitrogen-centred radical chemistry.	Bhisma Kumar Patel	SERB	Chemistry	1830000
Water Filtration, Advanced-oxidation and Capacitive-deionisation Treatments for Removal of Emerging Contaminants in Water. Acronym: (Water-FACTs)	Selvaraju Narayanasamy	DST	Biosciences and Bioengineering	4304164
Variational Calculus Method for Solving Microflows in a Rotating Platform	Pranab Kumar Mondal	DST	Mechanical Engineering	660000
Stochastic Games for Continuous-time Stochastic Processes	Subhamay Saha	SERB	Mathematics	660000
Fabrication of Electrical Actuators with Special Wettability Surfaces for Efficient Handling of Micro/Nano Droplets	Kalyan Raidongia	SERB	Chemistry	2772000
Connecting Navier-Stokes equation with dynamical equations in gravity: a new perspective	Bibhas Ranjan Majhi	SERB	Physics	2126894
Technology Development & Innovation Engineering for Value Chain Development for Citrus Fruits of North East Region	Siddhartha Singha	DBT	School of Agro and Rural Technology	4250240
Understanding the regulations of RNPS1 by miRNAs and RNA-Binding Proteins under ER stress	Kusum Kumari Singh	DBT	Biosciences and Bioengineering	4866956

Design and Development of a Bulk Material Handling Device for Metering, Mixing, and Delivery of Powder Feedstock	Sajan Kapil	DST	Mechanical Engineering	5275240
Design and development of an intelligent extrusion device for 3D printing of concrete structures	Biranchi Narayan Panda	DST	Mechanical Engineering	4344222
Development of Configurable Digital Holographic Microscope for Microfluidics Applications	Rishikesh Dilip Kulkarni	SERB	Electronics and Electrical Engineering	5270034
Development of hybrid CPU/GPU direct simulation Monte Carlo with dynamic load balancing schemes for hypersonic flow applications	Tapan Krishnakumar Mankodi	DST	Mechanical Engineering	1280000
iDT-NaPaMeGs: Inverse design tool for nanoparticle meta-grid based photonic devices using computational electromagnetics and deep learning	Debabrata Sikdar	DST	Electronics and Electrical Engineering	1950040
Enhancement of the Chemotherapeutic Potential of Anticancer Drugs: Biothiol-stimulated Fluorogenic Strategies for Adjuvant Delivery of Anticancer drug and GSTP1 inhibitor	Krishna Pada Bhabak	ICMR	Chemistry	1046500
Fall Risk warning system for Elderly by gait analysis using wearable insole-based pressure sensors and integrated IOT	Harsh Chaturvedi	DST	School of Energy Sciences and Engineering	6417410
Tunable Mechanical properties of Architected Metamaterial Enabled via Multi-Material Additive Manufacturing	Biranchi Narayan Panda	SERB	Mechanical Engineering	2373000
On feedback controllers for LQR control of multi-input index-1 DAE systems	Chayan Bhawal	SERB	Electronics and Electrical Engineering	682000
Development of liquid crystal based microfluidic device for particle manipulation	Shubhadeep Mandal	SERB	Mechanical Engineering	3127080
Machine learning augmented minimum miscibility pressure (MMP) prediction for CO <sub>2</sub> -EOR	Sumit Kumar	IIT Guwahati	Chemical Engineering	500000
Development of hybrid higher-order continuum-rarefied computational framework for space propulsion applications	Tapan Krishnakumar Mankodi	SERB	Mechanical Engineering	969370
AI and IoT based Attack Detection and Authentication Scheme for Cyber Security in Grid Connected Power Electronic Converters	Manas Khatua	CPRI	Computer Science and Engineering	1777732

Circular Economy Solution for Microplastics: Indo-Finnish Scientific Collaboration	Sudip Mitra	Finland	Centre for Disaster Management and Research	89250
Interface Engineered Sulfur Cathodes and Lithium Metal Anodes with Heterostructured Host for Safer Lithium-sulfur batteries	Ranjith Thangavel	TATA STEEL, Jamshedpur	School of Energy Sciences and Engineering	154216.63
Centre for Technological Excellence in Water Purification (CTEWP)	Mihir Kumar Purkait	DST	Chemical Engineering	9993000
Metal hydride materials and systems for the increase of efficiency in renewable and hydrogen energy	P. Muthukumar	DST	School of Energy Science and Engineering	3516400
Archiving, Modelling and Visualization of the Eco-Cultural Heritage of the Majuli River Island of Assam	Sukumar Nandi	DST	Centre for Linguistics Science and Technology	4950000
Development of Novel Deep Eutectic Solvents for the Extraction of Aromatics to Produce Food/Pharma Grade Hexane and Speciality Products Using COSMO-SAC Screening	Tamal Banerjee	HPCL GREEN	Chemical Engineering	2792790
Seismic Strengthening of Unreinforced Masonry Buildings using Ferrocement Bands	Hemant B. Kaushik	CSIR	Civil Engineering	1696000
Study of in?depth genetic heterogeneity with respect to resistome and compensatory adaptation of MDR Mtb clinical strains inside BM? Mesenchymal stem cells circulating in the North East Region	Sanjukta Patra	DBT	Biosciences and Bioengineering	6841000
Quality of Living: Smart Home Environment Creation through Automatic Monitoring and Utilization of the Physical and Cognitive State of the Residents	Sukumar Nandi	DEITY	Centre for Linguistics Science and Technology	11030000
Study of Glacial Dynamics and Sustainable Hydrological Resources in Arunachal Himalaya	Chandan Mahanta	DST	Civil Engineering	26923690
CUMULATIVE IMPACT ASSESSMENT FOR CASCADING INTERVENTIONS IN HIMALAYAN RIVERS (CI2HR)	Subashisa Dutta	Ministry of Environment, Forest and Climate Change, GOI	Civil Engineering	24501040

Design and synthesis of new light harvesting chromophores and studying their photophysical properties	Parameswar K Iyer	SERB	Chemistry	3036000
Combinatorial approach for enhancing surface oxidation and reduction kinetics for value added products from renewable sources	Mohammad Qureshi	DST	Chemistry	3637788
BIOCATALYTIC DESULPHURIZATION OF CRUDE OIL BY HIGH PERFORMING GENETICALLY ENGINEERED MICROORGANISMS	Vijayanand S. Moholkar	CSIR	School of Energy Science and Engineering	1800000
Proof checking of Detailed Design and drawings of structural works from Titurmir Station (Pier 760) to Airport station (excluding) of New Garia-Airport Metro line-Kolkata	Anjan Dutta	RVNL	Civil Engineering	19153840
Synthesis of Cobalt -Nitrosyl Complexes having {Co(NO)} <sub>9</sub> Configuration as a Source of Nitroxyl/HNO	Biplab Mondal	SERB	Chemistry	4356000
Tandem Ring-Opening Cyclization/Cycloaddition of Small Ring Heterocycles with Nucleophiles for the Assembly of Medicinally Important Heterocycles	Tharmalingam Punniyamurthy	SERB	Chemistry	335000
Teachers Associateship for Research Excellence (TARE)	Poulose Poulose	SERB	Physics	1005000
A Study of Selmer Groups of Elliptic Curves and Their Applications	Anupam Saikia	SERB	Mathematics	660000
Development of diagnostic Kits for quick detection of CTV, HLB and Phytophthora rot diseases in Citrus of North East India	Lingaraj Sahoo	DBT	Biosciences and Bioengineering	6135440
Development of signal and channel models, circuits, and antennas for next generation Wireless systems with emphasis on vehicular communication		MIETY	Electronics and Electrical Engineering	47496000
Theoretical insight into the structure and functioning of Defensin family of proteins: An all-atom Molecular Dynamics simulation study	Sandip Paul	DBT	Chemistry	2650000
Origami-inspired metamaterial composite orthotic insole for foot disorders	Subramani Kanagaraj	TATA STEEL, Jamshedpur	Mechanical Engineering	120000

Investigating Enzymatic reactions in Crowded Physiological spaces AND Structural changes in SARS-Cov-2 S protein in response to Drug	Rajaram Swaminathan	DST	Biosciences and Bioengineering	1500000
Design and Development of Robotic Vaccinator for mass vaccination	Subramani Kanagaraj	OTHER	Mechanical Engineering	360660
Empowering women through Appropriate technology intervention in weaving sector for Productivity enhancement and drudgery reduction of artisans	Sashindra Kumar Kakoty	DSIR	School of Agri and Rural Technology	3729756
Technology development of vinegar production from indigenous fruits Leteku (Baccaurea motleyana), Kordoi (Averrhoa carambola), Poniyal (Flacourtia jangomas) of Assam	Utpal Bora	ASTEC	Center for the Environment	616000
Investigation on doping in 2D topological insulators Bi <sub>2</sub> Se <sub>3</sub> , Bi <sub>2</sub> Te <sub>3</sub> , Sb <sub>2</sub> Te <sub>3</sub> nanosheets for optoelectronic applications	Pravat Kumar Giri	U G C	Physics	45000
Integrated Track in Brain and Cognitive Sciences/ IBRAIN	Bidisha Som	EUROPEAN EDUCATION AND CULTURE EXECUTIVE AGENCY	Humanities and Social Sciences	4545679.3
National Centre of Clean Coal Research and Development	Amaresh Dalal	DST	Mechanical Engineering	3370000
Development of Biodegradable Polymer based Controlled Release Fertilizers and Pesticides for Sustainable Agro-economy ?BioPolyCRF?	Vimal Katiyar	DBT	Chemical Engineering	5172996
DEVELOPMENT OF MINIMAL INVASIVE NOVEL INJECTABLE HYDROGEL AND NANO-CARRIER - HYBRID SYSTEM FOR LOCALIZED TARGETED CANCER THERAPY	Biman Behari Mandal	ICHR	Biosciences and Bioengineering	4722356
Game Theory based Intrusion Detection System (IDS) for Cyber Physical System.	Sushanta Karmakar	DST	Computer Science and Engineering	30.601

NRL-Centre of Excellence on Sustainable Materials [NRL-COE-SUSMAT] for Development of Biodegradable Plastics from Oil and Bio-Refinery Streams	Vimal Katiyar	Numaligarh Refinery, PSU	Chemical Engineering	40000000
Combined Catalytic Reforming and Upgrading Technique for Production of Biofuels in Circulating Fluidized Bed Reactor	Nanda Kishore	SERB	Chemical Engineering	3630000
Survey of Morbidity and Mortality Rates among Tea Garden Workers of Assam	Rajshree Bedamatta	Directorate of Economics and Statistics, Government of Assam	Humanities and Social Sciences	3138000
Development of non-edible green vegetable oil as a potential liquid dielectric for power/distribution transformer from the renewable source.	Sisir Kumar Nayak	SERB	Electronics and Electrical Engineering	6870461
Chemical and Structural Intricacies in the Formation, Stability and Reactivity of Metal-Oxygen Adducts in Non-Heme Synthetic Scaffolds	Chivukula Vasudeva Sastri	SERB	Chemistry	4782230
Dynamics and Control of Two and Three-dimensional Excitation Waves	Sumana Dutta	SERB	Chemistry	7719154
Functional Mechanism of CRISPR RNA Maturation in an Atypical CRISPR-Cas Adaptive Immune System	Anand Baskaran	SERB	Biosciences and Bioengineering	7448760
Process Analytical Technology (PAT) control tools for high cell density cultivation of glycoengineered Pichia pastoris for Human Interferon Alpha 2b production	Senthilkumar Sivaprakasam	SERB	Biosciences and Bioengineering	4301264
Design and development of a simple cost-effective table-top multi-axis CNC machine tool configuration using parallel kinematics	Shrikrishna Nandkishor Joshi	SERB	Mechanical Engineering	3534764
Injectable bioresorbable silk hydrogel system for localized breast cancer therapy and post-lumpectomy reconstruction.	Biman Behari Mandal	SERB	Biosciences and Bioengineering	4691240

Designing incentives to improve tuberculosis treatment adherence in resource constrained settings	Keyur Babulal Sorathia	NUS-Global Asia Institute NIHA Research Grant 2018	Design	12255000
SMART CONTACTLESS TECHNOLOGY DEVELOPMENT FOR SMART FENCING	Gaurav Trivedi	DST-DAAD	Electronics and Electrical Engineering	3241141
Intelligent Disturbance Observer based Adaptive Control of DC-DC Power Converter for Nonlinear Loads	Praveen Kumar	DST	Electronics and Electrical Engineering	3204000
Review Comments on the Inception Report for Third Party Audit of NF Railway Bridge No: 394	Arunasis Chakraborty	RITES Ltd.	Civil Engineering	590000
The non-canonical estrogen receptor repertoire in breast cancer: towards refined disease classification and therapeutic decision	Anil Mukund Limaye	ICMR	Biosciences and Bioengineering	2460966
Role of Trigger factor in caseinolytic protease system of Leptospira	Manish Kumar	DST	Biosciences and Bioengineering	5624605
Study of ejection mechanism from magnetized accretion disk around rotating black holes	Santabrata Das	SERB	Physics	660000
Dynamically tunable resonances in terahertz metamaterials using 2-D materials.	Gagan Kumar	SERB	Physics	7436000
Development of a reduced-basis numerical continuation method	Satyajit Panda	SERB	Mechanical Engineering	660000
Study on the bioactive compounds of five ethno-medicinal plants of Assam	Vibin Ramakrishnan	SERB	Biosciences and Bioengineering	335000
Probing the effect of strong gravity around the black hole X-ray binaries through AstroSat observations	Santabrata Das	ISRO	Physics	1808480
Metamaterials based Compact Broadband Tunable Modulator for Terahertz Photonics	Gagan Kumar	DEITY	Physics	7339640
An Advanced Predictive Maintenance Tool for Equipment and Machines Using Industry 4.0 Concepts	Deepak Sharma	SERB	Mechanical Engineering	2739264

Use of non-toxic nanoformulations for prolonging shelf life and reduction of post-harvest loss of Khasi mandarin orange ( <i>Citrus reticulata</i> ) of North East India	Vimal Katiyar	DBT	Chemical Engineering	9023200
Understanding the cross talk between the host and the pathogen: A way to identify the novel biomarker for the diagnosis of Japanese encephalitis virus infection	Sachin Kumar	ICMR	Biosciences and Bioengineering	7200000
Vortex-induced vibrations of a rotating sphere close to a solid wall	Arnab Kr. De	DST	Mechanical Engineering	1350000
Investigations into estrogen receptor modulatory activities of Karanjin, a furanoflavonol from <i>Pongamia pinnata</i>	Anil Mukund Limaye	DST	Biosciences and Bioengineering	2709344
Modelling of indigenous diagnostics and immuno-potent vaccine candidates to combat African swine fever in India	Sachin Kumar	DBT	Biosciences and Bioengineering	8253040
Development and testing of a wearable device for the early detection of a cartilage damage in a knee stepping towards an osteoarthritis condition using acoustic emission	Poonam Kumari	DST-DAAD	Mechanical Engineering	2976738
Unravelling the Regulatory Mechanism that Connects Ribosome Biogenesis and Stringent Response with Bacterial Cell Growth	Anand Baskaran	Ignite Life Science Foundation	Biosciences and Bioengineering	4180022
Shastri Covid-19 Pandemic Response Grant (SCPRG): Call for Innovative Solutions	Lalit Mohan Pandey	CPRI	Biosciences and Bioengineering	841930
Support for transboundary hydro diplomacy course	Anamika Barua	NGO	Humanities and Social Sciences	480700
"Engineered land: terrestrial imaginaries and realities"	Anamika Barua	Wageningen University, the Netherlands	Humanities and Social Sciences	251892



Study on the effect of H <sub>2</sub> blending in Natural Gas	Senthilmurugan Subbiah	OIL India Ltd	School of Energy Sciences and Engineering	12839223
Temperature dependent Micro-Raman Spectroscopy of MnTa <sub>2</sub> O <sub>6</sub> and Mn <sub>4</sub> Nb <sub>2</sub> O <sub>9</sub> systems.	Subhash Thota	DAE	Physics	45000
Biopolymer based cultivation of mushroom, shelf-life enhancement of vegetables (tomato, capsicum, cucumber, mushroom) fruits (khashi mandarin, strawberry) and residual utilization as biofertilizer and Green-compost	Vimal Katiyar	DBT	Centre for Sustainable Polymers	6475000
Synthesis of therapeutically beneficial peptides with expanded genetic codes via a cell-free translation based approach.	Subhendu Sekhar Bag	SERB	Chemistry	150000
DNA Aptasensor-Nanomaterial based product development and commercialization for application in Diagnostics and Environment Monitoring	Dipankar Bandypadhyay	DBT	School of Health Science and Technology	2988038
Techno-Economic study - Removal of CO <sub>2</sub> & N <sub>2</sub> from Natural gas produced from Dandewala field of OIL Rajasthan	Senthilmurugan Subbiah	OIL India Ltd	Chemical Engineering	7966427
Distilling Science, Engineering and Technological Knowledge from ancient literature of Mahapuranas	Lalit Mohan Pandey	AICTE	Centre for Indian Knowledge Systems	375000
Development of Wireless Power Transmission System (WPTS) for powering insect scale Micro Air Vehicle (MAV)	Sisir Kumar Nayak	DRDO	School of Energy Sciences and Engineering	992376
3rd meeting of the reconstituted expert committee (EC) under CCP Division	Anamika Barua	DST	Humanities and Social Sciences	463644
Memorandum of Understanding between the Mehta Family Foundation and IIT Guwahati for the establishment of the Mehta Family School of Data Science and Artificial Intelligence and the Jyoti and Bhupat Mehta School of Health Sciences and Technology		Mehta Family Foundation	School of Health Science and Technology	8200000
Construction and Application of Ancient Indian Astronomical Yantras: Documentation and Training	Tadikonda Venkata Bharat	Ministry of Education	Centre for Indian Knowledge Systems	1250000

Investigation of Solid Flow in an Elevated Temperature Fluidized Bed with Decomposing and Non-Decomposing Liquid Injection through Side Wall Pneumatic Nozzles	Pankaj Tiwari	BRNS	Chemical Engineering	3227100
A Rapid Assessment of the Orunodoi Scheme	Rajshree Bedamatta	UNICEF Assam	Humanities and Social Sciences	1005000

**PART IV**

Status Report related to Special Recruitment Drive  
Administrative and Technical Staffs (Group A)  
Progress of Construction Work  
Summary of Institute Accounts



**STATUS REPORT RELATED TO SPECIAL RECRUITMENT DRIVE  
UNDER MISSION MODE 2023-24**

The Ministry of Education vide its letter under reference D.O. No. 33-2/2021-TS-III (Pt.I) dated 24.08.2021, advised to clear the backlog by filling the vacancies in a Mission Mode within a period of one year starting from 05.09.2021 to 04.09.2022, which was placed in the 108<sup>th</sup> meeting of the BOG with a status report. The Ministry also advised to include a separate chapter in the Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format during the year.

IIT Guwahati has started conducting the interviews under the Special Recruitment Drive (SRD) / Mission Mode Recruitment (MMR) for vacancies in positions against all categories as per Ministry Directives and trying to complete the said drives by December 2023. Interviews against pending Regular Recruitment (RR) were also conducted along with SRD / MMR. It may be noted that the Institute had also taken care of the reserved candidates in its regular recruitment process.

The current status of overall vacancy positions in respect of IIT Guwahati is furnished as below:

**1. Faculty in Position/vacancy based on Sanctioned Faculty Strength = 696 (as of 05.09.2021, the start date of the period of special recruitment drive on Mission Mode)**

	GEN	SC	ST	OBC	EWS	PWD	Total
Faculty in position	372	16	2	13	-	03	406
Vacant position	117	44	22	78	29	4% Reservation will be applied horizontally	290

**2. Current Status of Faculty in Position / Vacancy based on Sanctioned Faculty Strength = 743**

		GEN	SC	ST	OBC-NCL	EWS	PWD	Total
Filled up in the RR/SRD/MMR (since 05.09.2021)	Internal	54	4	0	2	0	0	60*
	External	51	8	3	9	1	2	72
Superannuated / Released (since 05.09.2021)		19	2	0	0	0	1	22

Faculty in position (as of 05.09.2024)	416	22	5	11	1	4	455
Vacant position (as of 05.09.2024)	116	43	22	78	29	4% Reservation will be applied horizontally	288
*60 Candidates appointed are internal candidates, as such, this number doesn't change the total vacancy positions.							

**Additional Information:**

1.	Any other information	<ul style="list-style-type: none"> <li>• Efforts are made to appoint candidates belonging to reserved categories. However, a sufficient number of meritorious candidates were not available in such categories and IIT Guwahati does not want to compromise on the merit/quality of the candidates.</li> <li>• Posts are vacant both in the unreserved as well as reserved categories. This is because of the shortage of good quality candidates in both the unreserved as well as the reserved categories, who aspire for teaching positions.</li> </ul>
2.	Preparation for reservation rosters in accordance with Central Educational Institutions (Reservation in Teachers' Cadre) Act-2019	The committee constituted for the same has already submitted its report for perusal and approval.

**ADMINISTRATIVE STAFFS (GROUP A)**

<b>Sl. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Dept./ Section</b>
1	Mr. Dibya Jyoti Goswami	Joint Registrar	F&A
2	Mr. Dilip Boro	Joint Registrar	Students' Affairs
3	Mr. Kuntal Bhuyan	Joint Registrar	Stores & Purchase
4	Mr. Dhruvajyoti Sharma	Joint Registrar	Administration
5	Mr. T Tongkhonun Haokip	Joint Registrar	Establishment
6	Mr. Prakash Hazarika	Joint Registrar	Administration (on deputation)
7	Mr. Gunamani Das	Deputy Registrar	EO-cum-SRC. Additional charge of Student Affairs
8	Mr. Labanu Kishore Konwar	Assistant Registrar	II&SI
9	Dr. Subhajit Choudhury	Assistant Registrar	Academic Affairs
10	Mr. Pranab Borgohain	Assistant Registrar	Legal & PIO
11	Mr. Sanjay Mandal	Assistant Registrar	PRBR
12	Ms. Monalisa Kakati	Assistant Registrar	Faculty Affairs
13	Ms. Nandeeta Das Salhotra	Assistant Registrar	AER
14	Ms. Amaya Phukan	Assistant Registrar	Director's Office
15	Mr. Kushal Ch. Das	Assistant Registrar	S&P
16	Mr. Dipon Lal Boishya	Assistant Registrar	Internal Audit
17	Mr. Dip Jyoti Dutta	Assistant Registrar	R&D
18	Mr. A. Wanshai Shynret	Assistant Registrar	Academic Affairs (On lien)
19	Ms. Nibha Devi	Assistant Registrar	Administrative
20	Mr. Jiban Ch. Barman	Assistant Registrar	Estb.
21	Mr. Ritu Porna Sarma	Assistant Registrar	Students' Affairs
22	Mr. Jiten Sarmah	Assistant Registrar	Finance & Accounts
23	Mr. Manash Jyoti Pathak	Assistant Registrar	R&D
24	Dr. Tamal Kr. Guha	Librarian	Central library
25	Dr. Sanjib Kr. Deka	Asst. Librarian	Central Library
26	Mr. Chandan Goswami	Assistant Librarian	Central Library
27	Mr. Yengkhom Lalen Singh	Seniority Security Officer	Security Section
28	Ms. Pallabita Barooah Chowdhury	Students' Counsellor	Student Affairs
29	Ms. Namrata Naomi Rynjah	Students' Counsellor	Student Affairs
30	Dr. Nesmita Das	Students' Counsellor	Student Affairs
31	Mr. Rakesh Kakati	Students' Counsellor	Student Affairs

**TECHNICAL STAFFS (GROUP A)**

<b>Sl. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Dept./ Section</b>
1	Dr. (Mrs.) Leena Barua	CMO(SAG)	Medical
2	Dr. Anuj Kr. Baruah	CMO(SAG)	Medical
3	Dr. Surojit Majumdar	Sr. Medical Officer	Medical
4	Dr. Pallabi Sarmah	Sr. Medical Officer	Medical
5	Dr. Palash Bortamuly	Medical Officer	Medical
6	Dr. Hitakalpa Baishya	Senior Medical Officer	Medical
7	Mr. Lallan Kumar G Singh	Superintending Engineer	IPM
8	Mr. Nirupam Roy	Additional Supdt. Engg.	IPM
9	Mr. Aditya Kr. Gogoi	Exe. Engineer	IPM
10	Mr. Srikanta Senapati	Exe. Engineer (Elect.)	IPM
11	Mr. Dibyajyoti Dutta	Exe. Eng. (Civil)	IPM
12	Mr. Nayan Kr. Sarma	Exe. Eng. (Civil)	IPM
13	Mr. Kumud Barman	Asst. Exe. Engineer (Elect.)	IPM
14	Mr. Bhaskar Choudhury	Asst. Exe. Eng. (Civil)	IPM
15	Mr. Amal Sarma	Assistant Executive Engineer	IPM
16	Mr. Jayanta Sarkar	Assistant Executive Engineer	IPM
17	Dr. Laxmi Narayan Sharma	Sr. Technical Officer	EEE
18	Dr. Sanjib Das	Sr. Technical Officer	JEE cell
19	Dr. Pallav Kr. Dutta	Sr. Technical Officer	Director's Office
20	Dr. Sidananda Sarma	Senior Technical Officer	Physics
21	Dr. Arun Ch. Borsaikia	Senior Technical Officer	CE
22	Dr. Lepakshi Barbora	Senior Technical Officer	SESE(Energy)
23	Mr. Chandan Borgohain	Technical Officer Gr. I	CIF
24	Dr. Babulal Das	Technical Officer Gr. I	Chemistry
25	Mr. Kaustubh Acharyya	Technical Officer Gr. I	Nanotechnology
26	Dr. Deepmoni Deka	Technical Officer Gr. I	Environment
27	Ms. Josephine S.	Technical Officer Gr. I	EEE
28	Mr. Sanjoy Das	Technical Officer Gr. I	CCC
29	Mr. Manab Mohan Borah	Technical Officer Gr. I	CCC
30	Dr. Kula Kamal Senapati	Technical Officer Gr. I	CIF
31	Ms. Jonali Saikia	Technical Officer Gr. I	CE
32	Dr. Rituraj Saikia	Technical Officer Gr. I	ME
33	Mr. Jishu Krishna Ghosh	Technical Officer Gr. I	CCC
34	Mr. Nanu Alan Kachari	Technical Officer Gr. I	CSE
35	Mr. Bhriguraj Borah	Technical Officer Gr. I	CSE
36	Mr. Pranjol Paul	Technical Officer Gr. I	ME



37	Dr. Madhuriya Pratim Das	Technical Officer Gr. I	EEE
38	Mr. Guna Kanta Saikia	Technical Officer Gr. I	CCC
39	Ms. Ritumoni Kalita	Technical Officer Gr. I	Chemical Engg.
40	Dr. Pranjoli Das	Technical Officer Gr. I	Nanotechnology
41	Mr. Iqbal Inam	Technical Officer Gr. I	PRBR
42	Md. Jeherul Islam	Technical Officer Gr. I	CCC
43	Mr. Harsaraj Biswanath	Technical Officer Gr. I	Chemical Engg.
44	Ms. Abhilasha Mohan Baruah	Technical Officer Gr. I	Chemistry
45	Dr. Dolly Gogoi	Technical Officer Gr. I	CIF
46	Mr. Debarshi Baruah	Technical Officer Gr. I	Energy
47	Mr. Dhruvajyoti Pathak	Technical Officer Gr. I	CCC
48	Mr. Kuldeep Kalita	Technical Officer Gr. II	CE
49	Mr. Samarjyoti Kalita	Technical Officer Gr. II	CE
50	Mr. Bishnu Tamuli	Technical Officer Gr. II	Design
51	Dr. Hitesh Sharma	Technical Officer Gr. II	Design
52	Mr. Pankaj Kumar	Technical Officer Gr.-II	Chemical Engg.
53	Mr. Basab Bijoy Purkayastha	Technical Officer Gr.-II	Physics
54	Mr. Aditya Kalita	Technical Officer Gr.-II	Physics
55	Mr. Paban Bujor Barua	Technical Officer Gr.-II	EEE
56	Mr. Gobinda Chhetry	Technical Officer Gr.-II	Nanotechnology
57	Ms. Sayanika Das	Technical Officer Gr.-II	Nanotechnology
58	Dr. Dhruvajyoti Bordoloi	Technical Officer Gr.-II	ME
59	Mr. Jyotirmoy Kakati	Technical Officer Gr.-II	ME
60	Mr. Deepjyoti Saikia	Technical Officer Gr.-II	CCC
61	Ms. Aparna Barik	Technical Officer Gr.-II	CCC
62	Ms. Lipika Nath	Technical Officer Gr.II	Chemistry
63	Mr. Utpal Kr. Sarma	Technical Officer Gr.II	EEE
64	Mr. Amal Kalita	Technical Officer Gr.II	ME
65	Dr. Lukumoni Borah	Technical Officer Gr.II	Chemical Engg.
66	Mr. Atul Ch. Deka	Technical Officer Gr.II	Physics
67	Mr. Naba Kr. Thakuria	Technical Officer Gr.II	CCC
68*	Mr. Romen Ch. Dutta	APEO	Gymkhana
69*	Dr. Diganta Saikia	APEO	Gymkhana
70*	Mr. Nandan Kanan Das	Workshop Superintendent	ME

## PROGRESS OF CONSTRUCTION WORKS

<b>STATUS OF CONSTRUCTION PROJECTS (Completed)</b>						
<b>Sl. No.</b>	<b>Project Title</b>	<b>Project Cost (Cr)</b>	<b>Date of Start of Project</b>	<b>Date of Completion</b>	<b>Physical Progress</b>	<b>Reason / Remarks</b>
1	160 units in (G+9) F-Type residential towers at IIT Guwahaticampus.	159.63	15.10.2018	30.09.2023	100 %	
2	Extension of academic complexphase VI-Centre for EducationTechnology Building.	38.22	24.04.2019	31.07.2023	100 %	
<b>STATUS OF ONGOING PROJECTS</b>						
<b>Sl. No.</b>	<b>Project Title</b>	<b>Project Cost (Cr)</b>	<b>Date of Start of Project</b>	<b>Date of Completion</b>	<b>Physical Progress</b>	<b>Reason / Remarks</b>
1	Construction of Biosciences & Bioengineering (BSBE) Building	45.00	25.03.2024	24.09.2026	10%	Delayed due to site hindrance.
2	Construction of 60-seater Hostel for International faculty and Students	15.00	24.12.2022	23.12.2024	60%	

3	Construction of building for CORE laboratory for first year students	15.00	24.12.2022	23.06.2024	50%	
4	Internal finishing works of Upper floors of Research Building, Classroom Complex & New SAC building.	10.51	12.09.2022	12.09.2023	100%	
5	Vertical Extension of ME Department building at IIT Guwahati.	11.00	01.11.2022	30.04.2024	90%	
6	Construction of EWS hostel (Gaurang).	45.00		31.05.2024	90%	
7	Augmentation of HVAC Plants in IITG Guwahati	2.68	-	31.10.2024	50%	

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
GUWAHATI - 781039, ASSAM

BALANCE SHEET AS AT 31ST MARCH 2024

[Amount in ₹]

SOURCES OF FUNDS	Schedule	Current Year	Previous Year
CORPUS/CAPITAL FUND	1	12,42,90,34,224	12,11,61,05,918
DESIGNATED/ EARMARKED / ENDOWMENT FUNDS	2	2,44,01,36,939	2,17,09,80,902
CURRENT LIABILITIES & PROVISIONS	3	9,01,60,85,139	8,15,77,05,735
TOTAL		23,88,52,56,302	22,44,47,92,555
APPLICATION OF FUNDS	Schedule	Current Year	Previous Year
FIXED ASSETS	4		
Tangible Assets		16,22,25,80,259	14,09,26,35,140
Intangible Assets		17,19,86,886	17,79,04,976
Capital Works-In-Progress		32,31,25,922	1,58,96,10,985
INVESTMENTS FROM EARMARKED / ENDOWMENT FUNDS	5		
Long Term		1,09,72,74,092	1,10,41,87,228
Short Term		0	0
INVESTMENTS - OTHERS	6	1,25,12,26,310	60,98,17,037
CURRENT ASSETS	7	4,04,64,18,989	3,95,83,22,007
LOANS, ADVANCES & DEPOSITS	8	77,26,43,844	91,23,15,184
TOTAL		23,88,52,56,302	22,44,47,92,555

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Registrar

Director

Guwahati; June 27, 2024

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
GUWAHATI - 781039, ASSAM

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2024

Particulars	Schedule	[Amount in ₹]	
		Current Year	Previous Year
<b>INCOME</b>			
Academic Receipts	9	63,51,22,095	62,69,42,790
Grants / Subsidies	10	4,57,01,96,116	3,98,73,42,047
Income from investments	11	12,89,84,163	8,25,79,923
Interest earned	12	7,84,22,565	4,17,51,881
Other Income	13	13,55,27,608	10,68,75,356
Prior Period Income	14	14,14,799	33,51,557
<b>TOTAL (A)</b>		<b>5,54,96,67,345</b>	<b>4,84,88,43,554</b>
<b>EXPENDITURE</b>			
Staff Payments & Benefits (Establishment expenses)	15	2,94,02,13,914	2,68,86,97,089
Academic Expenses	16	1,06,13,74,406	80,91,16,152
Administrative and General Expenses	17	45,47,07,882	46,27,69,496
Transportation Expenses	18	1,90,63,374	1,93,55,311
Repairs & Maintenance	19	39,96,11,850	31,96,74,899
Finance costs	20	7,92,40,362	5,72,70,336
Depreciation	4	90,07,44,139	82,15,51,162
Other Expenses	21	0	0
Prior Period Expenses	22	18,31,21,179	14,16,10,023
<b>TOTAL (B)</b>		<b>6,03,80,77,106</b>	<b>5,32,00,44,468</b>
<b>Balance being excess of Income over Expenditure (A-B)</b>		<b>(48,84,09,761)</b>	<b>-47,12,00,914</b>
Add : Transfer Corpus/Capital for equivalent amount of Depreciation on Assets Purchased from Capital Grant/ Projects/ transfer of ownership/earmarked et		90,07,44,139	82,15,51,162.09
Transfer to / from Designated Fund			
Earmarked / Endowment Funds		(21,41,10,207)	-13,52,08,437
Less: Excess of Capital Expenditure			-2,06,71,943
Less Amount Transferred to HEFA		(38,79,94,700)	-30,31,03,875
<b>Balance Being Surplus / (Deficit) Carried to Capital Fund</b>		<b>(18,97,70,528)</b>	<b>-10,86,34,007</b>

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Joint Registrar (F&A)

Registrar

Director

Guwahati; June 27, 2024

INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
GUWAHATI - 781039, ASSAM

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2024

[Amount in ₹]

RECEIPTS		Current Year	Previous Year	PAYMENTS		Current Year	Previous Year
I.	Opening Balance			I.	Expenses		
	a) Cash Balances	3,19,000	3,13,000		a) Establishment Expenses	2,31,35,38,085	2,16,78,96,742
	b) Bank Balance				b) Academic Expenses	91,97,67,535	71,29,09,463
	i. In Current accounts	97,34,18,376	73,78,24,970		c) Administrative Expenses	79,28,611	2,58,88,252
	ii. In Savings accounts	2,96,45,96,714	2,70,01,05,045		d) Transportation Expenses	9,94,503	9,91,729
	iii. In Deposit accounts	1,99,87,916	9,57,21,046		e) Repairs & Maintenance	2,25,581	4,41,768
II.	Grants Received				f) Prior period expenses	4,21,12,151	6,83,47,851
	a) From Government of India	5,42,01,96,118	4,59,73,22,303		g) Finance Cost	7,92,40,362	5,72,70,927
	b) From State Government			II.	Payments against Earmarked/ Endowment Funds	18,83,91,773	7,43,10,545
	c) From others			III.	Payments against Sponsored Projects/Schemes	60,11,31,700	74,48,00,740
	d) Grants in aid receivable for 2020-2021 received during the year			IV.	Payments against Sponsored Fellowships/Scholarships	18,13,87,486	14,97,93,302
III.	Academic Receipts	99,55,98,859	94,25,55,618	V.	Investments and Deposits made	-	
IV.	Receipts against Earmarked/ Endowment Funds	39,74,71,504	20,70,06,180	a)	Out of Earmarked/Endowments funds	80,98,014	
V.	Receipts against Sponsored Projects/Schemes	1,52,23,25,088	1,15,57,26,095	b)	Out of own funds (Investments- Others)}	66,88,29,194	74,54,28,805
VI.	Receipts against sponsored Fellowships and Scholarships	19,04,31,266	16,82,11,760	VI.	Term Deposits with Scheduled Banks		
VII.	Income on Investments from			VII.	Expenditure on Fixed Assets and Capital Works - in- Progress	-	
	a) Earmarked/Endowment funds	2,68,47,413	4,02,91,461	a)	Fixed Assets	13,89,81,350	9,87,28,120
	b) Other investments	2,20,39,776	62,67,861	b)	Capital Works- in- Progress	-	
VIII.	Interest received on			VIII.	Other Payments including statutory payments	2,36,38,67,191	1,28,40,21,613
	a) Bank Deposits					4,98,85,612	
	b) Loans and Advances	3,94,187	-	IX.	Refunds of Grants	2,53,56,75,203	3,65,30,758
	c) Savings Bank Accounts	7,51,01,333	4,11,44,828	X.	Deposits and Advances	49,87,79,734	2,31,85,15,130
IX.	Investments encashed	8,72,46,795	54,59,14,661	XI.	Other Payments		31,28,33,385
X.	Term Deposits with Scheduled Banks encashed		-	XII.	Closing balances	3,19,000	
XI.	Other income (including Prior Period Income)	1,33,18,277	3,92,18,746	a)	Cash in hand	-	3,19,000
XII.	Deposits and Advances	84,39,66,180	44,47,62,548	b)	Bank balances		
XIII.	Miscellaneous Receipts including Statutory Receipts	1,01,02,84,294	94,07,48,702	In	Current Accounts	1,08,29,25,192	97,34,18,376
XIV.	Any Other Receipts - Fixed Asstes/ Direct-Indirect expenses	8,17,09,980	9,38,85,568	In	Savings Accounts	2,96,10,98,474	2,96,45,85,970
				In	Deposit Accounts	2076324.04	1,99,87,916
	<b>TOTAL</b>	<b>14,64,52,53,076</b>	<b>12,75,70,20,392</b>		<b>TOTAL</b>	<b>14,64,52,53,076</b>	<b>12,75,70,20,392</b>

Joint Registrar (F&A)  
Guwahati; June 27, 2024

Registrar

Director





Indian Institute of Technology Guwahati  
Guwahati - 781039  
Assam, India

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