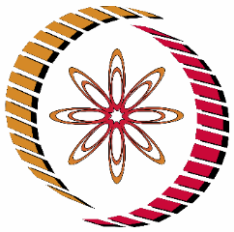
NPTEL

NATIONAL PROGRAMME ON TECHNOLOGY ENHANCED LEARNING



IIT Guwahati MOOCs Courses

Massive Open Online Courses (MOOCs)

The Ministry of Human Resource Development (MHRD) has a MOOC (Massive Open Online Course) scheme under SWAYAM, which refers to the process of course delivery through an online portal open for anyone with an Internet connection. Under this scheme, several higher educational institutes have been entrusted with creating course content primarily at the college and university levels for science, engineering and humanities.

Since 2013, through the online portal, 4-, 8-, and 12-week online courses were delivered semester wise, typically on topics relevant to students in all years of higher technical education along with basic core courses in sciences and humanities with exposure to relevant tools and technologies. The enrolment to and learning from these courses involves no cost. An in-person, proctored certification exam (optional) will be conducted at Rs. 1000/- per course and a certificate is provided through the participating institutions and industry, when applicable.

IIT Guwahati, through Centre for Educational Technology, is very actively involved in the implementation of various Mission projects of National importance under MHRD along with very rigorous academic outreach programs. The vision and mission are to achieve the highest synergy between education, human resource development and the technological integration through collective & collaborative interdisciplinary team work.

IIT Guwahati contribution in 2016 run onwords:

Year	Total Course	Enrolled	Registered	Certified
2016	4	9948	736	418
2017	4	3254	265	135
2018 (Jan)	15	24021	1704	1272
2018 (July)	18	39572	3153	2263
2019 (Jan)	18	51665	5955	4659
2019 (July)	34	90050	7565	4368
2020 (Jan)	30	70462	1922	1259
2020 (July)	46	144010	11962	8335
2021 (Jan)	48	84313	10397	7064
2021 (July)	62	129254	17493	11697
2022 (Jan)	54	105669	16955	11122
2022 (July)	69	130151	24505	16138
2023 (Jan)	61	105453	23769	16091
2023 (July)	78	199847	49017	29942
2024 (Jan)	75	1,39,977	38175	26410
2024 (July)	83	1,95,485	58392	37269

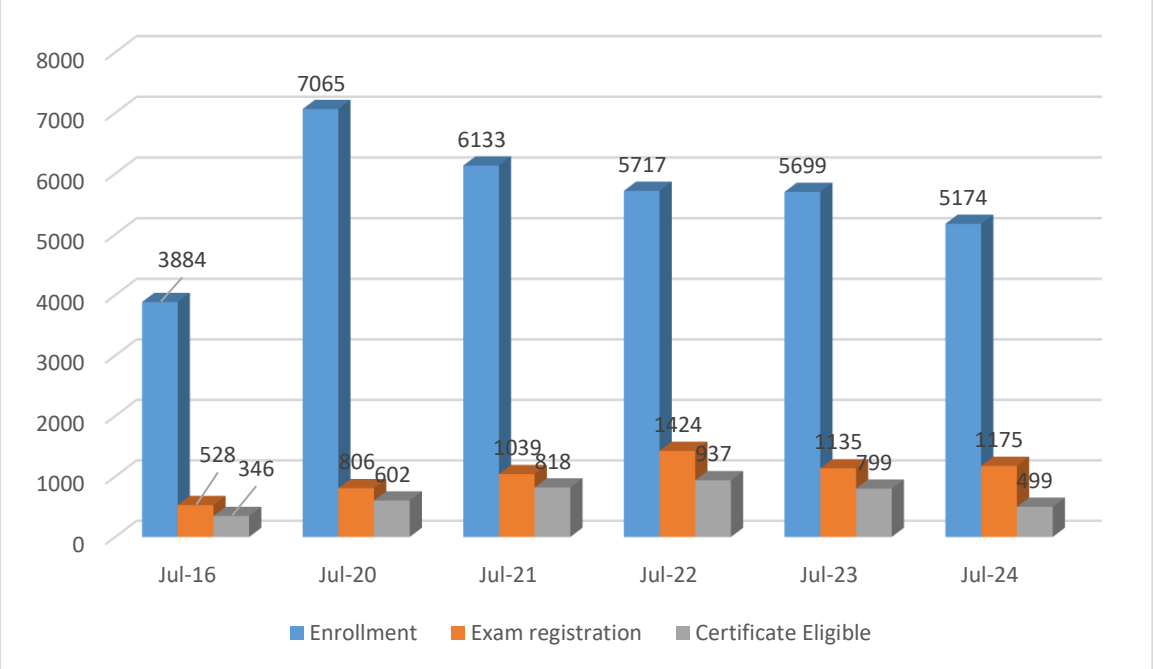
Prof. Manas Das
Mechanical Engineering

Type of the course: New, July 2016 run Duration: 8 weeks

Course Outline:

There is a need for machine tools and processes which can accurately and easily machine the most difficult-to-machine materials and work pieces with intricate and accurate shapes. In order to meet these challenges, a number of newer material removal processes have now been developed to the level of commercial utilization. These newer methods are also called unconventional in the sense that conventional tools are not employed for metal cutting. Instead, energy in its direct form is used to remove the material from the work piece. This course aims at bringing the students up-to-date with the latest technological developments and research trends in the field of unconventional / nontraditional / modern machining processes.

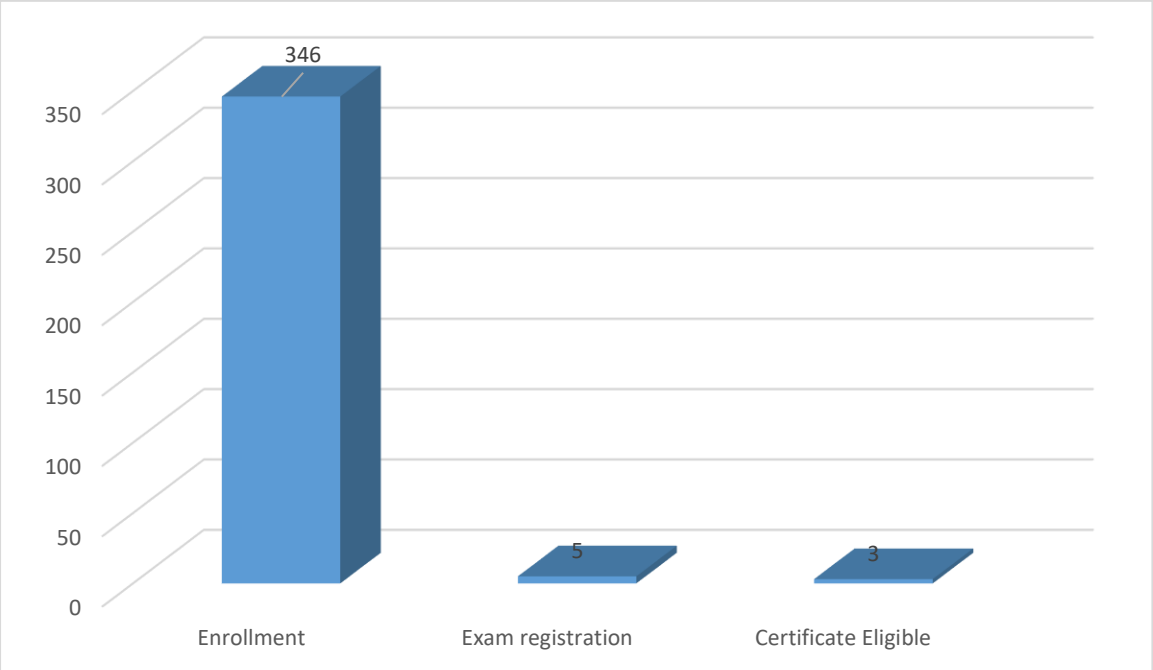
Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2016	New	3884	528	346
Sep-Nov 2020	Rerun	7065	806	602
Aug-Oct 2021	Rerun	6133	1039	818
Jul-Dec 2022	Rerun	5717	1424	937
Jul-Oct 2023	Rerun	5699	1135	799
Jul-Oct 2024	Rerun	5174	1175	499



Prof. Sougata Karmakar Type of the course: New, July 2016 run Duration: 8 weeks
Design

Course Outline:
It is well known that knowledge of 'Ergonomics/ Human Factors Engineering' is of utmost necessity for any product, facility and workplace design to achieve optimal man-machine compatibility in terms of physical, cognitive and environmental factors. While ergonomics evaluation using physical mockups and prototype with real human trials is tiresome, time-consuming, and costly; virtual ergonomics evaluation using CAD model of human and products/facilities is extremely beneficial to get rid of all these issues. The course 'Digital Human Modeling and Simulation for Virtual Ergonomics' deals not only with the basics of Ergonomics but also covers the all the relevant topics related to virtual ergonomics evaluation techniques including its advantages and limitations.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2016	New	346	5	3



Introduction to Crystal Elasticity and Crystal Plasticity

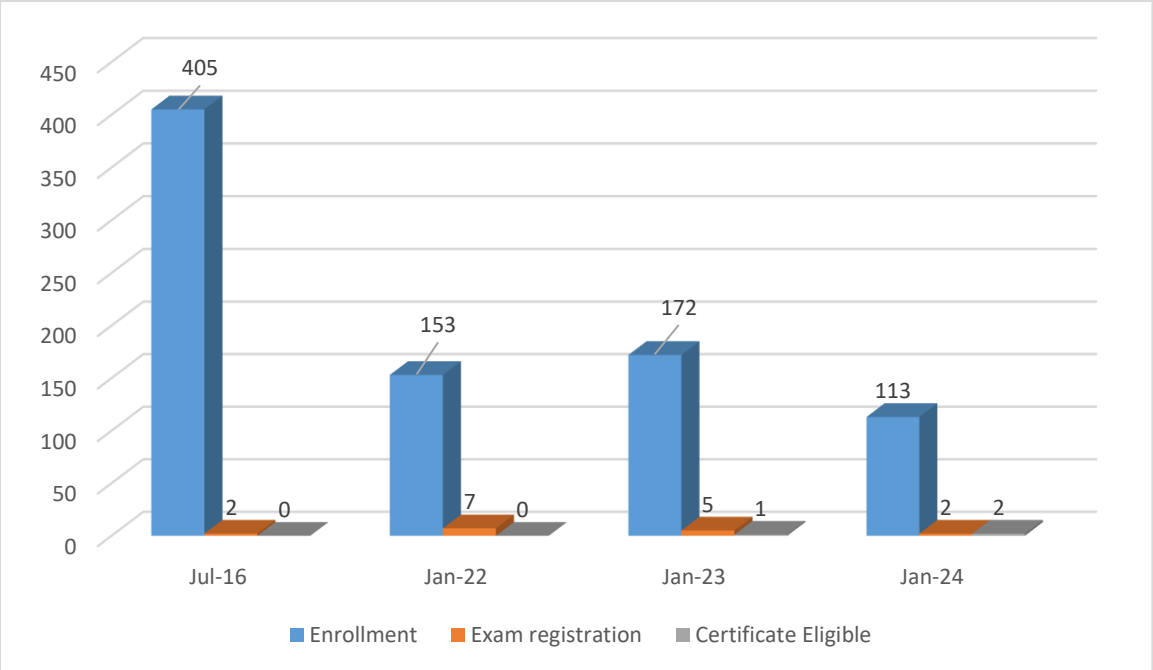
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, July 2016 run Duration: 8 weeks

Course Outline:

This course is primarily designed based on students who are interested in physics-based model in broad area of materials and manufacturing processes. The aim of this course is to bridges the gap between continuum mechanics and material science where the behavior is described at different length scales. The course emphasizes on basic understanding of the related topics by mathematical and physical problems involved in studying mechanical behavior of conventional metals and alloys. Students will be able to develop fundamental understanding on the response of common engineering materials to mechanical loading at different length scales through the lectures and will be reinforced through assignments. The course is highly enjoyable to the beginners as it will be presented in most simplified way.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2016	New	405	2	0
Feb-Apr 2022	Repeat	153	7	0
Jan-Apr 2023	Repeat	172	5	1
Jan-Mar 2024	Repeat	113	2	2



Prof. S. Biswas
Computer Science and Engineering

Prof. A. Sarkar
Computer Science and Engineering

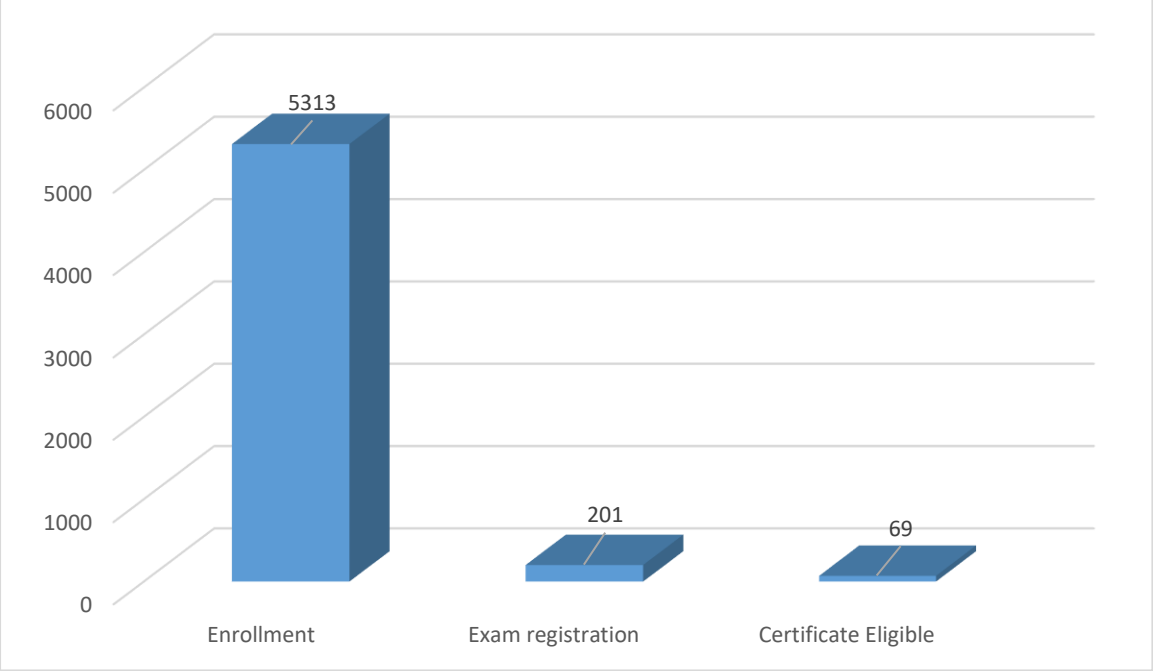
Prof. J. K. Deka
Computer Science and Engineering

Type of the course: New, July 2016 run
Duration: 12 weeks

Course Outline:

Digital VLSI Design flow comprises three basic phases: Design, Verification and Test. The web course would cover theoretical, implementation and CAD tools pertaining to these three phases. Although there can be individual full courses for each of these phases, the present course aims at covering the important problems/algorithms/tools so that students get a comprehensive idea of the whole digital VLSI design flow. VLSI Design: High level Synthesis, Verilog RTL Design, Combinational and Sequential Synthesis Logic Synthesis (for large circuits). Verification Techniques: Introduction to Hardware Verification and methodologies, Binary Decision Diagrams (BDDs) and algorithms over BDDs, Combinational equivalence checking, Temporal Logics, Modeling sequential systems and model checking, Symbolic model checking. VLSI Testing: Introduction, Fault models, Fault Simulation, Test generation for combinational circuits, Test generation algorithms for sequential circuits and Built in Self-test.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2016	New	5313	201	69



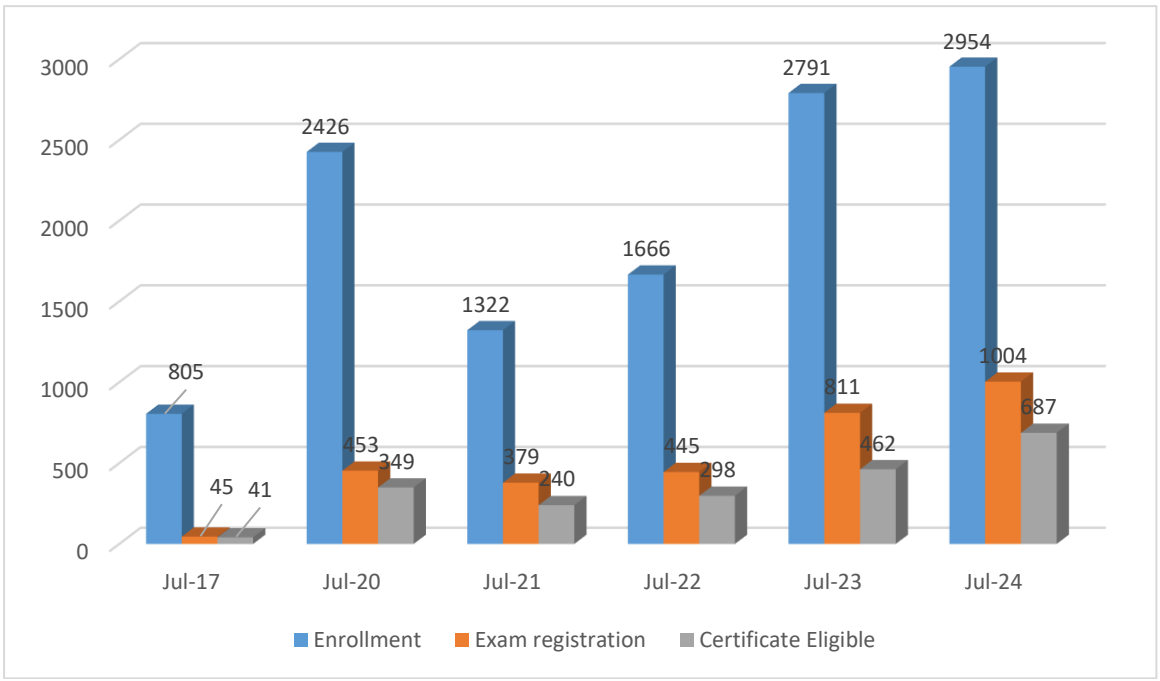
Prof. Ngamjahao Kipgen
Humanities and Social Sciences

Type of the course: New, July 2017 run Duration: 12 weeks

Course Outline:

The course focuses on the ecology of human societies human-environment relationships, with reference to cultural ecology and issues surrounding sustainable development. The ecology of human societies is about connections between ecological and human social, cultural, and organizational processes. Based on selected works of ecological anthropologists, this course focuses on the dynamic relationships between human cultures and their ecological environments. It uses basic concepts of anthropology, including the concept of culture as a dynamic system of learned behaviors and beliefs, to better understand how human beings adapt to and change their physical and social surroundings.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2017	New	805	45	41
Sep-Dec 2020	Rerun	2426	453	349
Jul-Oct 2021	Rerun	1322	379	240
Jul-Dec 2022	Rerun	1666	445	298
Jul-Oct 2023	Rerun	2791	811	462
Jul-Oct 2024	Rerun	2954	1004	687



Gender and Literature

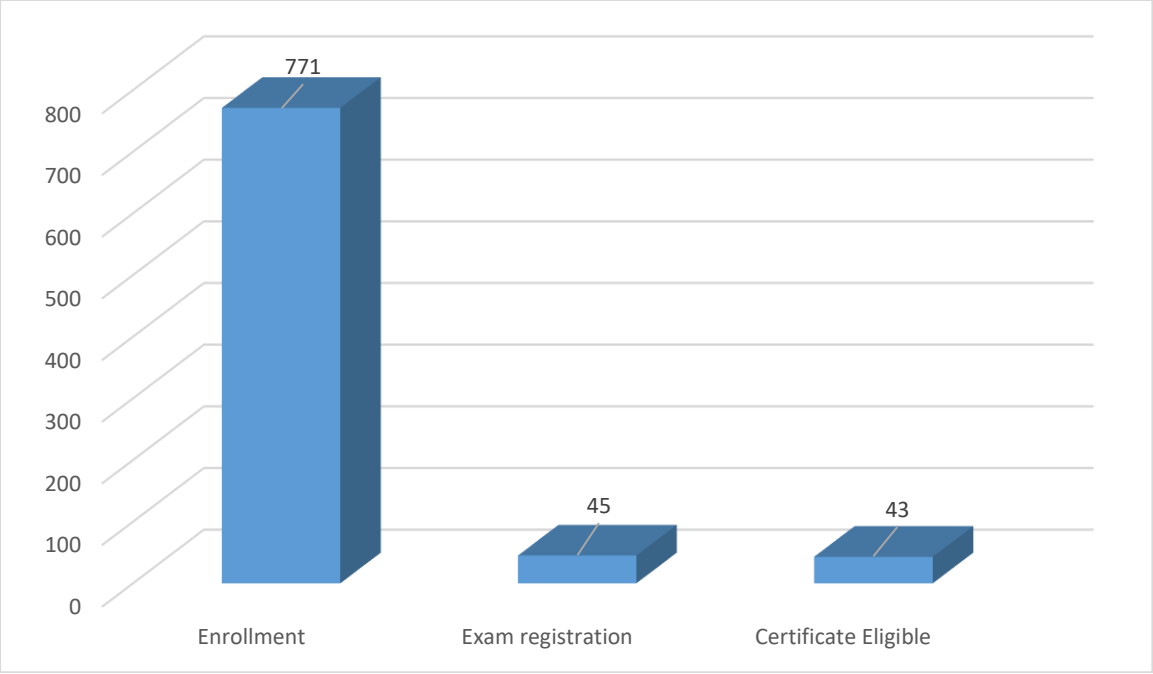
Prof. Avishek Parui
Humanities and Social Sciences

Type of the course: New, July 2017 run Duration: 8 weeks

Course Outline:

Gender and Literature is an examination of selected literary texts and cultural conditions from the standpoint of gender theory. It will draw on established scholarship on gender studies and take the student through the various configurations and reconfigurations that determine gendered classifications such as masculinity and femininity.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2017	New	771	45	43



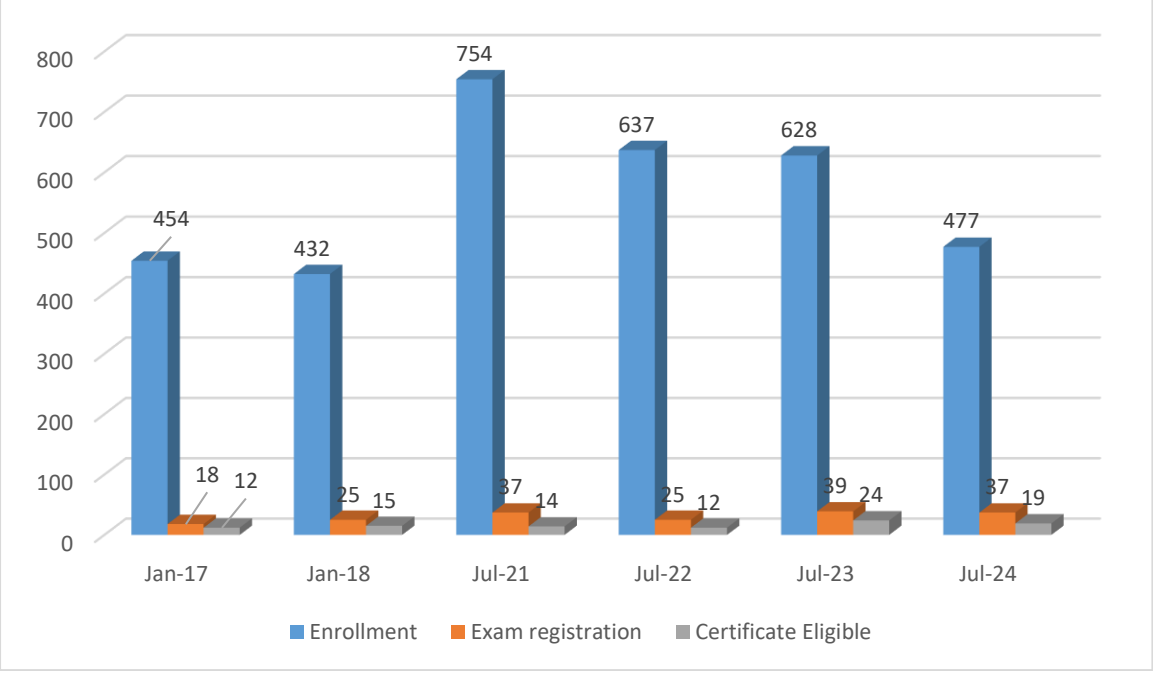
Prof. Biplab Bose
Biosciences and Bioengineering

Type of the course: New, Jan 2017 run Duration: 4 weeks

Course Outline:

Mathematical modeling has become integral part of different fields of biology, from ecology to cell biology. This course is intended to introduce students of biology to elementary mathematical concepts and tools for dynamical models. The course will focus on modeling using ordinary differential equations (ODEs). We will start with basic mathematical concepts of ODE-based models and then connect those with experimental biology. Mathematical models will be on cellular and molecular processes in biology, like cell signaling, and transcriptional networks. Students will learn basics of analytical techniques, graphical techniques, and numerical simulation.

Timeline	Type	Enrolled	Registered	Certified
Jan-Feb 2017	New	454	18	12
Feb-Mar 2018	Rerun	432	25	15
Aug-Sep 2021	Rerun	754	37	14
Jul-Dec 2022	Repeat	637	25	12
Jul-Oct 2023	Repeat	628	39	24
Jul-Oct 2024	Repeat	477	37	19



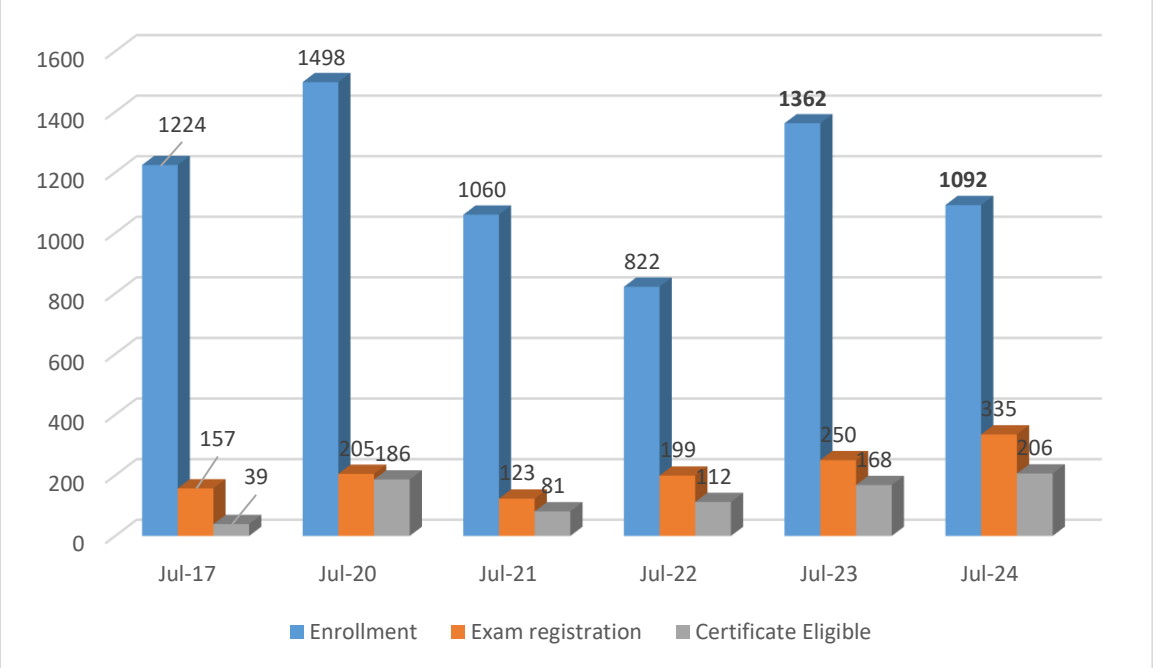
Prof. Sambit Mallick
Humanities and Social Sciences

Type of the course: New, July 2017 run Duration: 12 weeks

Course Outline:

The objective of the course is to enable students to understand science as a socio-cultural product in specific socio-historical contexts. The course exposes students to philosophical, historical and sociological perspectives to look at science as a practice deeply embedded in culture and society. It emphasizes the dynamic nature of the relations between wider cultural practices on one hand and scientific practices on the other. The attempt is to equip students with an understanding indispensable for an in-depth study of science-technology-society dynamics.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2017	New	1224	157	39
Sep-Dec 2020	Rerun	1498	205	186
Jul-Oct 2021	Rerun	1060	123	81
Jul-Dec 2022	Rerun	822	199	112
Jul-Oct 2023	Rerun	1362	250	168
Jul-Oct 2024	Rerun	1092	335	206



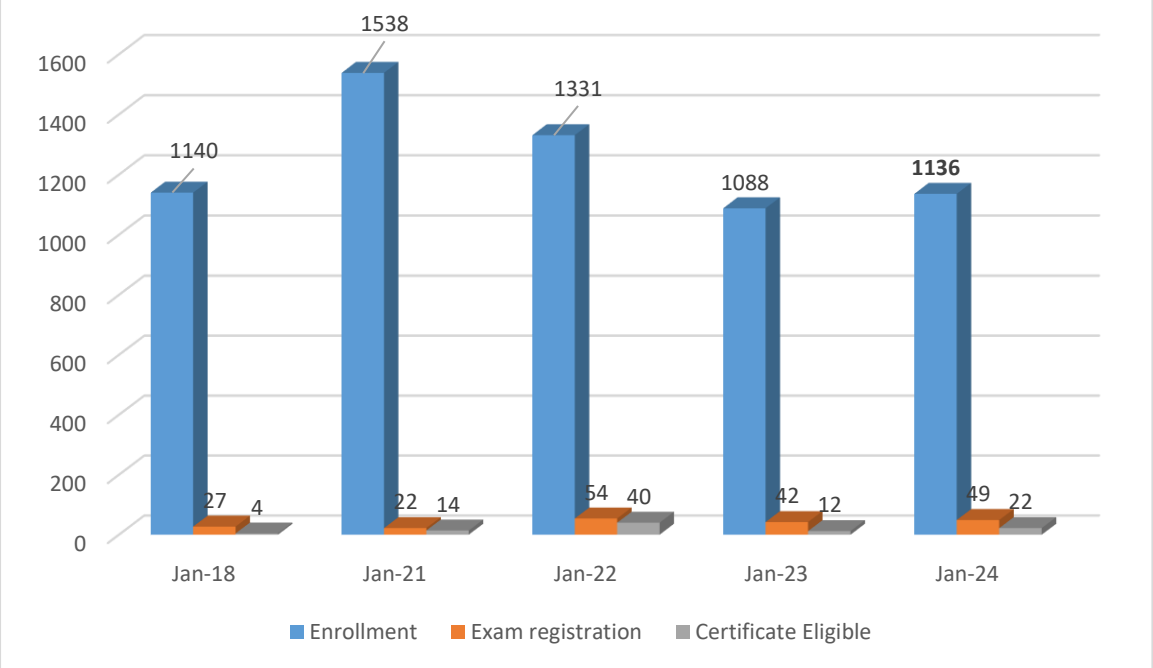
Prof. Saurabh Basu
Physics

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

The Course deals with the prerequisite material for studying advanced level research in Condensed Matter Physics. The course begins with a preliminary discussion on second quantization, followed by zero temperature and Matsubara Greens functions. Applications to Hubbard model, Kane Mele model and superconductivity are discussed.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	1140	27	4
Jan-Mar 2021	Rerun	1538	22	14
Jan-Mar 2022	Repeat	1331	54	40
Jan-Mar 2023	Repeat	1088	42	12
Jan-Mar 2024	Repeat	1136	49	22



Advances in Welding and Joining Technologies

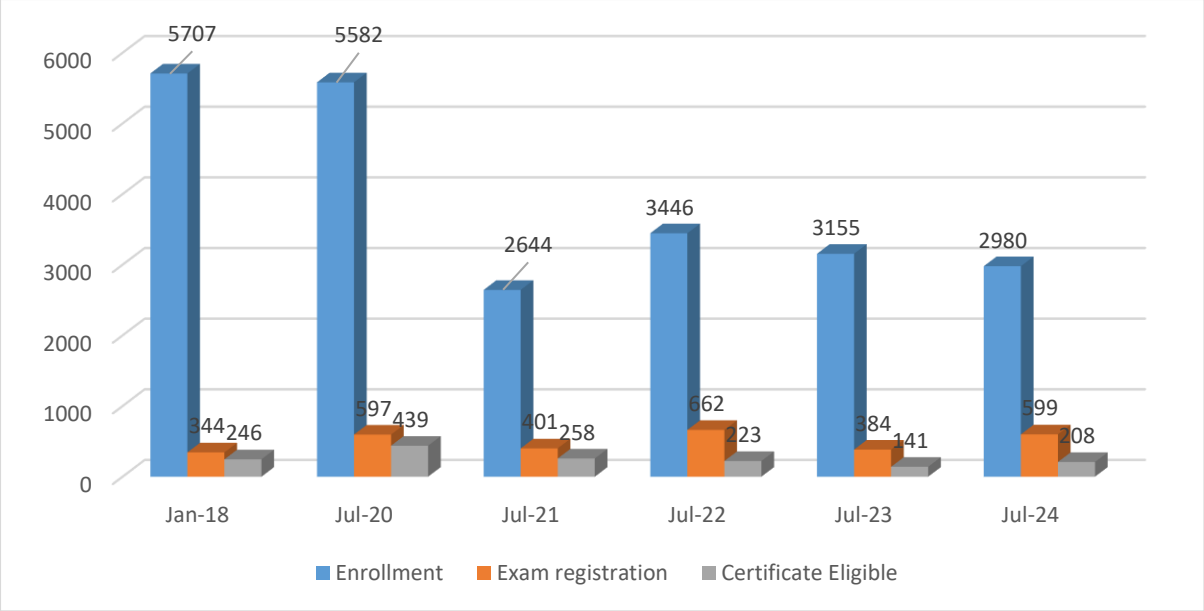
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

The progress of several welding and joining processes is ever increasing with the development of new materials and their application in modern technologies. The microjoining and nanojoining is even more challenging area with the development of miniature components. This course is primarily designed from fundamental understanding to the most recent advances in welding and joining technologies. The syllabus is oriented to the advancement of the joining technologies which is different from conventional welding and joining processes. The modules cover almost all the direction of joining technologies and it is blended with fundamental development to the recent technologies. Audience will be able to develop fundamental understanding on different perspective and recent development in this field through the lectures and reinforce their knowledge by solving assignments. This course is presented in a lucid and the progress of several welding and joining processes is ever increasing with the development of new materials and their application in modern technologies. The microjoining and nanojoining is even more challenging area with the development of miniature components. This course is primarily designed from fundamental understanding to the most recent advances in welding and joining technologies. The syllabus is oriented to the advancement of the joining technologies which is different from conventional welding and joining processes. The modules cover almost all the direction of joining technologies and it is blended with fundamental development to the recent technologies. Audience will be able to develop fundamental understanding on different perspective and recent development in this field through the lectures and reinforce their knowledge by solving assignments. This course is presented in a lucid and simplified way to make it enjoyable to the beginners.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	5707	344	246
Sep-Nov 2020	Rerun	5582	597	439
Jul-Sep 2021	Rerun	2644	401	258
Jul-Dec 2022	Rerun	3446	662	223
Jul-Oct 2023	Rerun	3155	384	141
Jul-Oct 2024	Rerun as Repeat	2980	599	208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Jan-18
Jul-20
Jul-21
Jul-22
Jul-23
Jul-24
Enrollment
Exam registration
Certificate Eligible

An Introduction to Cardiovascular Fluid Mechanics

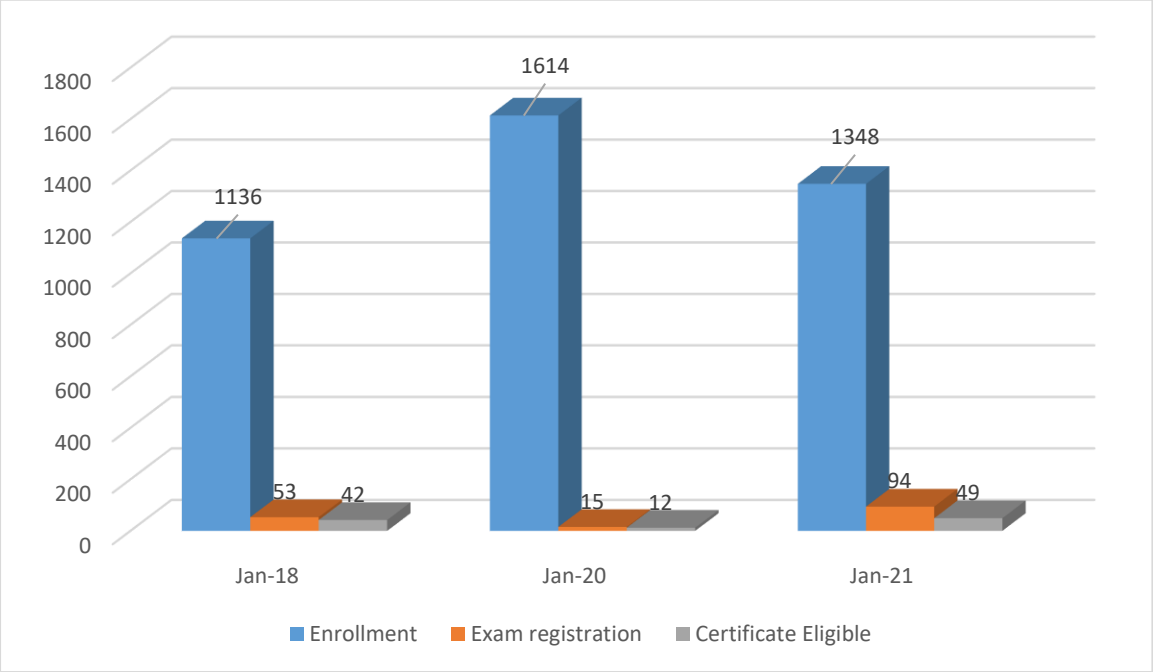
Prof. Raghvendra Gupta
Chemical Engineering

Type of the course: New, Jan 2018 run Duration: 4 weeks

Course Outline:

This course aims to provide an overview of the important problems in human circulatory system. The course would provide introduction to cardiovascular systems and important fluid flow problems in large arteries. The goal is to provide students with the necessary background to apply the knowledge of fluid mechanics to analyze the flow behavior in biological systems in general and human circulatory system in particular. It is hoped that with this course, the students would be able to develop a perspective towards the design and development of diagnostics and medical device development.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	1136	53	42
Jan-Feb 2020	Rerun	1614	15	12
Jan-Feb 2021	Rerun	1348	94	49



Prof. S. Biswas
Computer Science and Engineering

Prof. A. Sarkar
Computer Science and Engineering

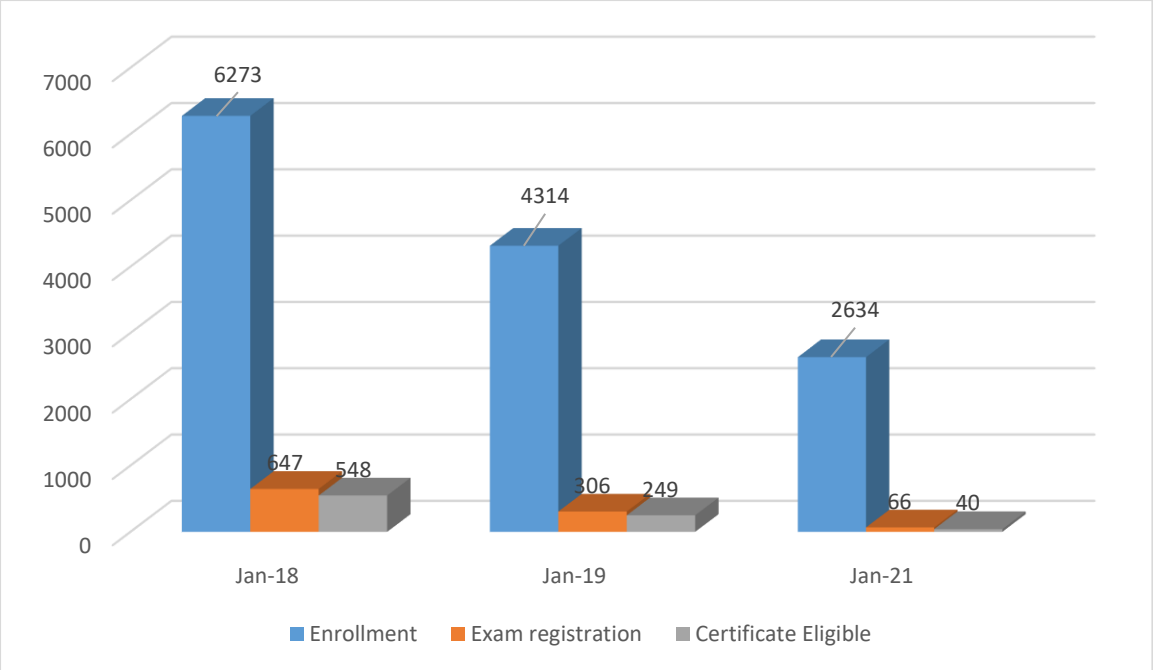
Prof. J. K. Deka
Computer Science and Engineering

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

Computer Organization and Architecture (COA) is a core course in the curricula of Computer Sciences as well as Electronics and Electrical Engineering disciplines at the second-year level in most of the Indian universities and technical institutions. This is the first course in COA and the course would provide students with an understanding of the design of fundamental blocks used for building a computer system and interfacing techniques of these blocks to achieve different configurations of an "entire computer system". This course will be developed and taught with respect to Objectives based on Bloom's Taxonomy. First, we will highlight the main objectives the course is aimed to achieve. Following that, at each module, we will specify the module level objectives and demonstrate how these objectives meet the course level main goals in unison. At the leaf level i.e., the units, we will point the specific objectives of the lecture. Also, it will be demonstrated how the unit level objectives satisfy the parent module level objectives. Further, each module will have a module level problem which needs concepts of all the units therein to solve. Finally, a comprehensive course level problem related to design of "entire computer system" will be discussed which meets all the course level objectives

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	6273	647	548
Jan-Apr 2019	Rerun	4314	306	249
Jan-Apr 2021	Rerun	2634	66	40



Fluidization Engineering

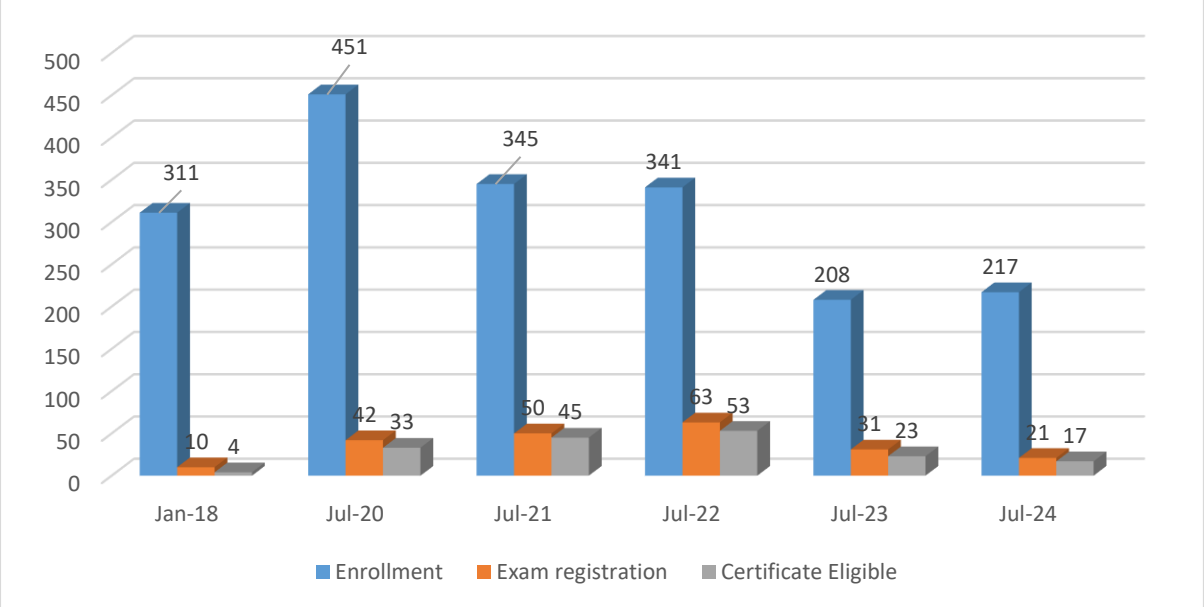
Prof. S. K. Majumder
Chemical Engineering

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

This course is intended for learners who find themselves involved ranging from pure academic interest to direct industrial necessity in problems concerning the fluidized state. This course mainly covers the basic principles of fluidization phenomena and introduces the learner to the fundamental and practical aspects of basic fluidization operations for industrial application. This course may also be useful for who are doing research in multiphase system in chemical, metallurgical, and mining engineering programs.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	311	10	4
Sep-Dec 2020	Rerun	451	42	33
Jul-Oct 2021	Rerun	345	50	45
Jul-Dec 2022	Rerun	341	63	53
Jul-Oct 2023	Repeat	208	31	23
Jul-Oct 2024	Repeat	217	21	17



Fundamentals of Nuclear Power Generation

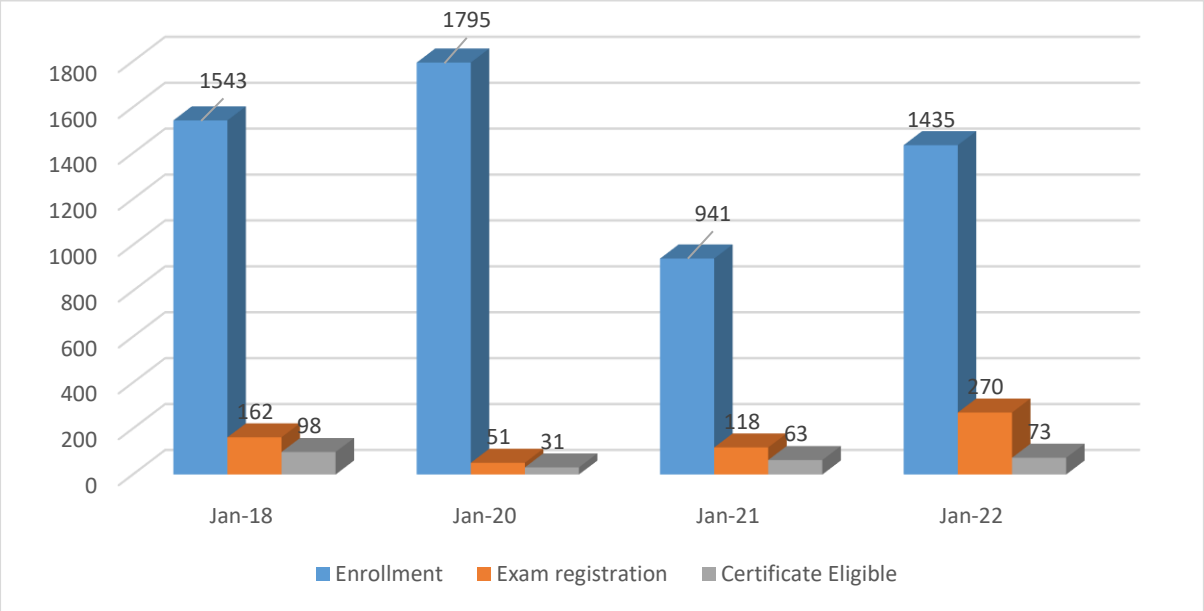
Prof. Dipankar N. Basu
Mechanical Engineering

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

The depleting stock of fossil fuels and global concern over the preservation of environment has projected nuclear energy as a very relevant option, particularly considering the near-zero emission and huge resource availability. From technological point of view, nuclear power production is quite different from the conventional thermal plants and therefore it is the need of the hour to grasp the essentials at an early level. Present course introduces the students to the fundaments of nuclear power generation. Starting from the atomic structure, students will be gradually familiarized with different concepts, finally leading to the design of different reactors. Important topics such as nuclear waste management, biological impact of radiation and safety issues pertinent to handling nuclear fuels will also be discussed.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	1543	162	98
Jan-Apr 2020	Rerun	1795	51	31
Jan-Apr 2021	Rerun	941	118	63
Jan-Apr 2022	Rerun	1435	270	73



Introduction to Cognitive Psychology

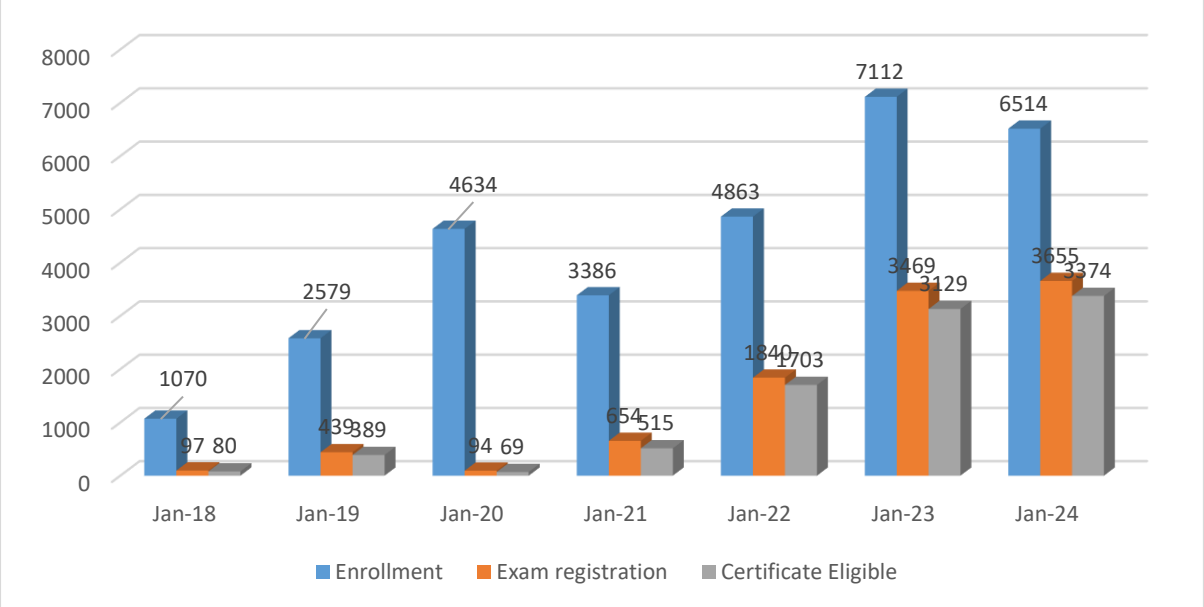
Prof. Naveen Kashyap
Humanities and Social Sciences

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

One of the most puzzling fact for humans over the centuries has been the understanding of human behavior. Understanding and predicting human behavior will help humans in exerting more control over situations. The bases of human behavior are the cognitive processes underlying them. The present course is an attempt to discuss and understand the basic cognitive processes that guide human behavior. The knowledge from the course will be useful in tackling everyday problems and attaining optimal solutions. Additionally, we can use knowledge about human cognitive systems in designing sophisticated Artificial Intelligence (AI) systems that learn from mistakes and make our lives a lot easier to live.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	1070	97	80
Jan-Apr 2019	Rerun	2579	439	389
Jan-Apr 2020	Rerun	4634	94	69
Jan-Apr 2021	Rerun	3386	654	515
Jan-Apr 2022	Rerun	4863	1840	1703
Jan-Apr 2023	Rerun	7112	3469	3129
Jan-Apr 2024	Rerun	6514	3655	3374



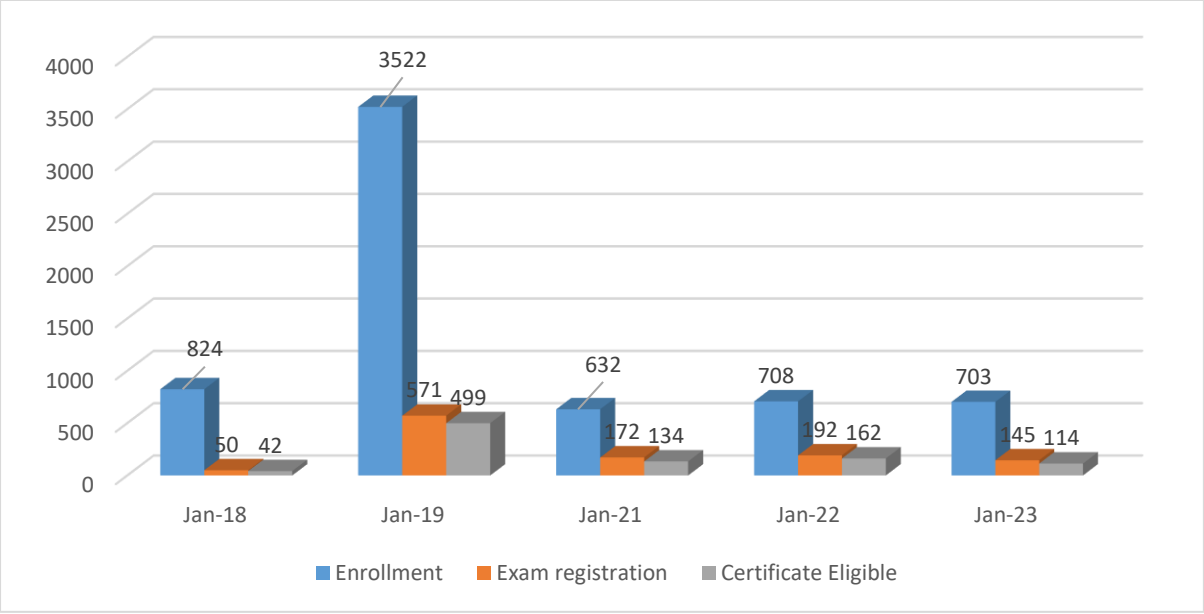
Prof. Mamilla Ravi Sankar
Mechanical Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

Machining is one of the basic and very important courses for the mechanical undergraduate students. This process comes under the subtractive manufacturing processes where in material is removed. This course gives the basic understanding of the various machining processes and its physics. The mentioned syllabus is systematic order to understand gradually, importance of machining, machining region mechanism, tool signatures, tool life, multipoint machining processes, cutting fluid, cutting fluid emissions and its effect on human kind. This course also gives emphasis on cutting fluid emissions and its effect on operators, environment and water pollution. How to develop the eco-friendly cutting fluids as an alternative to commercial miner oils? Development of sustainable cutting fluids application techniques to improve the machining performance. This course is systemically arranged and taught in smooth as well as clear way so that students understand easily.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	824	50	42
Feb-Apr 2019	Rerun	3522	571	499
Jan-Mar 2021	Rerun	632	172	134
Jan-Mar 2022	Rerun	708	192	162
Jan-Mar 2023	Rerun	703	145	114



Measurement Technique in Multiphase Flows

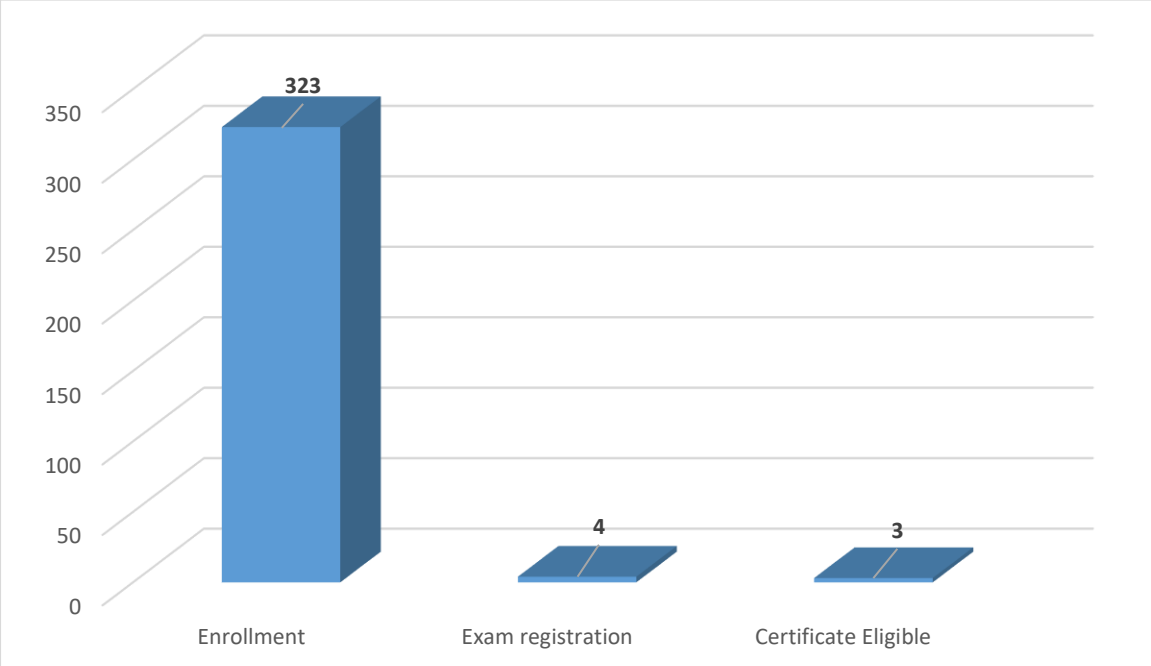
Prof. Rajesh Kumar Upadhyay
Chemical Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

Multiphase flow reactors are heart of many process industries. However, the flow dynamics of these reactors are not well understood mainly because of complex flow physics involved. In this course different technique available for monitoring and mapping of multiphase flow reactors will be discussed in detail. Techniques will be divided in two parts: Invasive, in which some probe will be intruded inside the vessel to measure the velocity and/or phase fraction and in Second part non-invasive techniques will be discussed in which measurement will be performed without disturbing the flow. The basic principle, equations, post processing methods, advantages and limitations of each technique will be discussed in detail.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	323	4	3



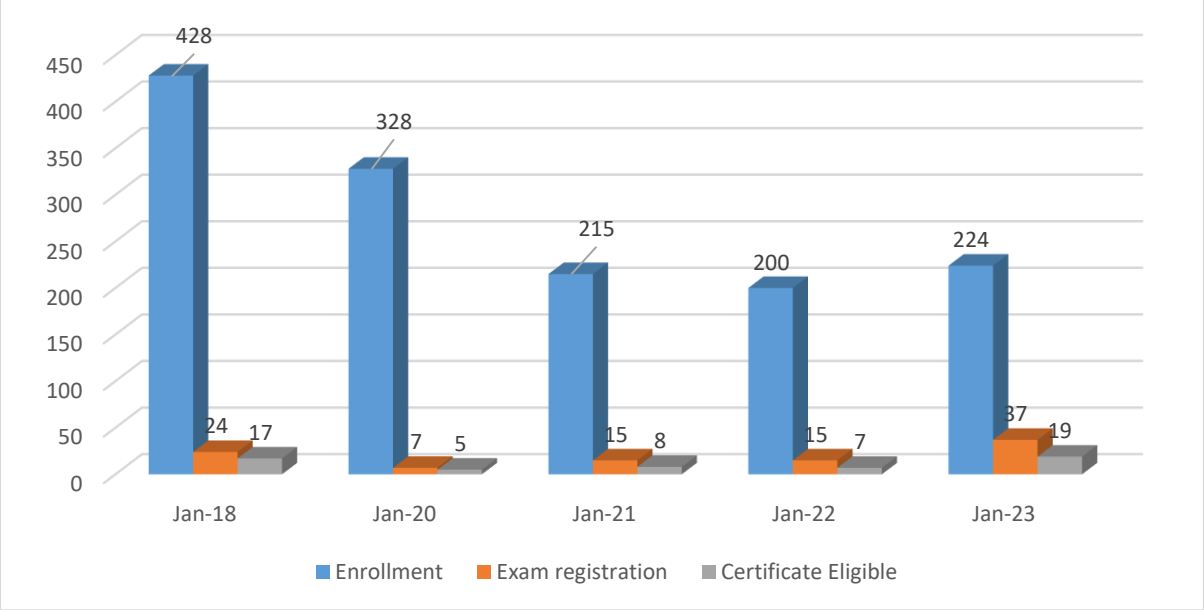
Prof. Rajesh Kumar Upadhyay
Chemical Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

Multiphase flow reactors are critically important many industries like, chemical, petroleum, petrochemicals, food, pharmaceuticals etc. The performances of these reactors largely depend on the interactions of different phases involved. In this course basic of Multiphase flow along with different flow regime map and pressure drop, and volume fraction calculation will be covered. Further, the interaction between different phases at different scales will be discussed. Modelling methods used for multiphase flow reactors will be covered. Finally, different type of multiphase flow reactors will be introduced and their functioning, advantage and disadvantages and challenges along with future direction of research will be discussed.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	428	24	17
Jan-Mar 2020	Rerun	328	7	5
Jan-Mar 2021	Rerun	215	15	8
Jan-Mar 2022	Rerun	200	15	7
Jan-Mar 2023	Rerun	224	37	19



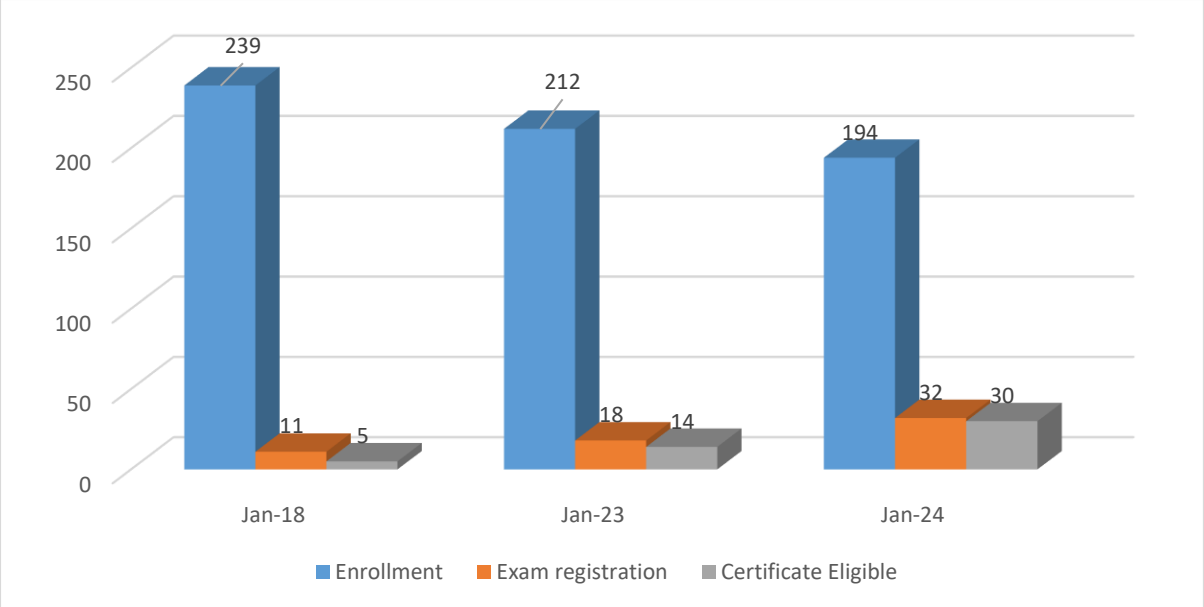
Prof. Raghvendra Gupta
Chemical Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

With the advancement in manufacturing technology in past few decades, the trend towards miniaturization has accelerated in several industries. In chemical process industries, the viability of compact heat exchangers, microreactors for process intensification is being explored because of small diffusion lengths, high interfacial area density and relatively safe operation. Most of these equipments involve multiphase flows and their design requires a fundamental understanding of heat, mass and momentum transport in multiphase flow in microchannels. This course is aimed at introducing the students with the fundamental principles as well as recent developments in the area of multiphase flow at the small scale.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	239	11	5
Jan-Apr 2023	Rerun	212	18	14
Jan-Mar 2024	Repeat	194	32	30



Nuclear and Particle Physics

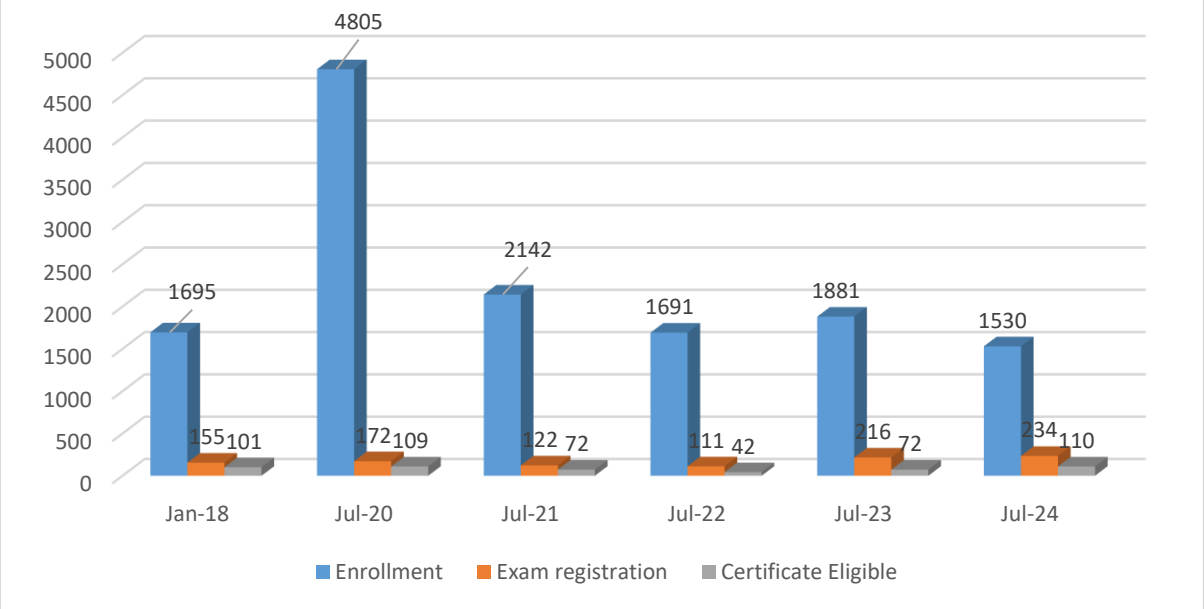
Prof. Poulose Poulose
Physics

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

The first part of the course will discuss nuclear physics. Properties of nuclei and details of popular nuclear models, properties of nuclear decays and nuclear reactions will be discussed in brief, but in a self-consistent manner. The second part will discuss the basics of particle physics. In this part, the fundamental forces and the dynamics of elementary particles under these forces will be considered. After introducing relativistic quantum mechanics, relativistic formulation of Maxwell's Equations and quantum electrodynamics will be discussed. This will be developed into the weak and strong nuclear forces based on the principle of gauge symmetry. The course will also introduce the physical principles of particle accelerators and detectors, including a very brief picture of the modern-day complex detectors.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	1695	155	101
Sep-Dec 2020	Rerun	4805	172	109
Jul-Oct 2021	Rerun	2142	122	72
Jul-Dec 2022	Rerun	1691	111	42
Jul-Oct 2023	Rerun	1881	216	72
Jul-Oct 2024	Rerun	1530	234	110



Prof. Chandan Karfa
Computer Science and Engineering

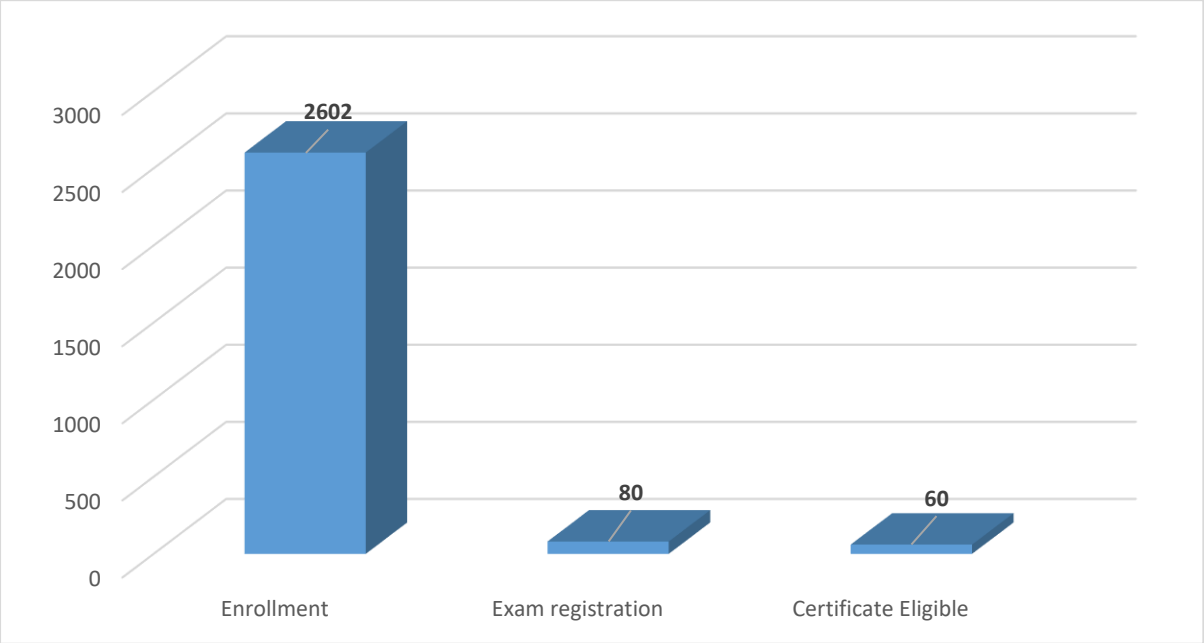
Prof. Santosh Biswas
Computer Science and Engineering

Type of the course: New, Jan 2018 run Duration: 8 weeks

Course Outline:

Digital VLSI Design flow comprises three basic phases: Design, Verification and Test. This course will give a brief overview of the VLSI design flow. The primary emphasis of the course is to introduce the important optimization techniques applied in the Industry level electronic design automation (EDA) tools in the VLSI design flow. This course is unique in the sense that it will give a comprehensive idea about the widely used optimization techniques and their impact the generated hardware. The outline of the course is as follows: VLSI Design: Overview of digital VLSI design flow; High-level Synthesis, logic synthesis and physical synthesis and optimization techniques applied in these three steps; Impact of compiler optimization on hardware synthesis, 2-level logic optimization, multi-level logic optimizations, ESPRESSO; Technology Mapping: DSP and RAM inference for FPGA. RTL Optimizations: Area, power and timing optimization techniques like retiming, register balancing, folding. pipelining, and clock gating. VLSI Test: Introduction to Automatic Test Pattern Generation (ATPG), optimization Techniques for ATPG, design for Testability, optimization Techniques for design for testability, High-level fault modeling, RTL level Testing Verification: LTL and CTL based hardware verification, verification of large systems, binary decision diagram (BDD) based verification, arithmetic decision diagram based (ADD) and high-level decision diagram (HDD) based verification, symbolic model checking, bounded model checking.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2018	New	2602	80	60



Sociological Perspectives on Modernity

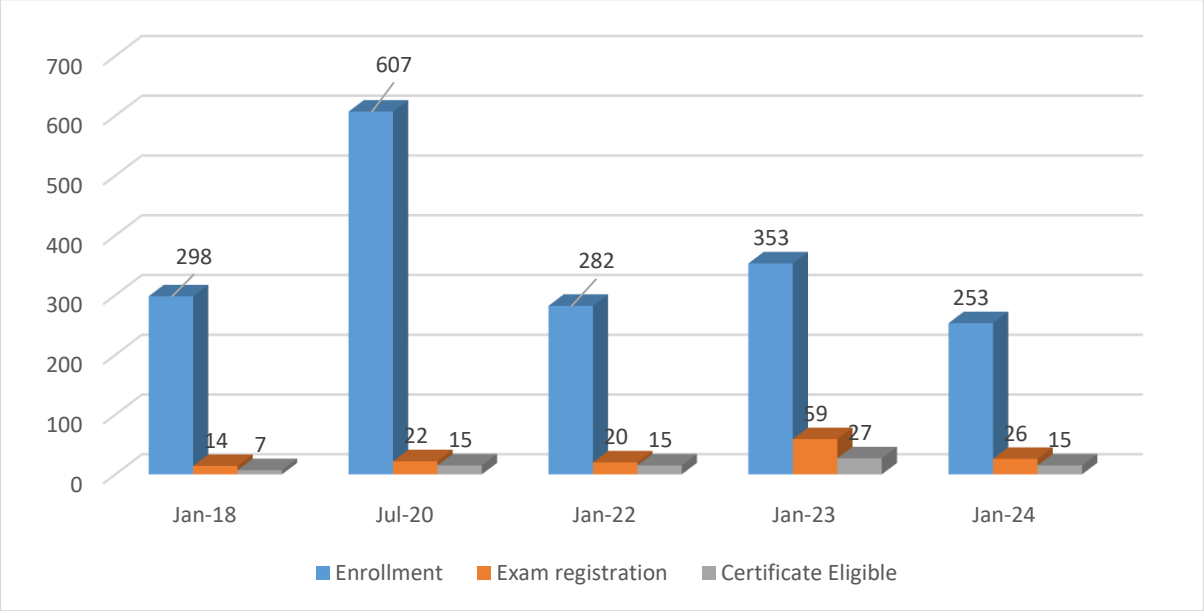
Prof. Sambit Mallik
Humanities and Social Sciences

Type of the course: New, Jan 2018 run Duration: 12 weeks

Course Outline:

The objective of the course is to enable students to understand modernity as a socio-cultural product in specific socio-historical contexts. The course exposes students to theoretical perspectives to look at modernity and its constituents as a practice deeply embedded in culture and society. It familiarizes students with encountering problems in their everyday life from more rationalist perspectives. It attempts to critically engage with and interrogate the multiple views on modernity.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2018	New	298	14	7
Sep-Dec 2020	Rerun	607	22	15
Jan-Apr 2022	Rerun	282	20	15
Jan-Apr 2023	Rerun	353	59	27
Jan-Apr 2024	Repeat	253	26	15



Advanced Quantum Mechanics with Applications

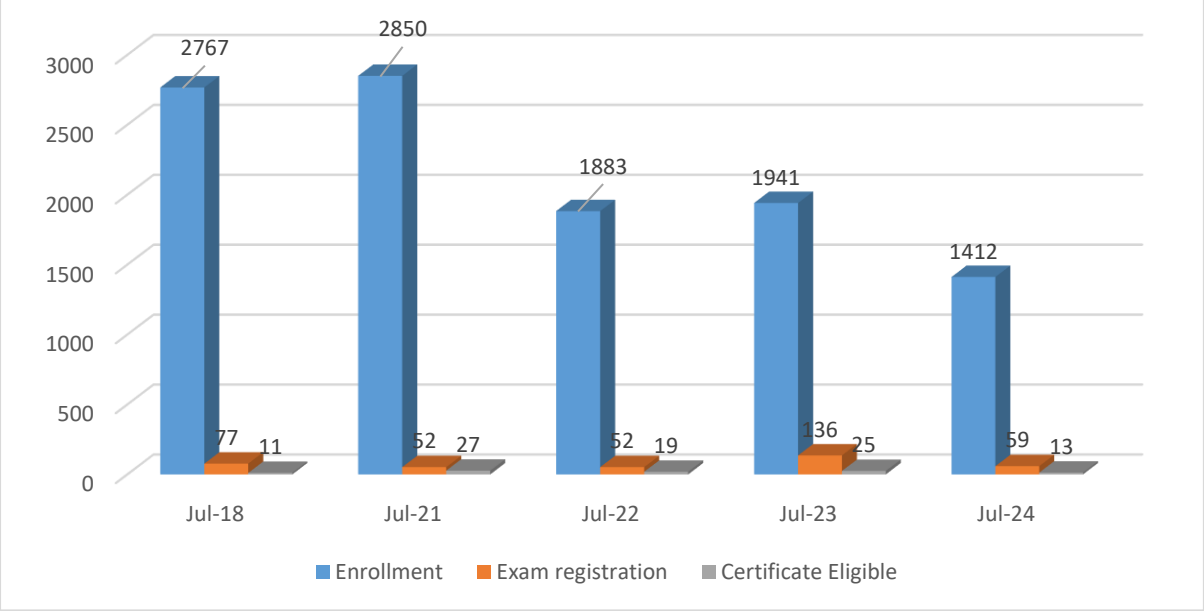
Prof Saurabh Basu
Physics

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

The Course deals with the prerequisite material for studying advanced level research in various fields of Physics, Applied Physics and Electrical Engineering. The course begins with an introduction to advanced topics, such as, the Density Matrix formalism and its applications to quantum optics. Hence angular momentum is introduced to discuss nuclear magnetic resonance. Hence basics of quantum information theory is brought into consideration with a view to explain quantum information algorithms. Quantum dynamics is hence studied with a view to understand quantum optics for driven systems. A glossary of the approximate methods is described with a few examples. Finally, basics of quantum transport is presented to understand the conductance properties of semiconductors.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2767	77	11
Jul-Sep 2021	Rerun	2850	52	27
Jul-Dec 2022	Rerun	1883	52	19
Jul-Sep 2023	Rerun	1941	136	25
Jul-Sep 2024	Repeat	1412	59	13



Advanced Topics in Probability and Random Processes

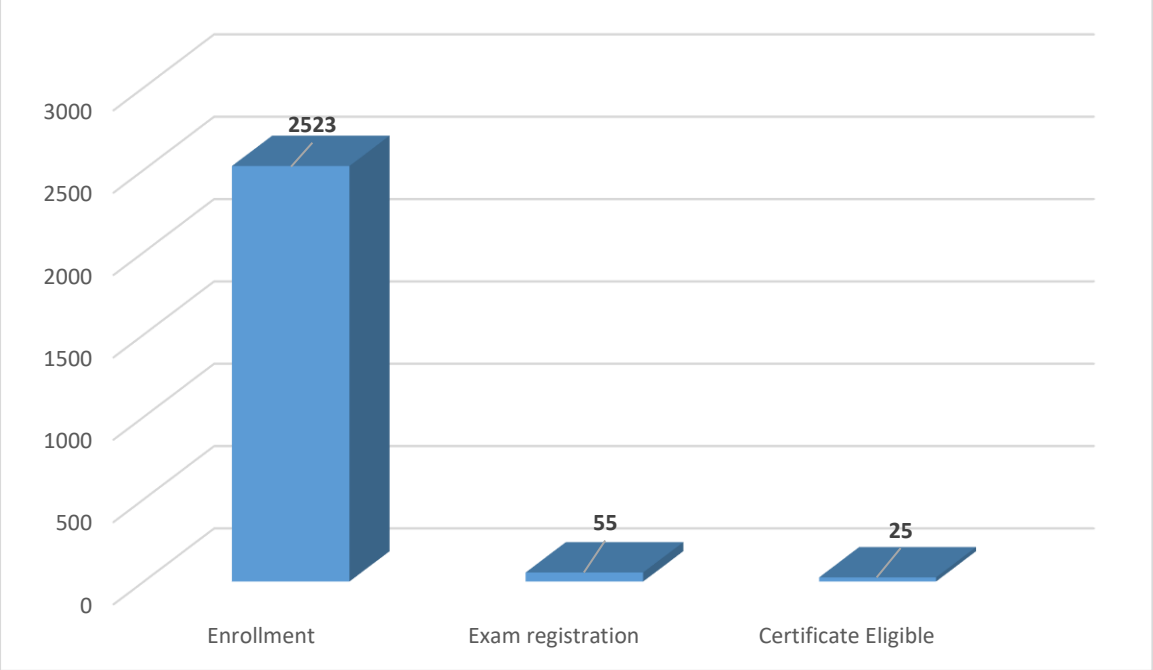
Prof. P. K. Bora
Electronics and Communication Engineering

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

The course will cover mainly two broad areas: (1) the concepts of the convergence a sequence of random variables leading to the explanation of important concepts like the laws of large numbers, central limit theorem; and (2) Markov chains that include the analysis of discrete and continuous time Markov Chains and their applications.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2523	55	25



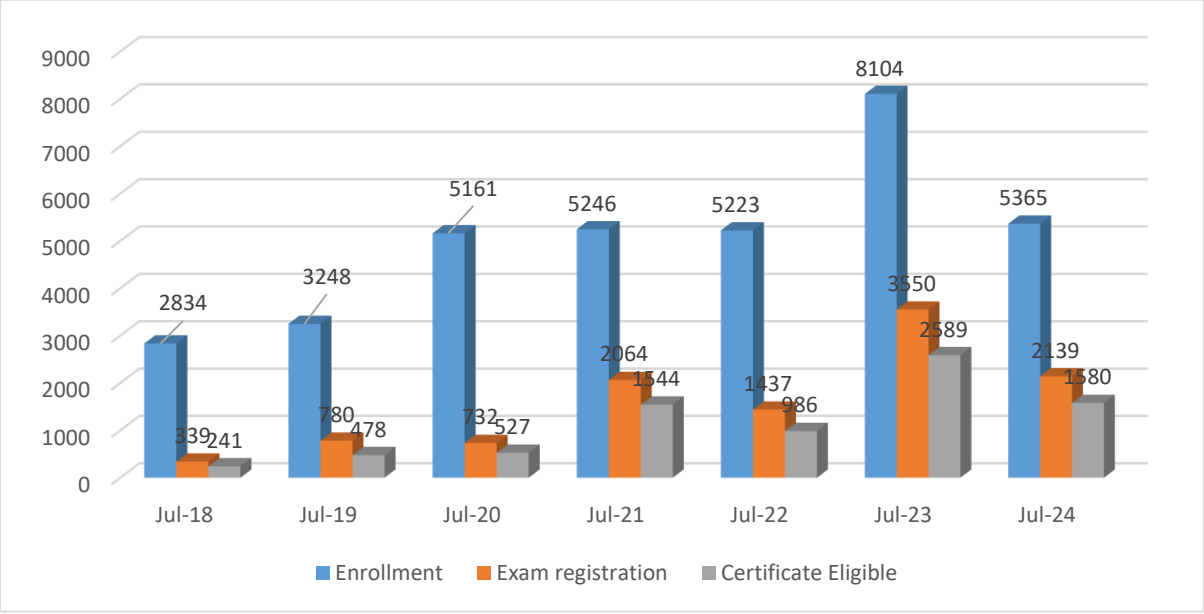
Prof. Naveen Kashyap
Humanities and Social Sciences

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

Human beings have basic needs that they fulfill by making transactions in the market. Transactions mostly in the form of monetary exchange for goods and services are very basic for the survival of the human race. The present course is designed to study how consumers behave on the market and what the consequences of various behavior patterns. Additionally, the present course also looks at various psychological factors that shape the behavior and actions of the consumer in the global market.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2834	339	241
Jul-Sep 2019	Rerun	3248	780	478
Sep-Nov 2020	Rerun	5161	732	527
Jul-Sep 2021	Rerun	5246	2064	1544
Jul-Dec 2022	Rerun	5223	1437	986
Jul-Oct 2023	Rerun	8104	3550	2589
Jul-Sep 2024	Rerun as Repeat	5365	2139	1580



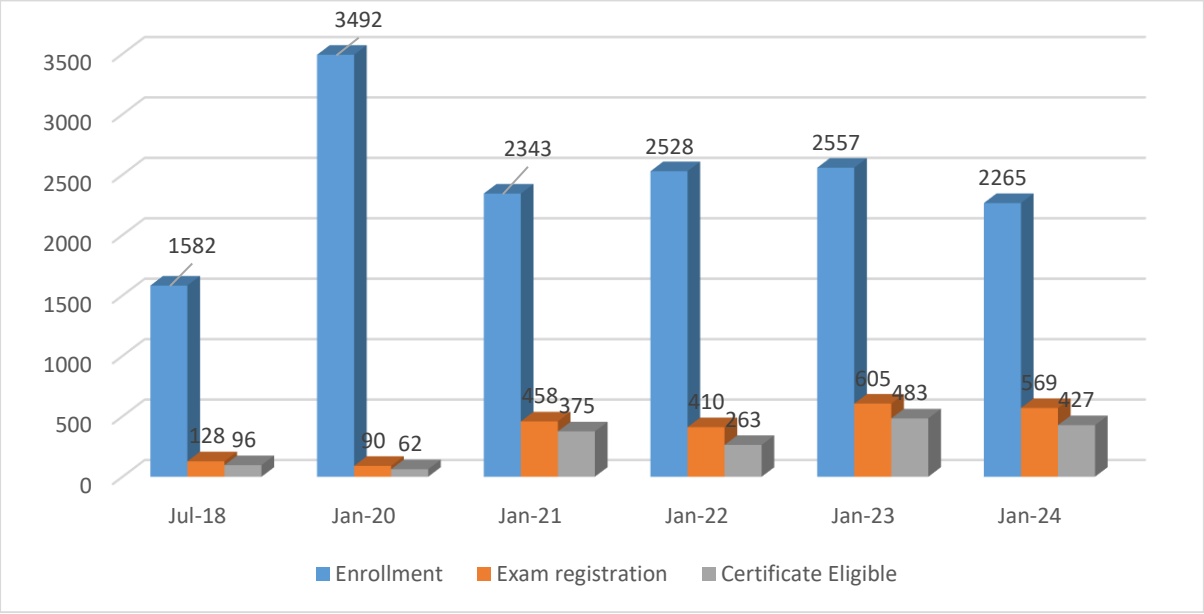
Prof. Rajshree Bedamatta
Humanities and Social Sciences

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

This course engages the student with the much-debated theories of growth versus development. The decades following liberalization and globalization have been a period of very high levels of economic inequality. With the focus on issues surrounding inequality, this course will introduce students to the major ideas and theories surrounding the often used and misused concepts of economic growth and economic development. With the help of major concepts used in growth and development economics, a student taking this course will be able to participate in the debate and understand the nuances surrounding the issue of economic development.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	1582	128	96
Jan-Mar 2020	Rerun	3492	90	62
Jan-Mar 2021	Rerun	2343	458	375
Jan-Mar 2022	Rerun	2528	410	263
Jan-Mar 2023	Rerun	2557	605	483
Jan-Mar 2024	Rerun	2265	569	427



Prof. S. Biswas
Computer Science and Engineering

Prof. A. Sarkar
Computer Science and Engineering

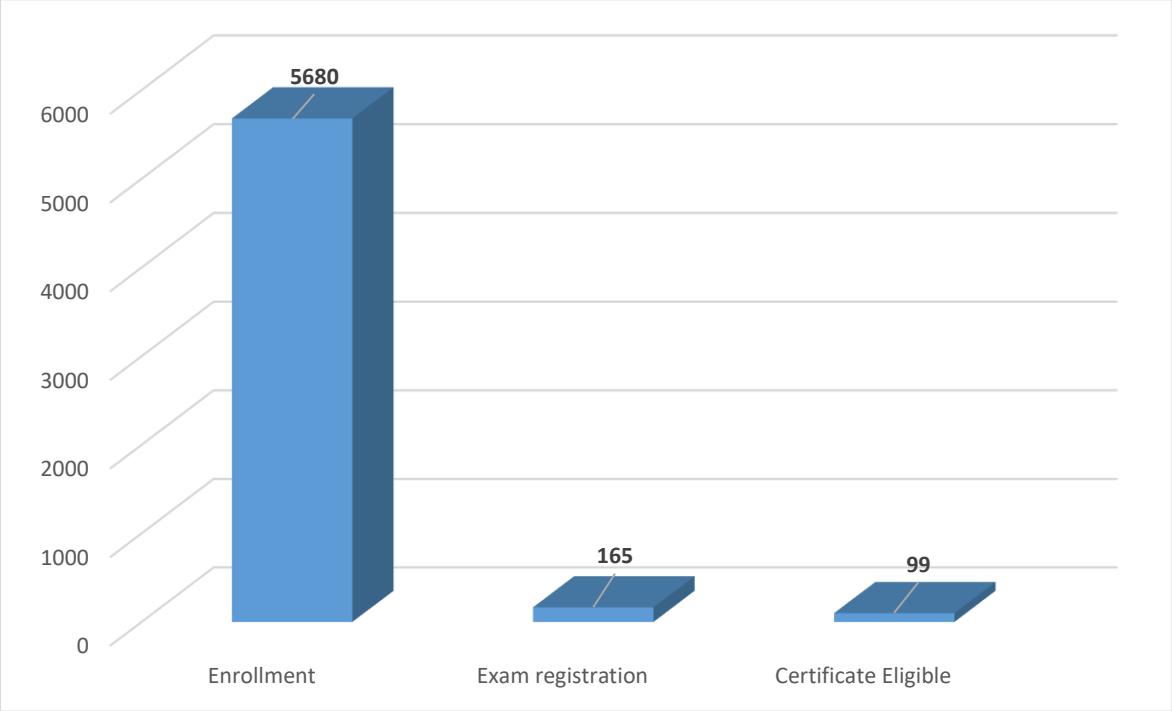
Prof. J. K. Deka
Computer Science and Engineering

Type of the course: New, July 2018 run Duration: 12 weeks

Course Outline:

An embedded system (ES) can be described as a computing system which is part of a larger physical system. Examples of ESs range from a simple elevator controller to a complex avionics control system. Unlike a general-purpose computer system, ESs are typically designed for specific functionalities, often with stringent performance objectives and constraints related to real-time accuracy, area, power, cost etc. Their implementations may include both software and hardware components and may necessitate integration with sensors and actuators. The increase in complexity of modern ESs mandates automation in their design. Given a system which we intend to implement, the design process majorly evolves through distinct but often overlapping and iterative phases which include, i. modeling of the intended system behavior, ii. design of appropriate structural representations and implementation methodologies, corresponding to the specified behavior, iii. verification and validation of the correctness and performance related properties that the designed system should satisfy, and iv. testing whether the prototyped / manufactured implementation actually performs the required behaviour. The proposed course will systematically cover all these topics so that the student gains an end-to-end understanding of the overall ES design process.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2018	New	5680	165	99



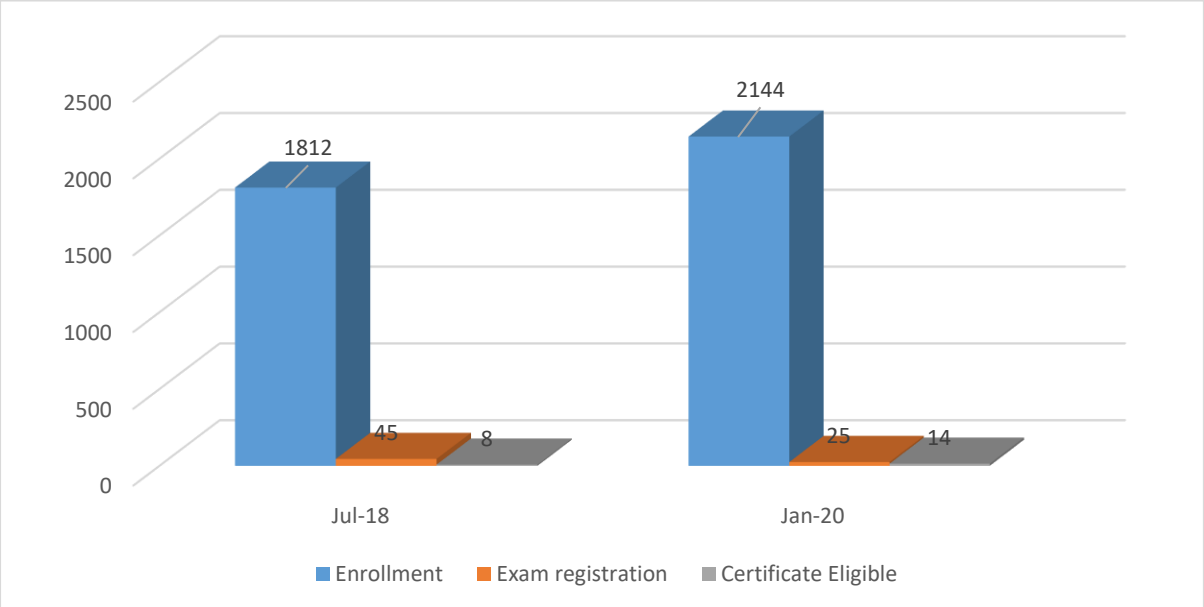
Prof. Ajay Dashora
Civil Engineering

Type of the course: New, July 2018 run Duration: 12 weeks

Course Outline:

Conventional survey techniques are all about measuring 2D or 3D coordinates of a point for mapping of a surface. Though accurate, these techniques are time consuming for topographic mapping. With development of various hard and soft technologies in last two decades, advanced mapping techniques have evolved. It gives a paradigm shift as conventional surveys are superseded by advanced surveying techniques, which are not only accurate and flexible but require minimum time to acquire large amount of 3D data. Therefore, these techniques have been extensively used in many areas of engineering by students, researchers, and industries. On the other hand, the fundamental concepts of most of the advanced surveying techniques are not clear to all users. This course on Higher Surveying discusses about the modern techniques of advanced surveying, their fundamental concepts, data acquisition, data processing, and applications.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2018	New	1812	45	8
Jan-Apr 2020	Rerun	2144	25	14



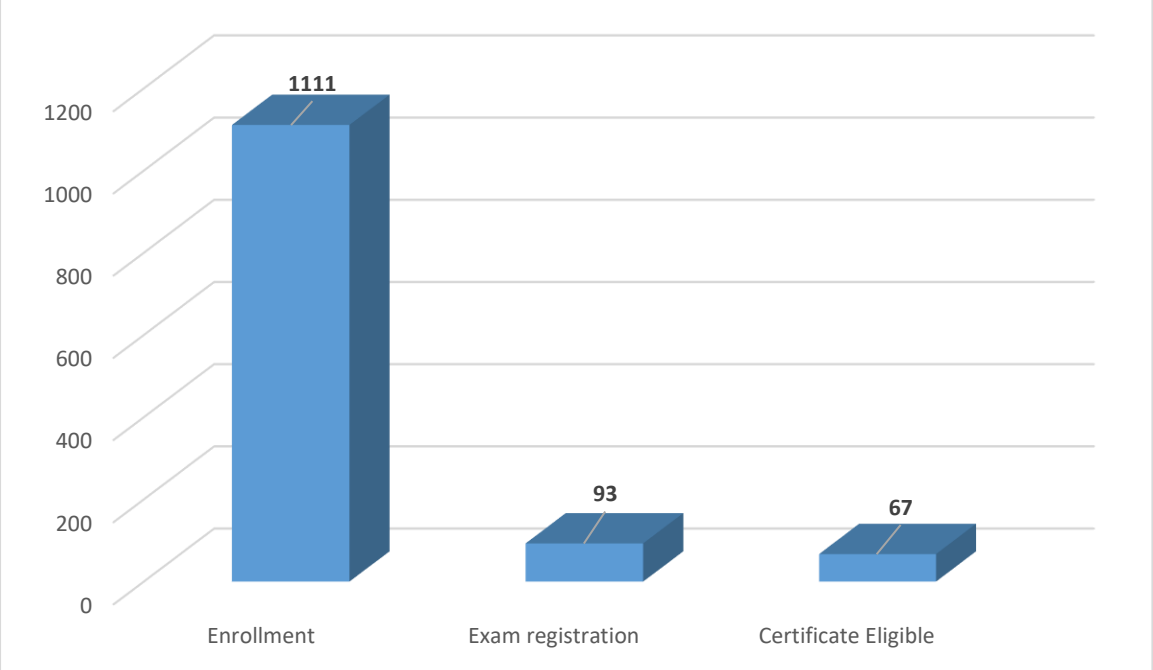
Prof. Abhishek Shrivastava
Design

Type of the course: New, July 2018 run Duration: 4 weeks

Course Outline:

The course addresses issues involved in the design of interactive products for specific user groups. The course content covers basic aspects of these designs including their user interfaces and interactions, their design process and its milestones, and evaluation of designs. A student interested in the design of interactive products and services would find this course useful.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	1111	93	67



Introduction to Abrasive Machining and Finishing Processes

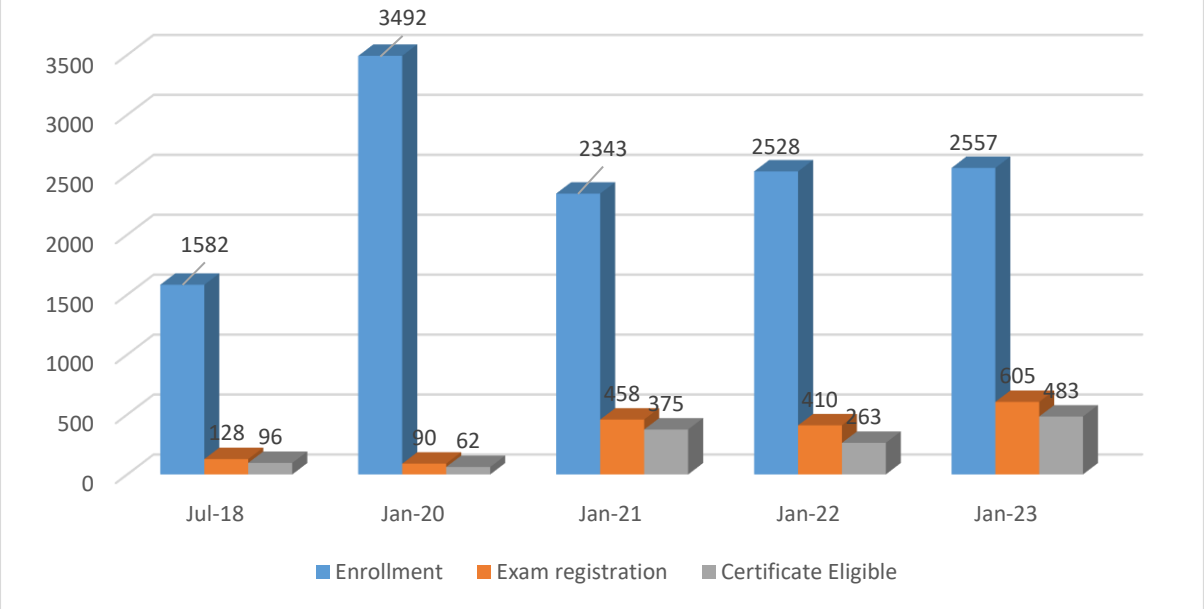
Prof. Mamilla Ravi Sankar
Mechanical Engineering

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

This course will define the areas of application of traditional as well as non-traditional abrasive finishing processes in the manufacturing industry. The lectures will introduce the basic principles of material removal by use of abrasives particles and material removal mechanism of different abrasive process. The effects of various input parameters on the outputs as well as the use of cutting fluids in various finishing process will be discuss. A variety of numerical problems and MCQs, discussions will also be included.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2517	689	583
Jan-Mar 2020	Rerun	1100	67	53
Jan-Mar 2021	Rerun	441	79	66
Jan-Mar 2022	Rerun	926	456	363
Jan-Mar 2023	Rerun	708	214	163



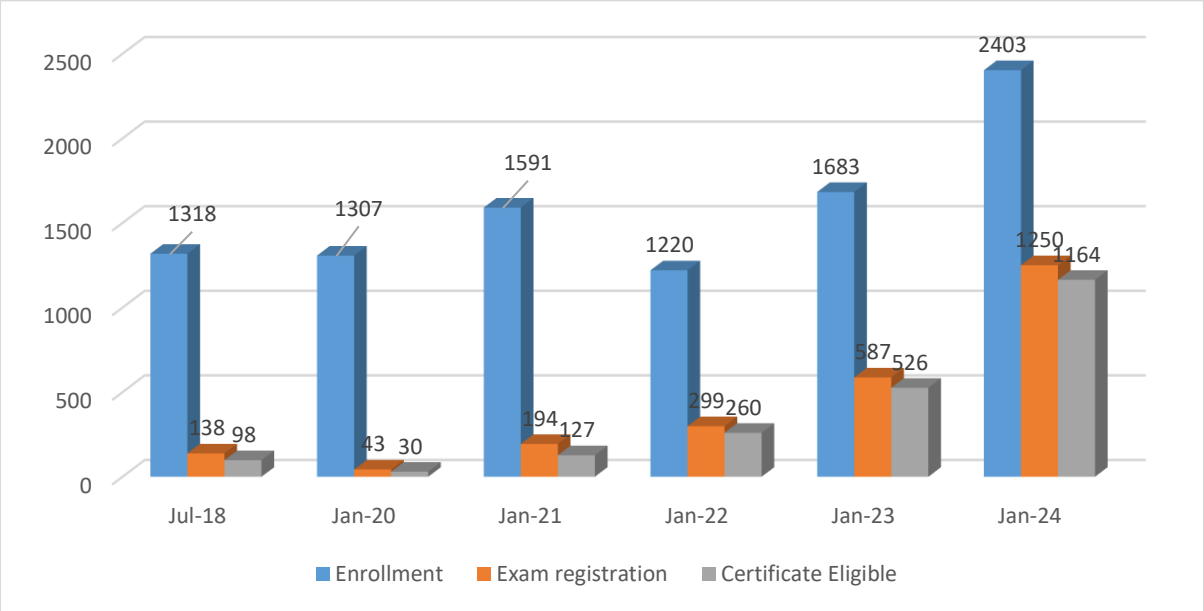
Prof. Mithilesh Kumar Jha
Humanities and Social Sciences

Type of the course: New, July 2018 run Duration: 12 weeks

Course Outline:

Modern Indian political thought is one of the fascinating areas of scholarly debates and discussions in contemporary India. It also signifies a shift away from excessive reliance upon Eurocentric views, methods and concepts to study and interpret Indian society and its politics. The major objective of this course is to introduce the students to some of the key modern Indian thinkers and their ideas which helped in shaping the society and politics of modern India.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2018	New	1318	138	98
Jan-Apr 2020	Rerun	1307	43	30
Jan-Apr 2021	Rerun	1591	194	127
Jan-Apr 2022	Rerun	1220	299	260
Jan-Apr 2023	Rerun	1683	587	526
Jan-Apr 2024	Rerun	2403	1250	1164



Introduction to Polymer Physics

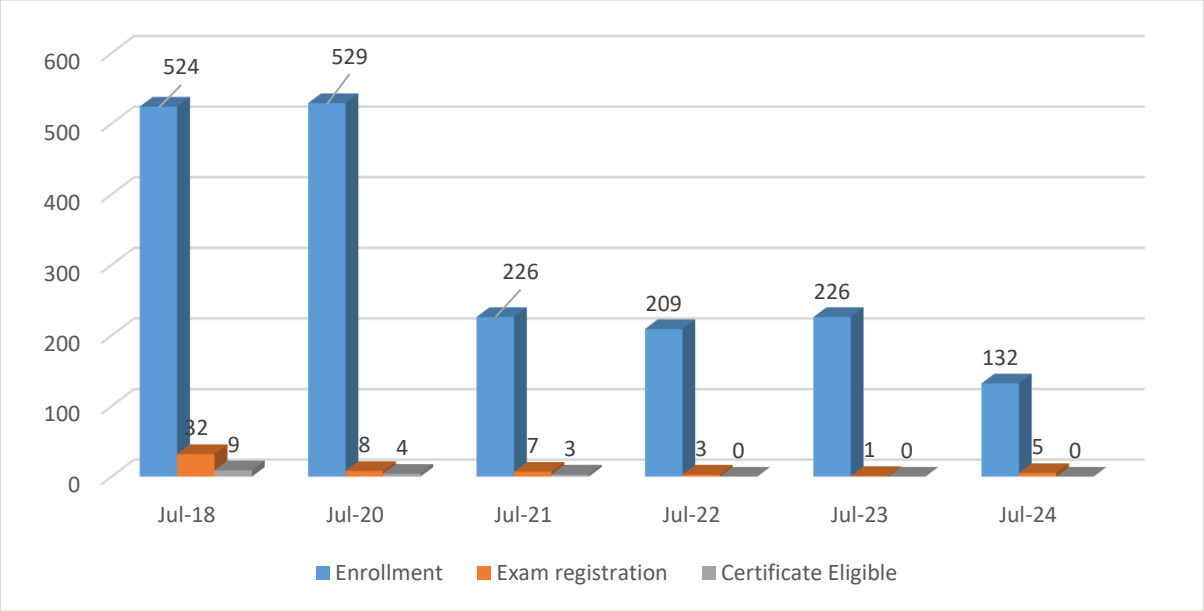
Prof. Amit Kumar
Chemical Engineering

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

Polymer physics is important to understand the structure-property relation in polymers. An understanding of the structural features and interactions responsible for polymer properties can aid in tuning the desirable properties. This introductory course will discuss the models for ideal polymer chains, and thermodynamics of polymer solutions and blends, focusing on miscibility. The course will also cover the different methods to measure polymer molar mass, which has a strong effect on polymer properties. The physics of branching and network formation will be introduced with reference to branched polymers, dendrimers and cross-linked polymers. The course will also discuss mechanical properties of polymers with focus on viscoelasticity and rubber elasticity. Finally, a brief introduction to polymer dynamics will be provided.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	524	32	9
Sep-Nov 2020	Rerun	529	8	4
Jul-Sep 2021	Rerun	226	7	3
Jul-Dec 2022	Rerun	209	3	0
Jul-Oct 2023	Rerun	226	1	0
Jul-Oct 2024	Repeat	132	5	0



Prof. Uday S. Dixit
Mechanical Engineering

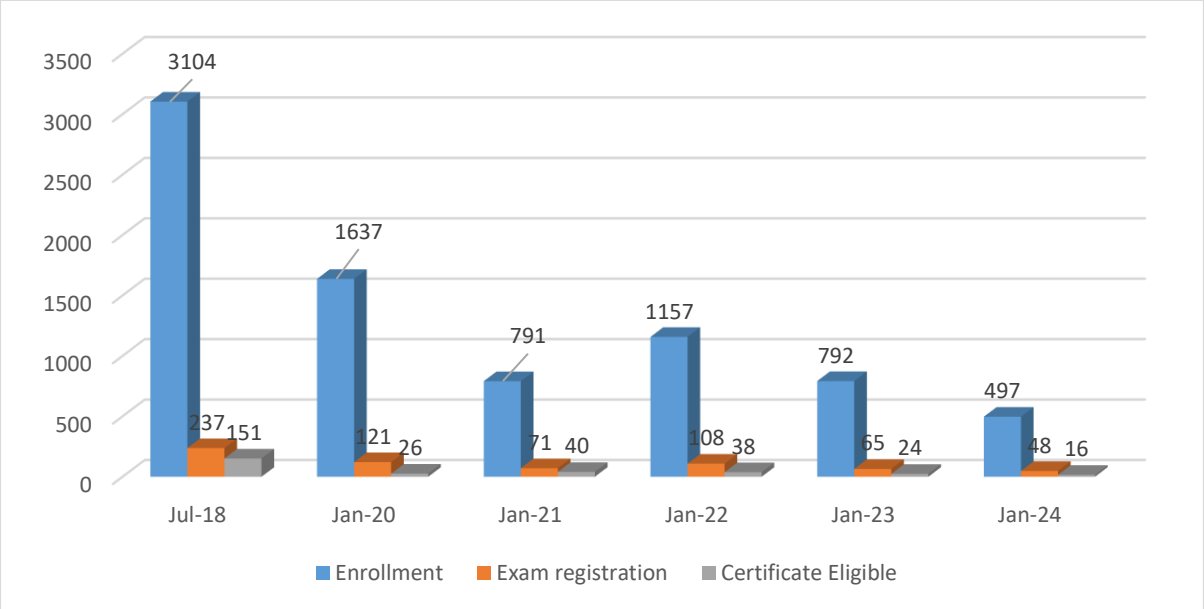
Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

In this course an attempt is made to standardize the course material and to emphasize on the fundamental mechanics of machining process using analytical approach. The changing of raw material into a final product involves various machining and finishing processes. In the last decade, a lot of development has taken place in the area of non-traditional machining and many non-traditional machining processes have become very popular in industries. However, the importance of traditional machining processes like turning, milling, shaping, drilling, and grinding still

continues. The course is developed with a view to disseminate knowledge in the area of traditional machining processes. Also, newer technology like CNC is included. This course aims at bringing the students up-to-date with the latest technological developments and research trends in the field of conventional machining processes.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	3104	237	151
Jan-Mar 2020	Rerun	1637	121	26
Jan-Mar 2021	Rerun	791	71	40
Jan-Mar 2022	Rerun	1157	108	38
Jan-Mar 2023	Rerun	792	65	24
Jan-Mar 2024	Rerun	497	48	16



Multi-Core Computer Architecture- Storage and Interconnects

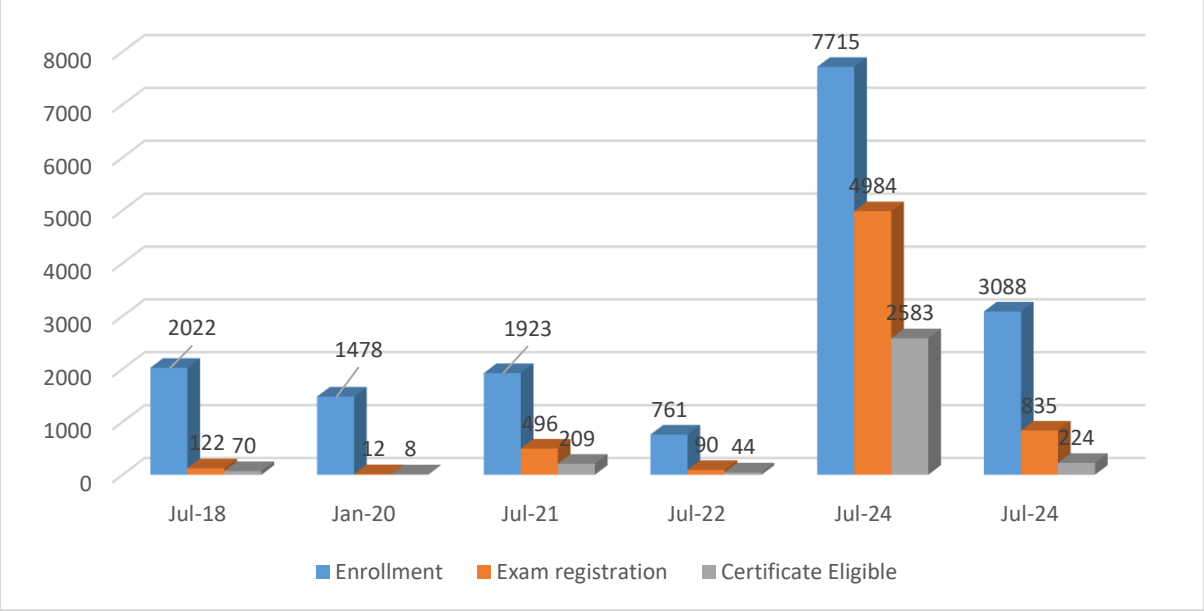
Prof. John Jose
Computer Sciences and Engineering

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

We are in the era of multi-core systems where even the simplest of handheld devices like a smart phone houses many processors in a single chip. The core counts are ever increasing from 8 to 10 in smart phones to over 100s in super computers. This course will introduce the students to the world of multi-core computer architectures. With the unprecedented growth of data science, on-chip storage systems and inter-core communication framework are getting equal attention as that of processors. This course will focus on delivering an in-depth exposure in memory-subsystems and interconnects of Tiled Chip Multi-Core Processors with few introductory sessions on advanced superscalar processors. The course concludes with pointers to current research standings and on-going research directions for motivating the students to explore further.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2022	122	70
Feb-Apr 2020	Rerun	1478	12	8
Aug-Oct 2021	Rerun	1923	496	209
Jul-Dec 2022	Rerun	761	90	44
Jul-Oct 2023	Rerun	7715	4984	2583
Jul-Oct 2024	Rerun	3088	835	224



Natural Gas Engineering

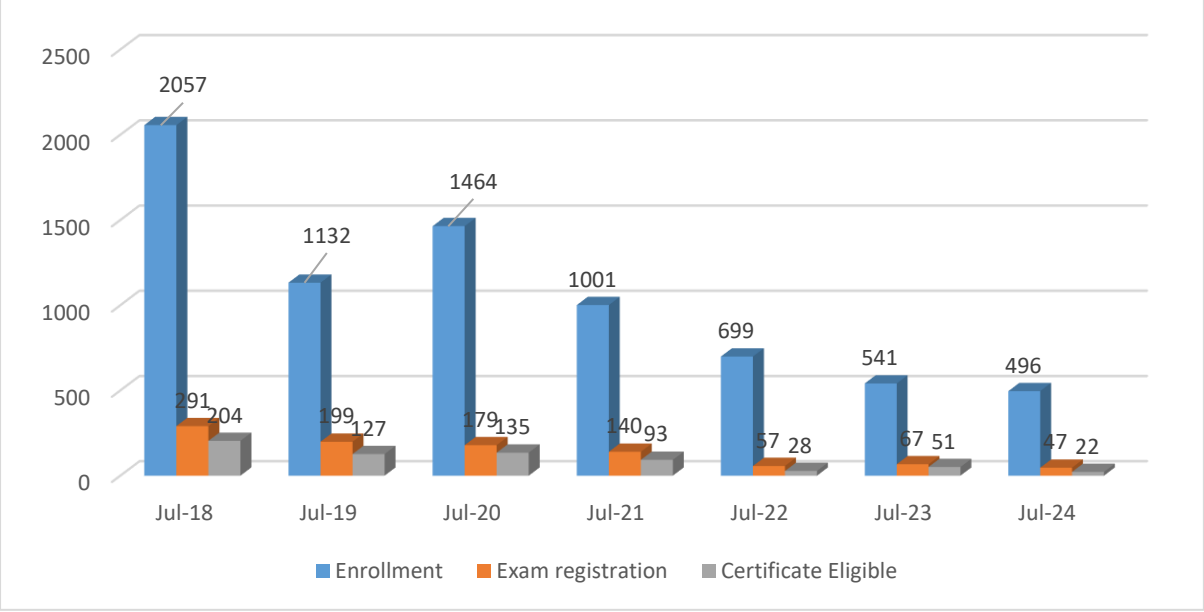
Prof. Pankaj Tiwari
Chemical Engineering

Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

The field of natural gas engineering is very much important for petroleum engineers specializing in gas processing technology. The course outlines an optimal balance between natural gas production, natural gas processing and gas transportation. An extensive treatise on natural gas engineering, both upstream and gas refining processes with key equipment and facility design will be covered. This course will also highlight the current status of production of natural gas through unconventional sources/technics and the applications of natural gas.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2057	291	204
Jul-Sep 2019	Rerun	1132	199	127
Sep-Nov 2020	Rerun	1464	179	135
Jul-Sep 2021	Rerun	1001	140	93
Jul-Dec 2022	Rerun	699	57	28
Jul-Sep 2023	Rerun	541	67	51
Jul-Sep 2024	Rerun	496	47	22



Principle of Hydraulic Machines and System Design

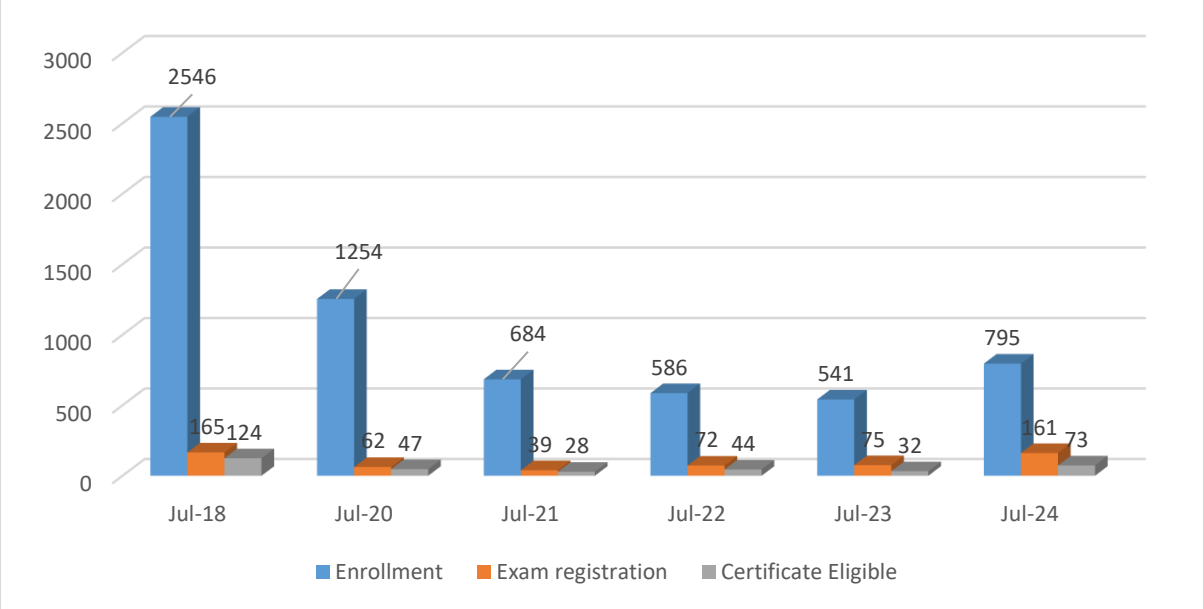
Prof. Pranab K. Mondal
Mechanical Engineering

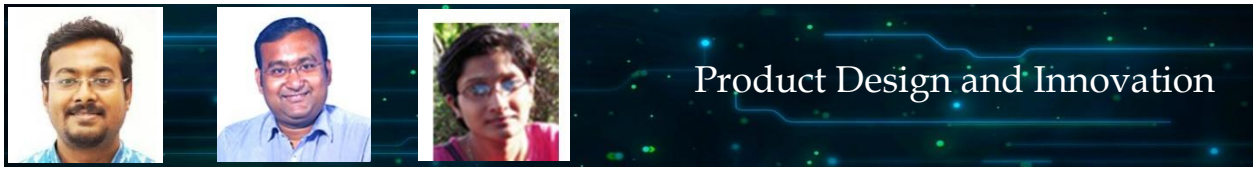
Type of the course: New, July 2018 run Duration: 8 weeks

Course Outline:

Principle of operation of hydraulic machines and their system design is important from the perspective of their huge applications in different industries. Present course introduces the students to the fundamentals of hydraulic machines. Starting from the operational principle, students will be gradually familiarized with different concepts like velocity triangle, net head developed, finally leading to the design of their system. Important topics such as design of pumping system of two dissimilar pumps, which find practical relevance as well, will also be discussed.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	2546	165	124
Sep-Nov 2020	Rerun	1254	62	47
Jul-Oct 2021	Rerun	684	39	28
Jul-Dec 2022	Rerun	586	72	44
Jul-Oct 2023	Rerun	541	75	32
Jul-Oct 2024	Repeat	795	161	73





Prof. Supradip Das
Design

Prof. Debayan Dhar
Design

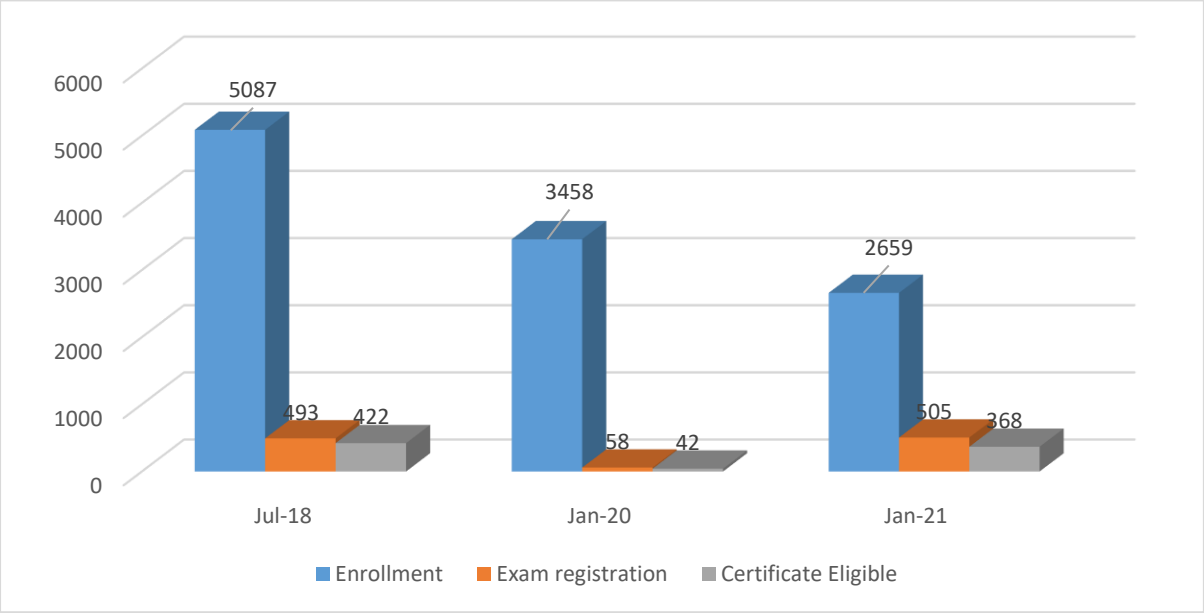
Prof. Swati Pal
Design

Type of the course: New, July 2018 run Duration: 4 weeks

Course Outline:

Product Design and Innovation course is intended to introduce overall awareness of the product design process. This course will give an understanding of methods, tools and techniques applied in product design. This course includes overview of innovation, product design process, user study, need/problem identification, development of design brief, understanding competitive benchmarking, aspects of human factors in product design, tools for creative concept generation, prototyping/model making and evaluation techniques for user-product interaction. This course will be explained with lectures including case studies and hands-on exercises. This will help students to generate creative ideas in to product design, considering human factors aspects.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	5087	493	422
Jan-Feb 2020	Rerun	3458	58	42
Jan-Feb 2021	Rerun	2659	505	368

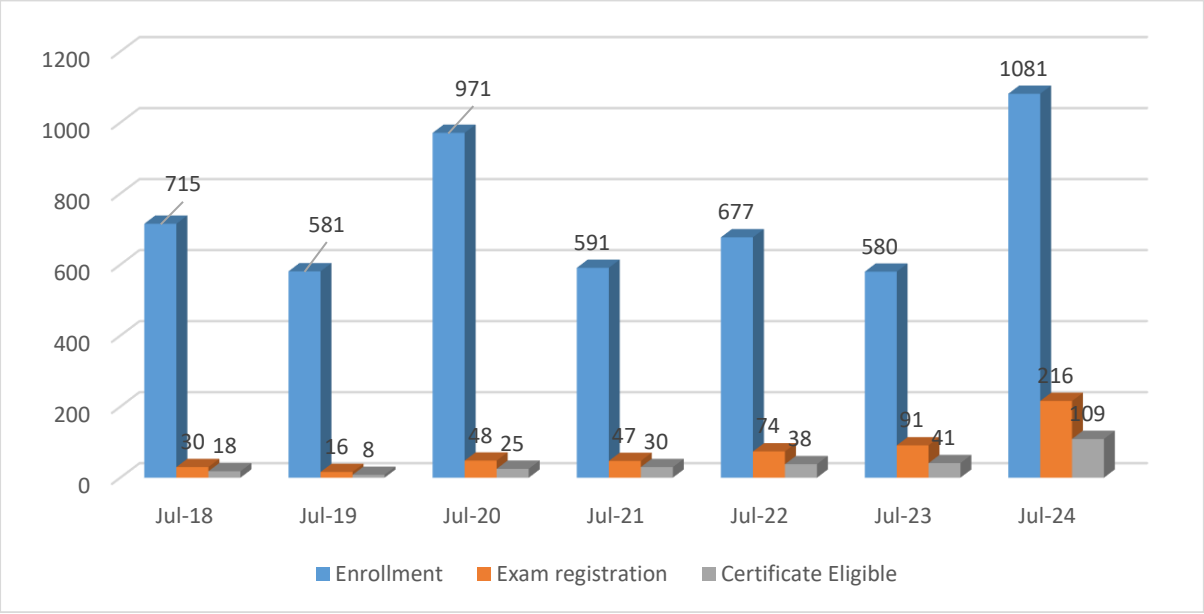


Prof. Sharmistha Banerjee
Design

Type of the course: New, July 2018 run Duration: 12 weeks

Course Outline:
Design for Sustainability is a design thinking process for widening the boundaries of the objective of design so as to contribute positively to sustainable development. It encompasses four approaches: 1. Selection of resources with low environmental impact; 2. Design of products with low environmental impact; 3. Product-Service System Design for eco-efficiency; 4. Design for social equity and cohesion. This course will discuss these Design approaches, methods and tools along with case examples.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2018	New	715	30	18
Jul-Oct 2019	Rerun	581	16	8
Sep-Dec 2020	Rerun	971	48	25
Jul-Oct 2021	Rerun	591	47	30
Jul-Dec 2022	Rerun	677	74	38
Jul-Oct 2023	Rerun	580	91	41
Jul-Oct 2024	Repeat	1081	216	109



Theory of Rectangular Plates -Part1

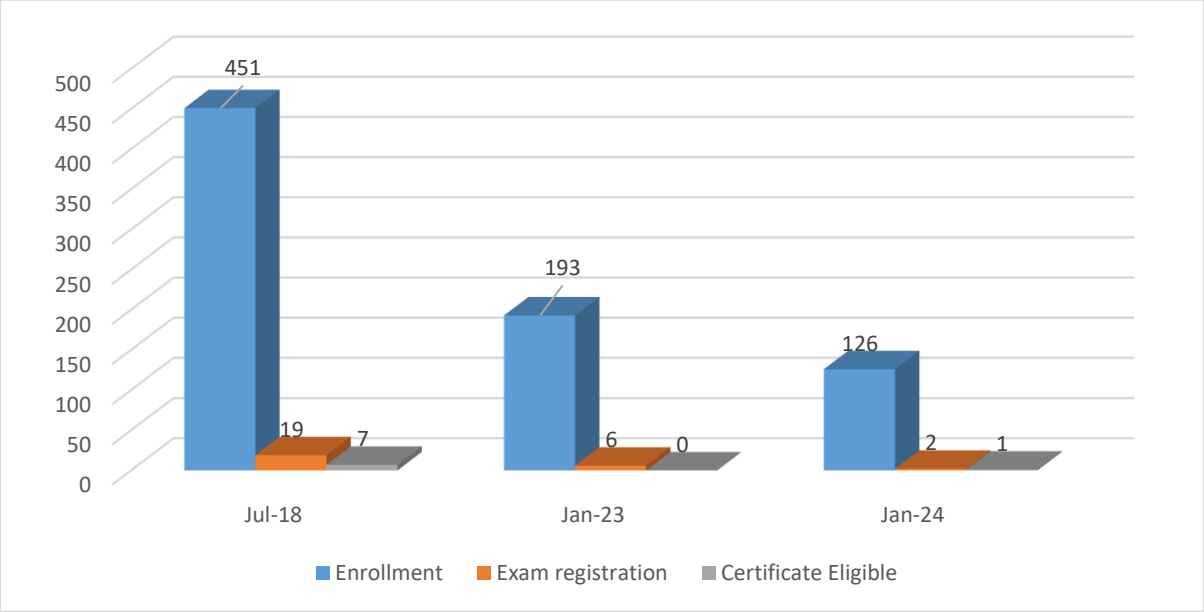
Prof. Poonam Kumari
Mechanical Engineering

Type of the course: New, July 2018 run Duration: 4 weeks

Course Outline:

Beams, plates and shells are fundamental structural elements in the field of mechanical engineering, civil structures, automobile and aerospace engineering. Therefore, analysis of these basic structural elements is required for design and development. This course presents systematic development of plate governing equations using the vibrational calculus. Basic analytical solutions techniques are discussed for bending, free vibration and buckling cases. Further this approach can be applied to develop governing equation and solutions for functionally graded plate, piezoelectric plates (current research topics).

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2018	New	451	19	7
Jan-Apr 2023	Rerun	193	6	0
Jan-Apr 2024	Repeat	126	2	1



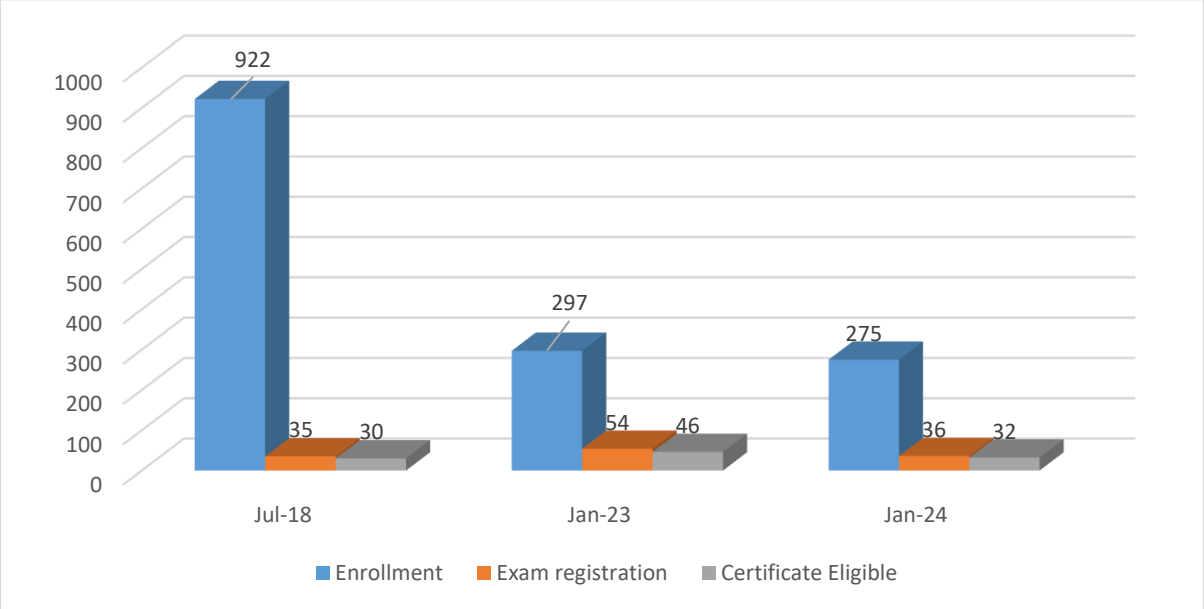
Prof. T. V. Bharat
Civil Engineering

Type of the course: New, July 2018 run Duration: 12 weeks

Course Outline:

The knowledge of soil behavior is very important in the Geotechnical engineering practice. The soil behavior in saturated state is widely taught in the undergraduate and graduate programs, all over. The existence of air-phase in natural soils prompts the soil to behave differently from the saturated soils. The present course would provide the fundamental principles, mechanisms, and behavior of partly saturated soils.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2018	New	922	35	30
Jan-Apr 2023	Rerun	297	54	46
Jan-Apr 2024	Repeat	275	36	32



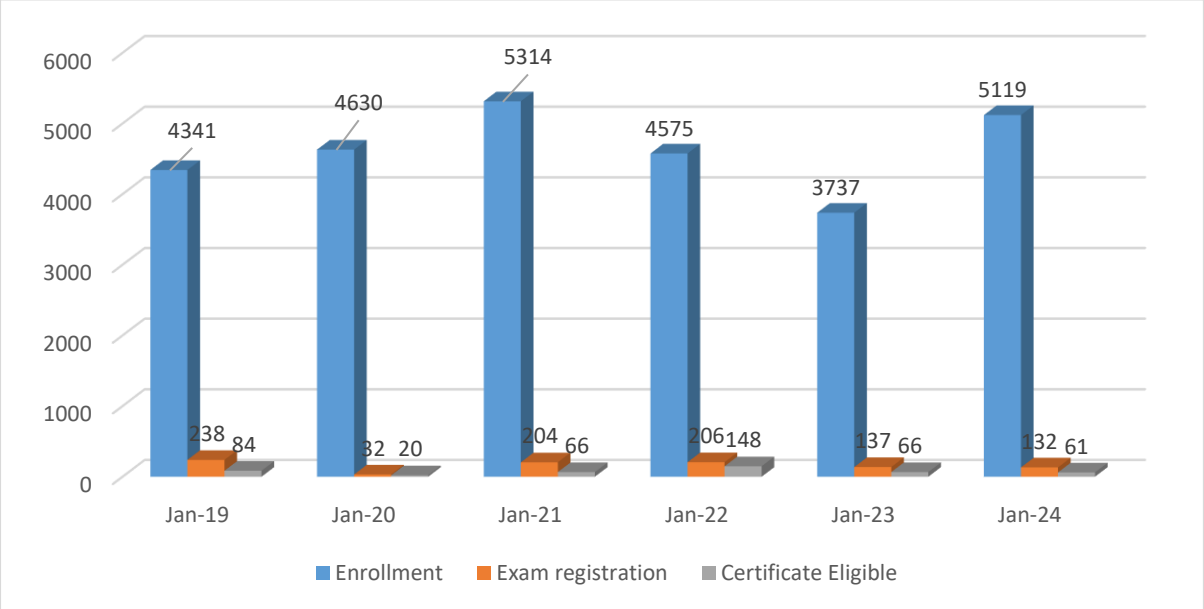
Prof. Saurabh Basu
Physics

Type of the course: New, Jan 2019 run Duration: 4 weeks

Course Outline:

The course deals with the basics of superconductivity, including Meissner effect, electrodynamic response, -Type-I and type-II superconductors etc. BCS theory, the only microscopic theory of superconductivity is discussed in details with a view to understand superconducting transition temperature and its relation to the pairing gap. Further Ginzburg Landau theory is introduced which is a phenomenological theory that is applicable in general to second order phase transitions. A few experimental methods to explore the superconducting gap are discussed. Unconventional superconductivity is elaborately talk about with regard to the unusual normal phase of the high Tc cup rates and ramification due to the breakdown of Landau's Fermi liquid theory therein is emphasized. Finally, Josephson effect is introduced and its applications to superconducting circuits are studied. Special emphasis is given to DC SQUID which uses Josephson junctions and has a variety of applications, such as sensors, amplifiers, magnetometers etc.

Timeline	Type	Enrolled	Registered	Certified
Feb-Mar 2019	New	4341	238	84
Jan-Feb 2020	Rerun	4630	32	20
Jan-Feb 2021	Rerun	5314	204	66
Jan-Feb 2022	Rerun	4575	206	148
Jan-Mar 2023	Rerun	3737	137	66
Jan-Mar 2024	Rerun	5119	132	61



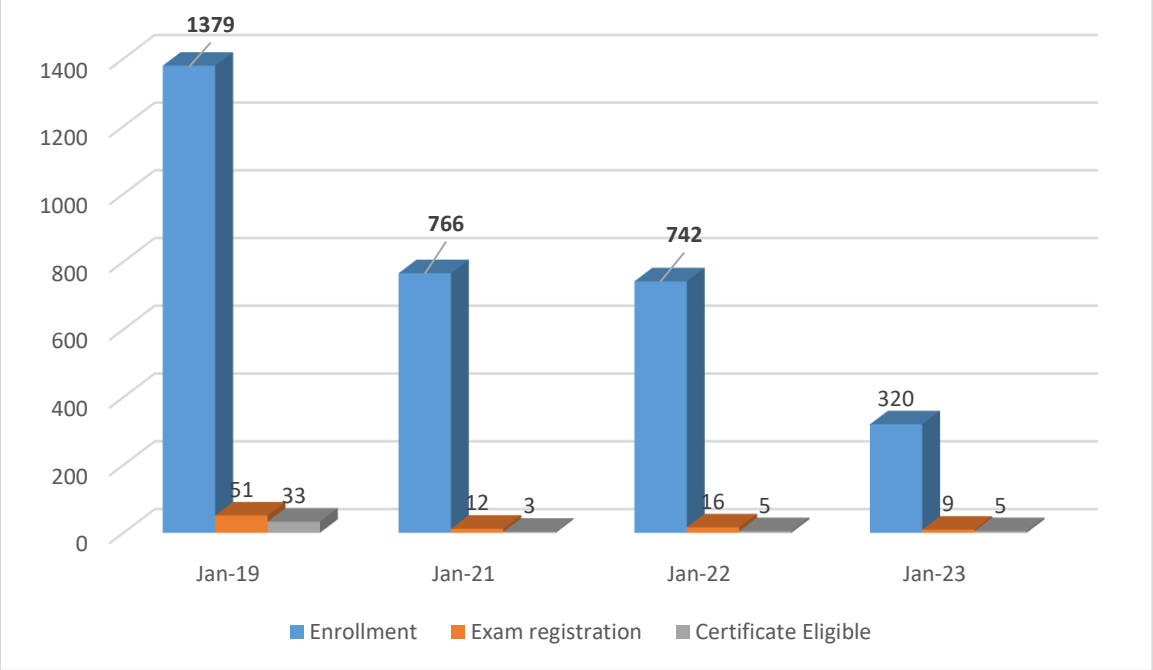
Prof. Sasidhar Gumma
Chemical Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

This course will deal with evaluation and application of the laws of thermodynamics with respect to physical and chemical processes. Real gas behavior, solution thermodynamics, phase and reaction equilibria will be discussed. It will lay foundation for other chemical engineering courses such as mass transfer, chemical reaction engineering etc. It will demonstrate the application of the fundamental concepts of thermodynamics to a wide variety of processes occurring in Chemical Engineering. It will enable the students to develop skills necessary to make appropriate assumptions in specific Chemical Engineering problems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	1379	51	33
Jan-Apr 2021	Rerun	766	12	3
Jan-Apr 2022	Rerun	742	16	5
Jan-Apr 2023	Rerun	320	9	5



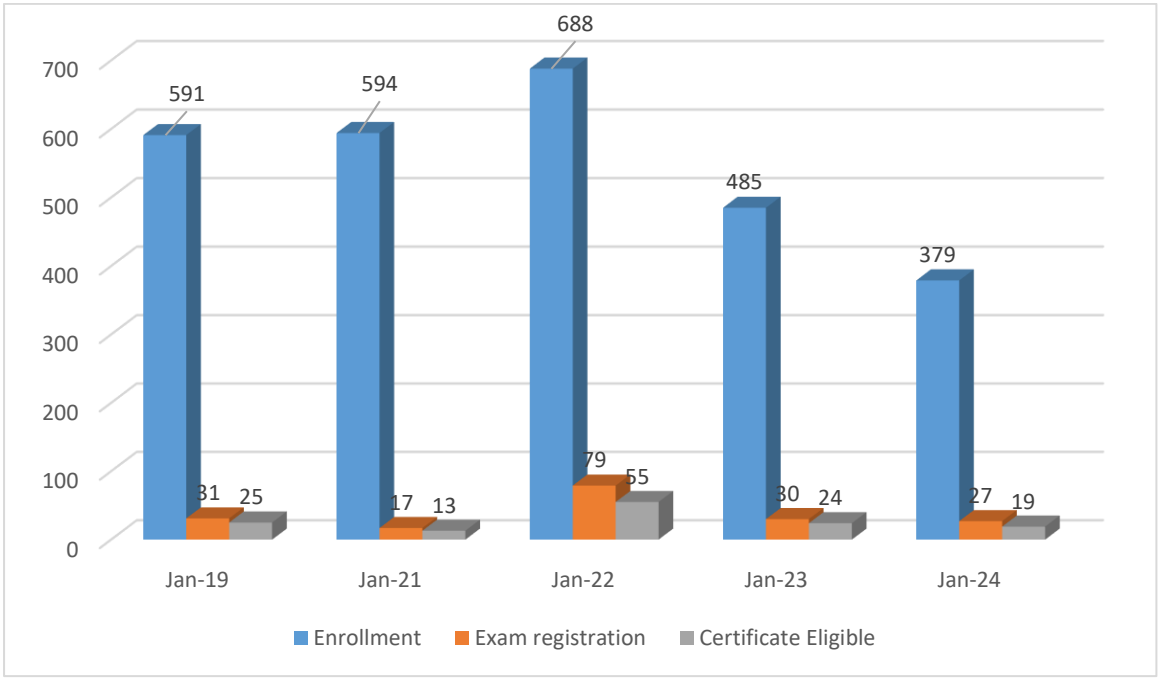
Prof. Subrata Kumar Majumder
Chemical Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

This course is structured as a MOOCS course for students or junior engineers studying chemical, mechanical or civil engineering. In this course, effort is made to introduce students /engineers to fluid mechanics by making explanations easy to understand. The following features will be included in the course 1. Examples, photographs and items of interest will be presented for easy understanding. 2. Assignments and exercises will be given at the ends of course lecture to test understanding of the chapter topic. 5. Special emphasis will be given on real multiphase flow phenomena with specific applications.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	591	31	25
Jan-Apr 2021	Rerun	594	17	13
Jan-Apr 2022	Rerun	688	79	55
Jan-Apr 2023	Rerun	485	30	24
Jan-Apr 2024	Rerun	379	27	19



Fundamental of Welding Science and Technology

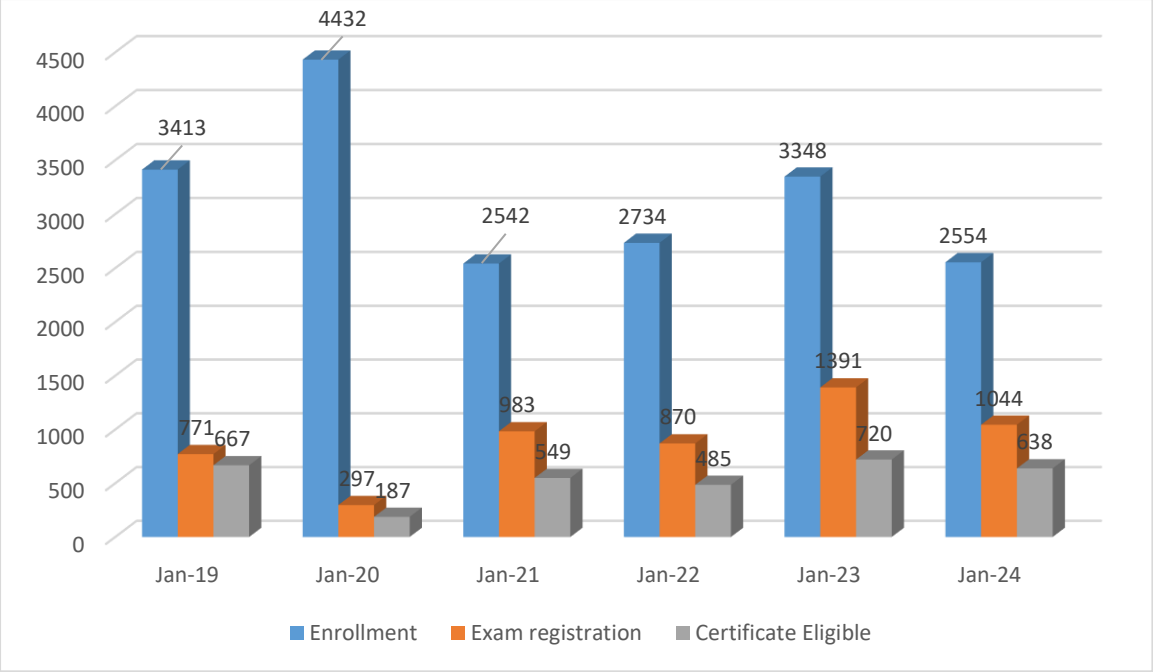
Prof. Pankaj Biswas
Mechanical Engineering

Type of the course: New, Jan 2019 run Duration: 8 weeks

Course Outline:

Dr. Pankaj Biswas going to offer a course on Fundamental of Welding Science and Technology under the MOOCS program of the MHRD. As the name implies in this course he will try to cover the fundamental overview of the traditional/ industrial welding technology especially those welding processes which are widely used in manufacturing industries. This will help the participants to understand and apply this knowledge of welding in practice for various industrial applications. It will also encourage academic participants to increase the research interest in the field of welding. Welding is a joining process which is an unavoidable technology in most of the manufacturing sector. It is such a topic in which you will get the taste of most of the science and engineering subjects. Knowledge of almost all science subjects like physics, chemistry, mathematics and engineering subjects like solid mechanics, thermal science, fluid mechanics etc. are highly essential to understand the area welding technology. It is observed that in manufacturing industry over 30 % expenditure is spent on welding. Welding has significant application in various manufacturing sectors like aerospace, automobile, ship building, railway etc. It plays very important and crucial role in service life of the structure. That's why basic fundamental knowledge of welding is highly essential. The brief overview of the course content can be stated like; this course will cover the classification of welding process, classification of welding joints, industrial relevance of welding, welding symbols, characteristics of traditional welding power sources. It will give the fundamental knowledge of principle and physics involve in various welding processes. It will also cover the importance and applications of different traditional welding techniques. This course will highlight safety precautions to be followed in welding. This course will also cover welding defects & inspection and with their remedies to improve the weld quality.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2019	New	3413	771	667
Jan-Mar 2020	Rerun	4432	297	187
Jan-Mar 2021	Rerun	2542	983	549
Jan-Mar 2022	Rerun	2734	870	485
Jan-Mar 2023	Rerun	3348	1391	720
Jan-Mar 2024	Rerun	2554	1044	638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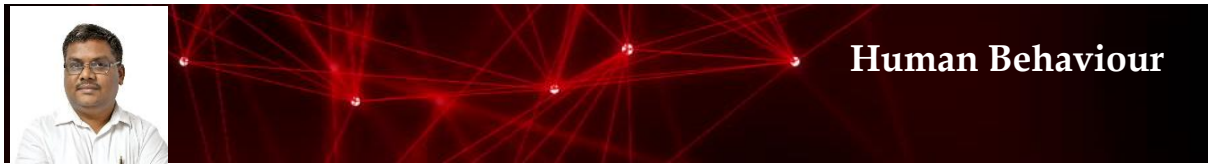
Enrollment
Exam registration
Certificate Eligible



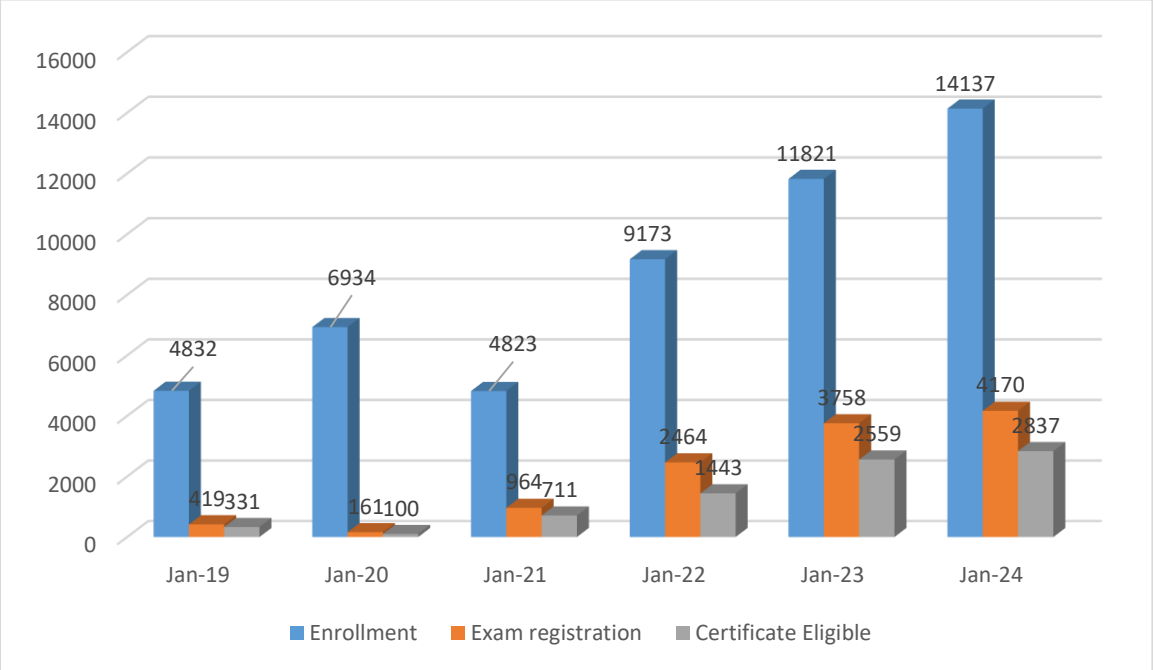
Prof. Naveen Kashyap
Humanities and Social Sciences

Type of the course: New, Jan 2019 run Duration: 8 weeks

Course Outline:

We as intelligent beings have always wondered why we do what we do. The most interesting knowledge that humans' beings would kill to possess would be the knowledge to control other people. The basic premise of being human is individual difference (we are all different). One science that helps people in understanding other people and scientifically predicting their actions is the science of psychology. In the present course, I will make an attempt to simplify the science of human behavior.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2019	New	4832	419	331
Jan-Mar 2020	Rerun	6934	161	100
Jan-Mar 2021	Rerun	4823	964	711
Jan-Mar 2022	Rerun	9173	2464	1443
Jan-Mar 2023	Rerun	11821	3758	2559
Jan-Mar 2024	Rerun	14137	4170	2837



Prof. Pranab K. Mondal
Mechanical Engineering

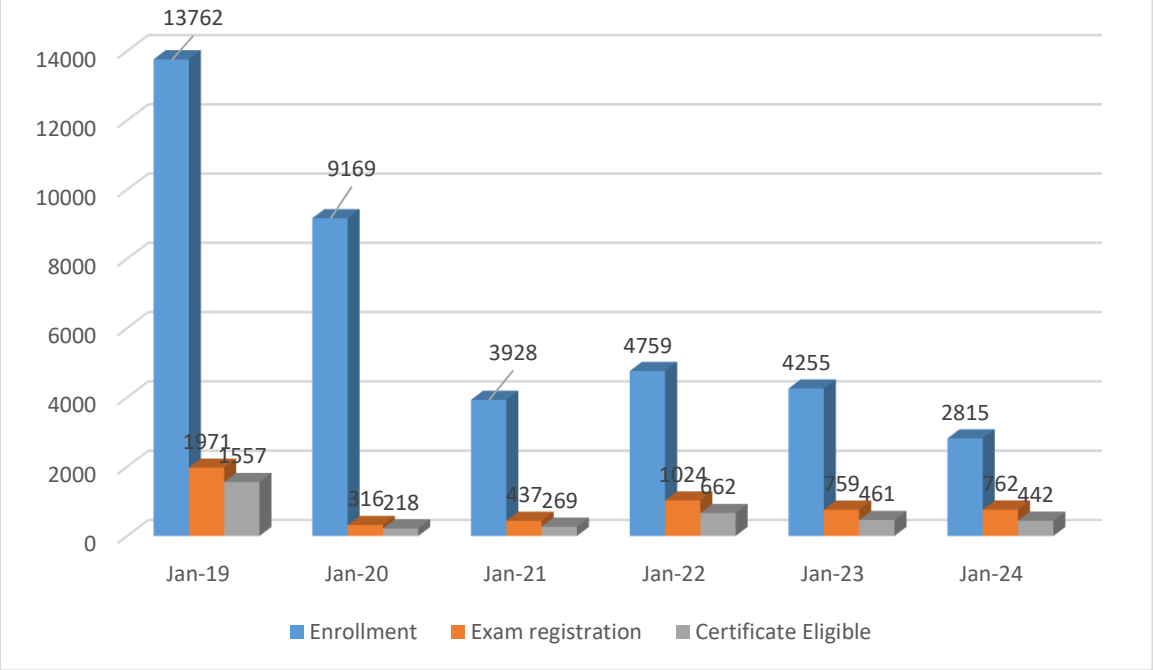
Prof. Vinayak N. Kulkarni
Mechanical Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

This course deals with the gas power cycles. One part of the course is on IC engines and it focuses on the thermodynamic cycles for die rent fuels suitable for automobiles. Other part of the course has emphasis on thermodynamic cycle of aircraft engines and the components of the aircraft engine. Thus, this course would provide an understanding on electricity generation or transportation application using gas as working medium.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	13762	1971	1557
Jan-Apr 2020	Rerun	9169	316	218
Jan-Apr 2021	Rerun	3928	437	269
Jan-Apr 2022	Rerun	4759	1024	662
Jan-Apr 2023	Rerun	4255	759	461
Jan-Apr 2024	Rerun	2815	762	442



Introduction to Modern Indian Drama

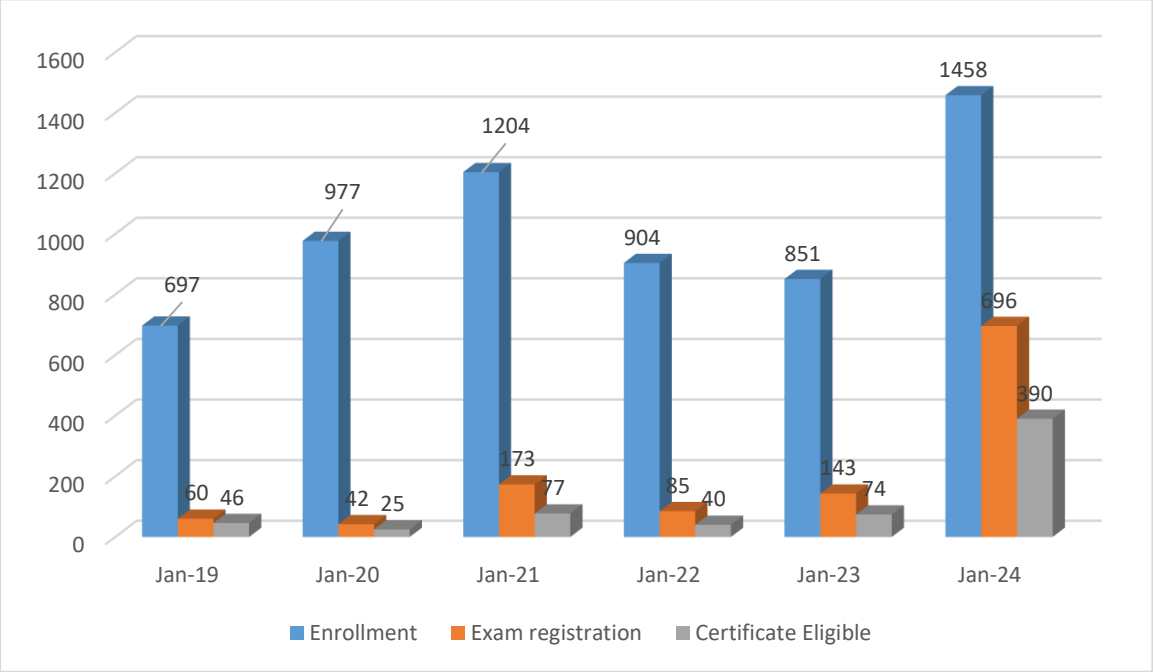
Prof. Kiran Keshavamurthy
Humanities and Social Sciences

Type of the course: New, Jan 2019 run Duration: 8 weeks

Course Outline:

This course introduces students to the historical and social debates on modern Indian theatre from the latter decades of the 19th century to the mid-20th century. The purpose of the course is to familiarize students with modern Indian performance traditions and the social and political issues in the works of major modern Indian playwrights.

Timeline	Type	Enrolled	Registered	Certified
Feb-Apr 2019	New	697	60	46
Feb-Apr 2020	Rerun	977	42	25
Feb-Apr 2021	Rerun	1204	173	77
Feb-Apr 2022	Rerun	904	85	40
Jan-Apr 2023	Rerun	851	143	74
Jan-Apr 2024	Rerun	1458	696	390



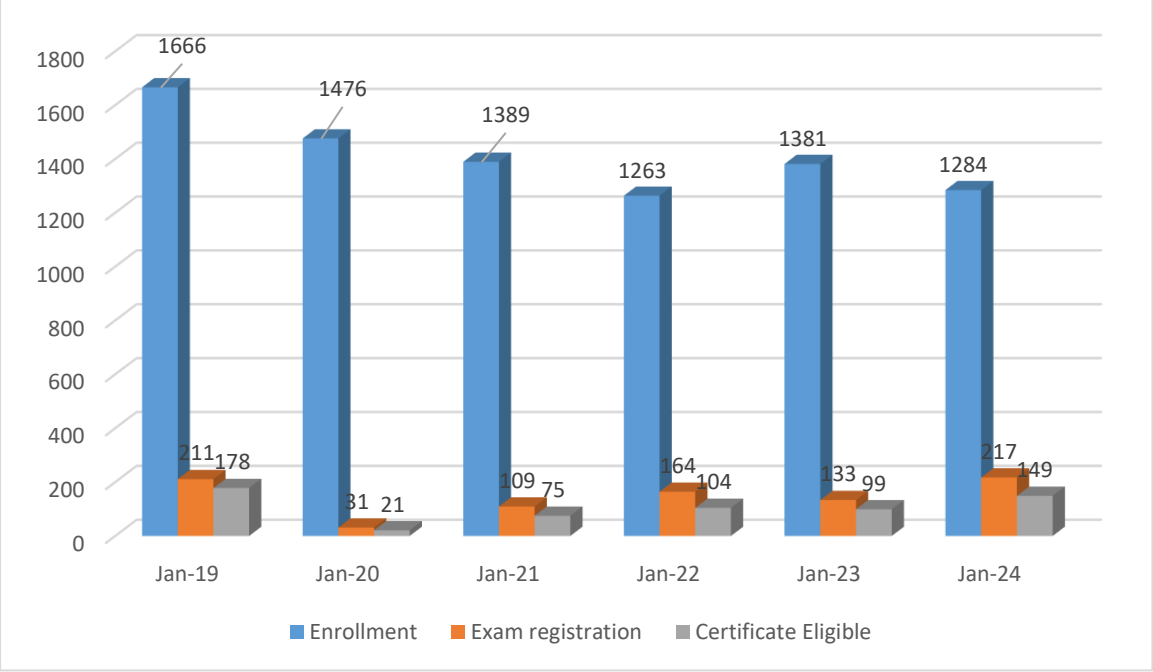
Prof. Mithilesh Kumar Jha
Humanities and Social Sciences

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

The major objective of this course is to introduce the students to some of the key concepts and ideas of politics which shape our political discourse. These concepts are essentially contested concepts and yet inevitable for understanding and explaining the politics of any country or society. A clear understanding of these debates or contestations over some of the key concepts and ideas of politics, it is hoped, will help the students develop their own independent views and judgments about politics and democracy in their own societies as well as in the world at large.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	1666	211	178
Jan-Apr 2020	Rerun	1476	31	21
Jan-Apr 2021	Rerun	1389	109	75
Jan-Apr 2022	Rerun	1263	164	104
Jan-Apr 2023	Rerun	1381	133	99
Jan-Apr 2024	Rerun	1284	217	149



Mass Transfer Operations -I

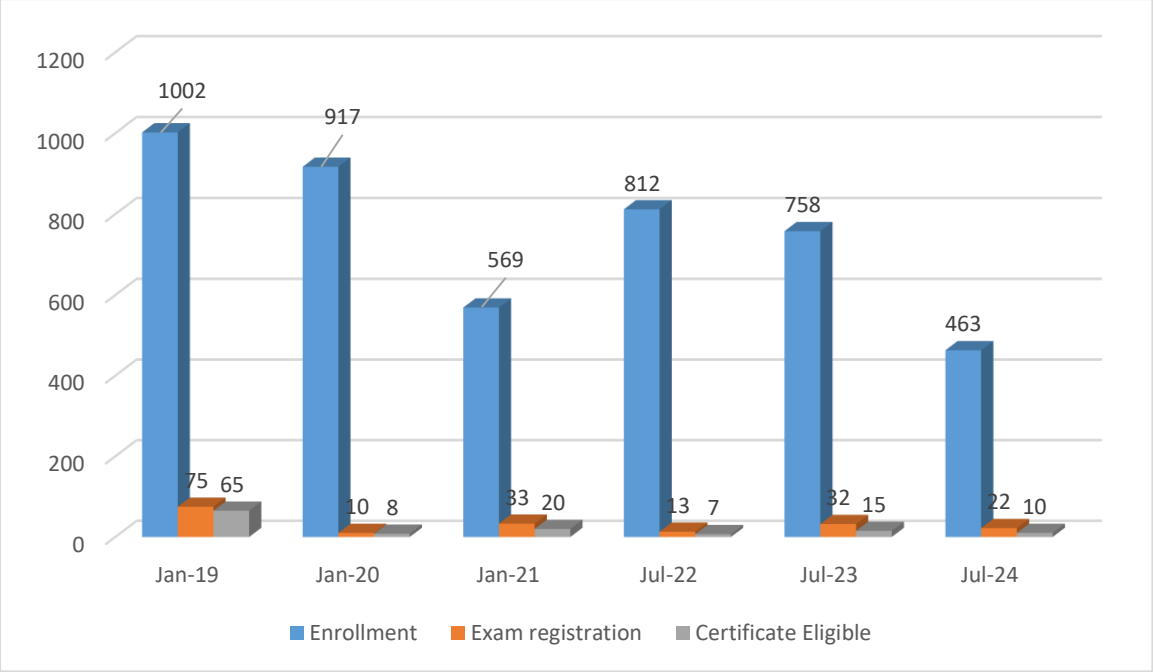
Prof. Bishnupada Mandal
Chemical Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

This course will provide an overview of mass transfer operation at basic to an intermediate level. Coverage will be relatively broad. This course applies the concepts of di-usion and interphase mass transfer to the analysis of di-erend mass transfer operations such as absorption and distillation. The goal is to provide students with the theoretical/analytical background to understand mass transfer operations as well as application and to tackle the sort of complex problems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	1002	75	65
Jan-Apr 2020	Rerun	917	10	8
Jan-Apr 2021	Rerun	569	33	20
Jul-Dec 2022	Rerun	812	13	7
Jul-Oct 2023	Rerun	758	32	15
Jul-Oct 2024	Repeat	463	22	10



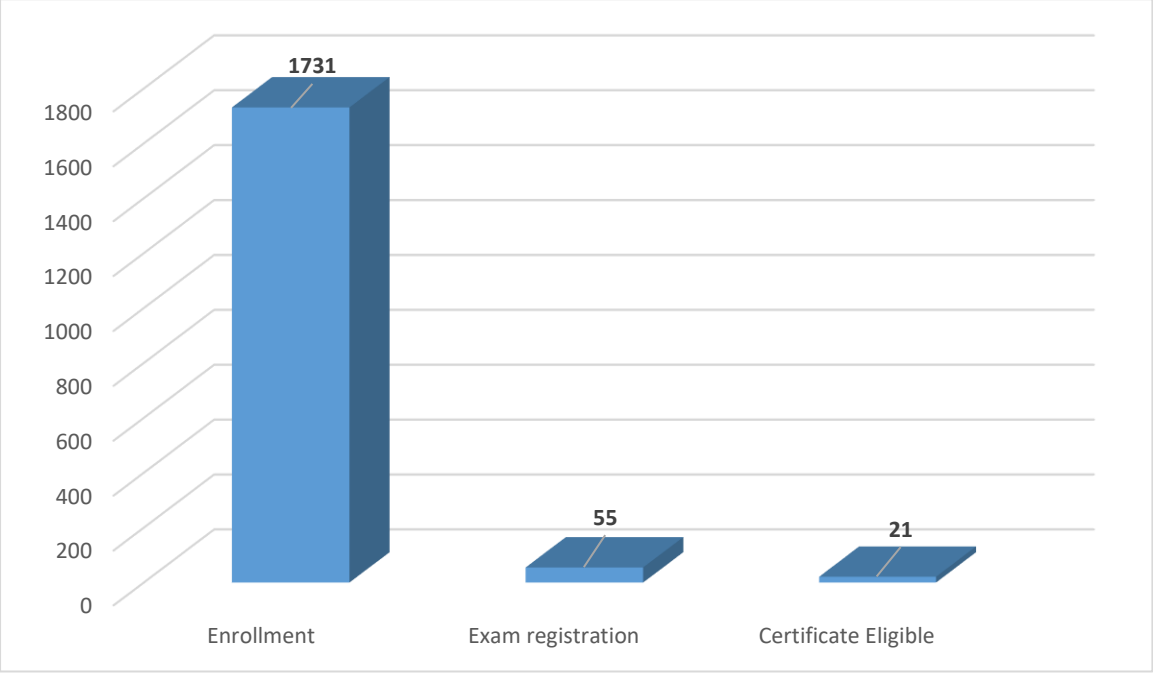
Prof. Sajith Gopalan
Computer Science and Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

A conventional algorithm uses a single processing element. A parallel algorithm assumes that there are multiple processors. These processors may communicate with each other using a shared memory or an interconnection network. An algorithm designed for a large number (for example, a polynomial in the problem size) of processors can be simulated on a machine with a small number of processors for a trade o- on time, and therefore is of practical value, while at the same time allowing us to test the limits of parallelism. Many algorithmic design techniques in the parallel setting will be explored. Parallel complexity theory will also be briefly studied.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	1737	55	21



Polymer Assisted Abrasive Finishing Processes

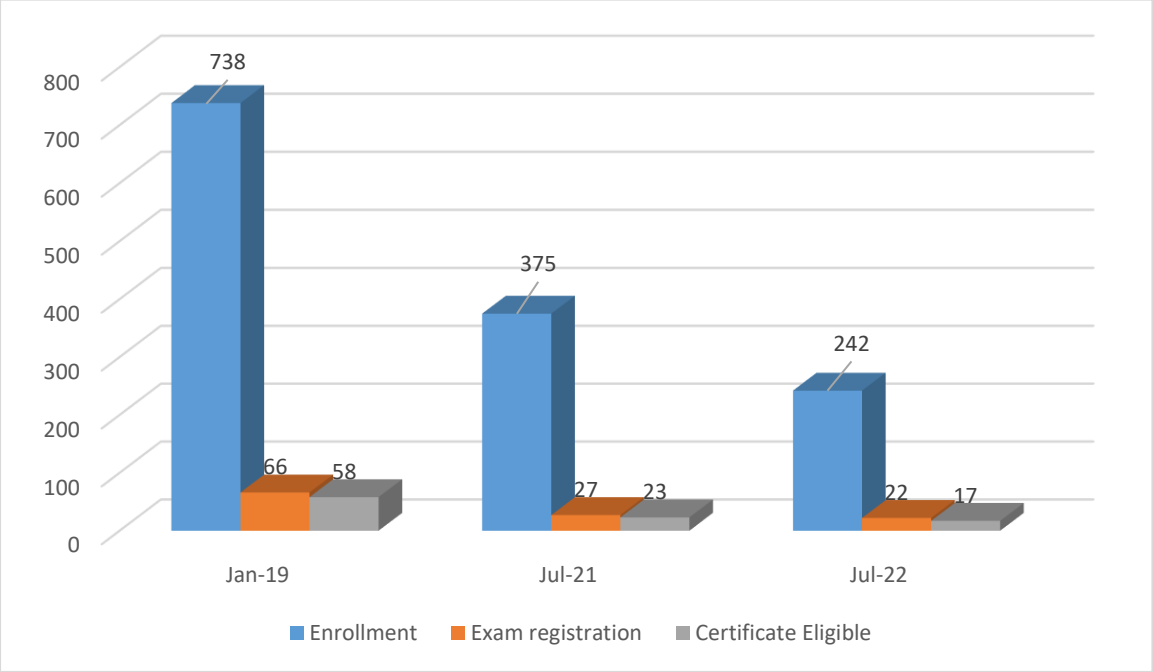
Prof. Mamilla Ravi Sankar
Mechanical Engineering

Type of the course: New, Jan 2019 run Duration: 4 weeks

Course Outline:

Micro and Nano finishing is one of the basic courses for the mechanical undergraduate students. This process comes under the subtractive manufacturing processes where in material is removed in micro to nano range. This course gives the basic understanding of the various polymer assisted abrasive micro to nano finishing processes and its physics. The mentioned syllabus is systematic order to understand gradually, what is the importance of surface finish, how the polymers supports the abrasive particles to finish the workpiece surface to nano level. This course mostly deals with abrasive flow finishing process where polymer rheological abrasive medium/fluids are used achieve nano surface roughness. This course also gives emphasis on polymer rheology and its effect on nano finishing.

Timeline	Type	Enrolled	Registered	Certified
Jan-Feb 2019	New	738	66	58
Jul-Aug 2021	Rerun	375	27	23
Jul-Dec 2022	Rerun	242	22	17



Prof. Dipankar N Basu
Mechanical Engineering

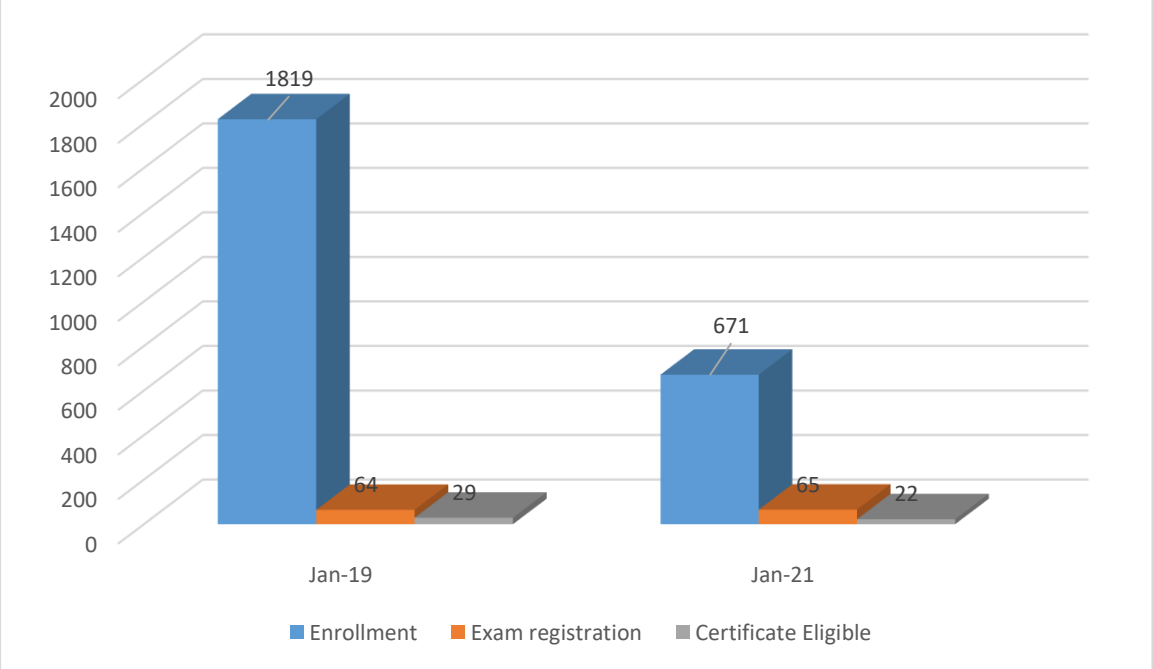
Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

Measurement is always of fundamental significance to the practicing engineers. For the development of any mechanical design procedure, experiments are of paramount interest.

Accordingly, measurement and correct interpretation of the concerned observation are necessary part of any standard engineering task and also R&D. present course will introduce the student to the fundamentals of measurement, discussing about various relevant concepts &terminologies. The mathematical background requirement, categorize& analyze various measurement devices will be prepared and a very pertinent discussion on digitalization will be presenters of scientific interest, such as displacement, motion, stress, force, flow, pressure, temperature etc., will be discussed in detail.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	1819	64	29
Jan-Apr 2021	Rerun	671	65	22



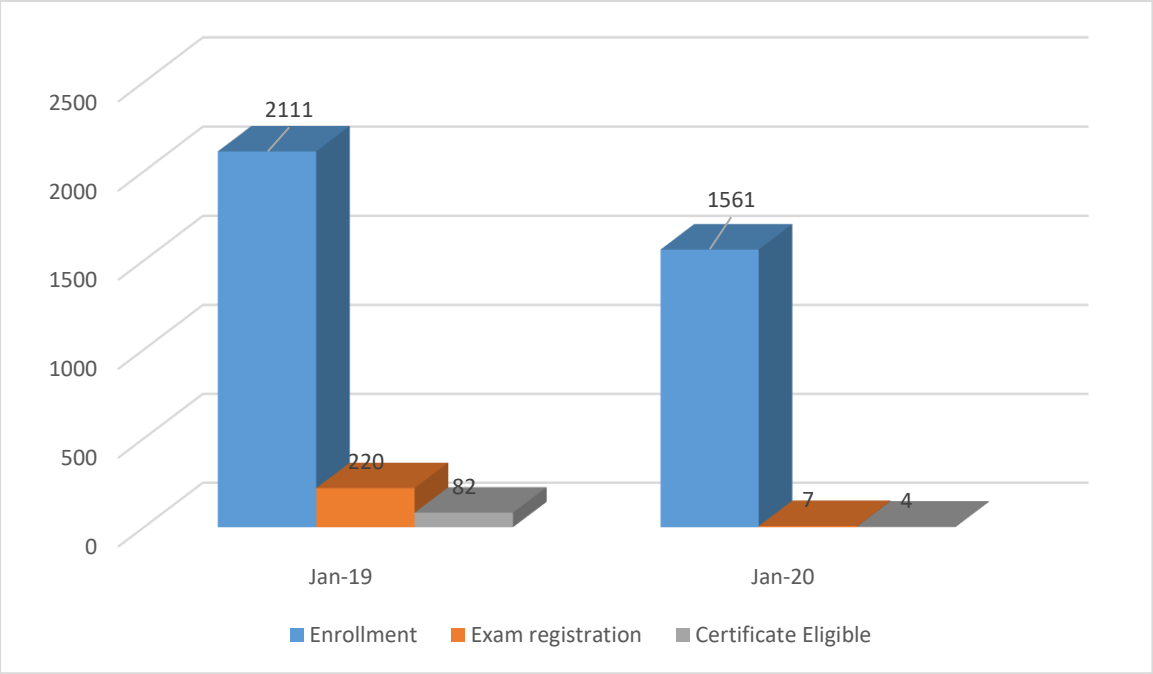
Prof. Benny George K
Computer Science and Engineering

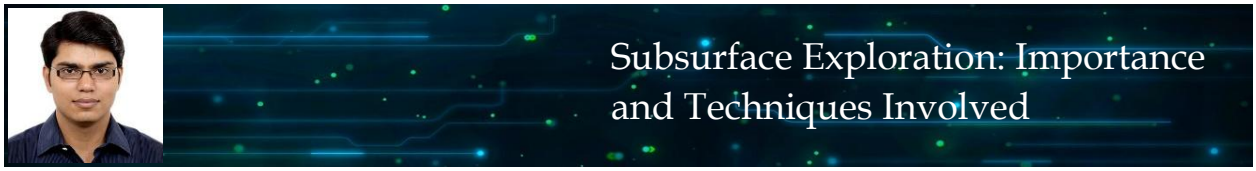
Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

Algorithms are required to be "correct" and "fast". In a wide variety of applications, these twin objectives are in conflict with each other. Fortunately, neither of these ideals are sacrosanct. Therefore, we can often try to optimize one of these goals by incurring a small penalty on the other. This takes us to the field of Randomized Algorithms. Often, the randomized variants, in addition to being faster than their deterministic counterpart, are simpler to understand and implement. In this course, we will study this tradeoff- between correctness and speed. We will be learning a number of methods to design and analyze randomized algorithms.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	2111	220	82
Jan-Apr 2020	Rerun	1561	7	4





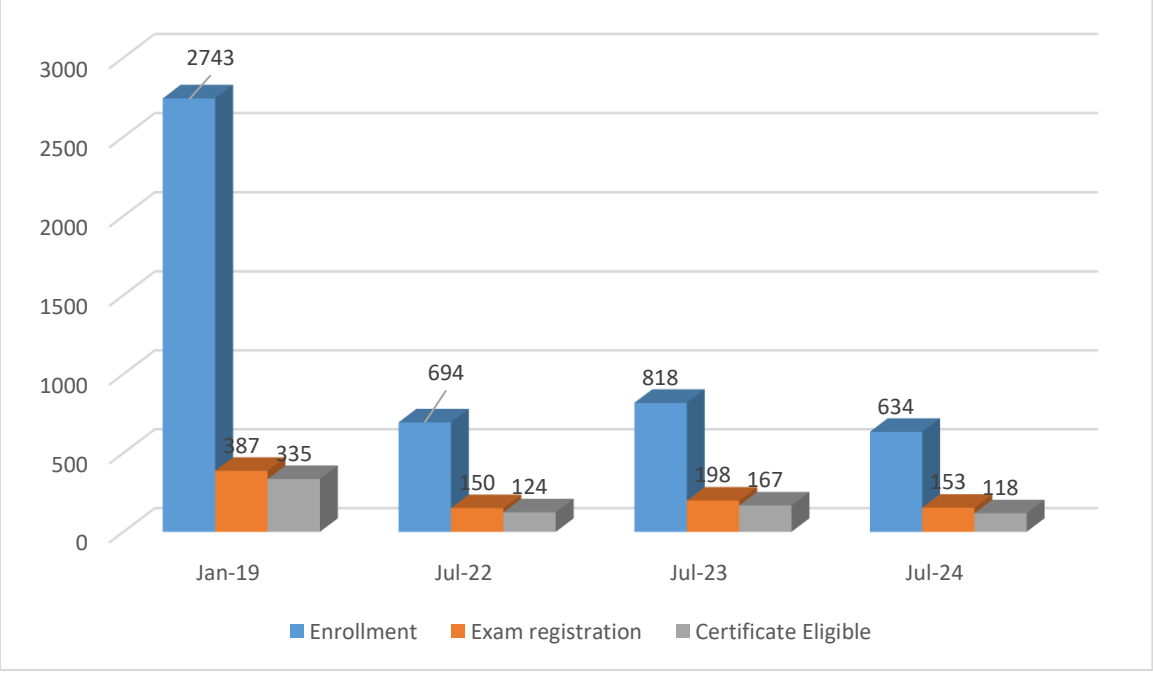
Prof. Abhishek Kumar
Civil Engineering

Type of the course: New, Jan 2019 run Duration: 8 weeks

Course Outline:

This course covers the requirement of thorough subsurface investigation, its importance in planning and execution of the project, classification of investigation to be adopted and challenges faced during many of the most complex civil engineering projects across the globe. Detailed discussion on methodologies starting with borehole drilling, rock drilling to advanced methods such as electrical resistivity, geophysical tests, sounding, magnetic anomaly, dilatometer test, pressure meter tests, ground penetrating radar will be covered along with numerical problems at various stages. In addition, testing on piles which is a very hot topic these days, will be covered in the course

Timeline	Type	Enrolled	Registered	Certified
Feb-Apr 2019	New	2743	387	335
Jul-Dec 2022	Rerun	694	150	124
Jul-Sep 2023	Rerun	818	198	167
Jul-Sep 2024	Rerun	634	153	118



Transport Phenomena of Non-Newtonian Fluids

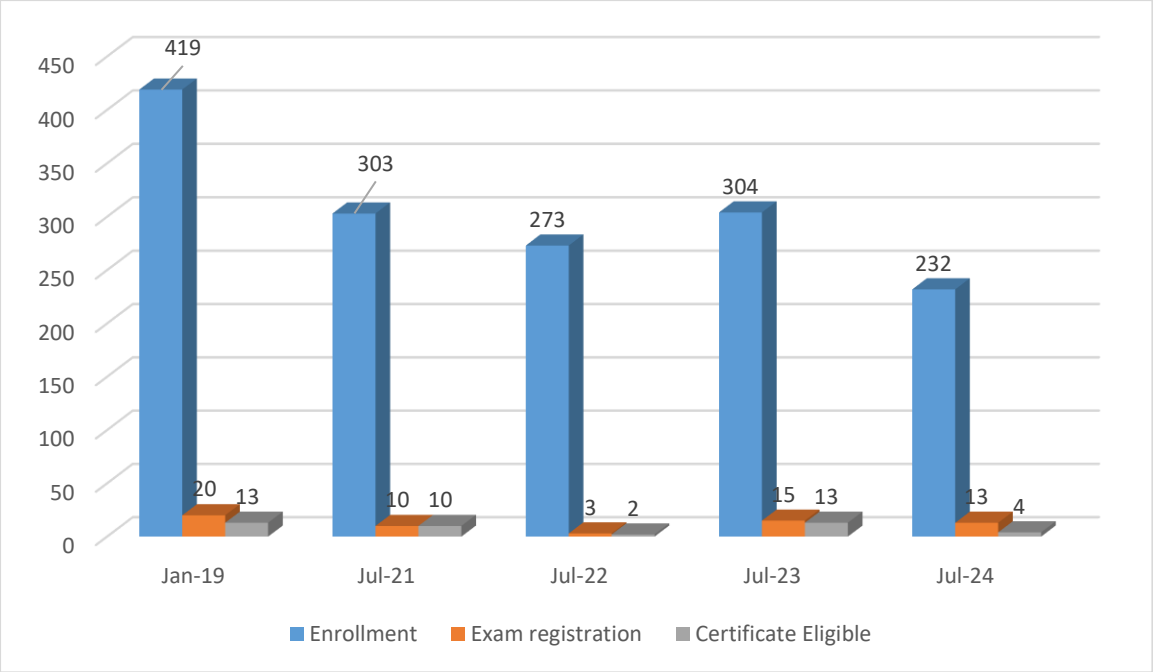
Prof. Nanda Kishore
Chemical Engineering

Type of the course: New, Jan 2019 run Duration: 12 weeks

Course Outline:

Non-Newtonian fluids are often encountered in our daily life as well as in many industries. Some of the daily-life applications include personal care products such as cosmetics, gels, pastes; food stuffs such as sandwich spreads, ketchup, chocolate, soups, etc. Some of the industrial applications include processing of many polymers, paints and detergents, degassing of polymeric melts and glasses, use of non-Newtonian polymers in enhanced oil recovery, non-Newtonian fluidized beds, wastewater treatment, production of polymeric alloys and ceramics via liquid routes, pharmaceutical products wherein the polymer thickening agents are used to enhance their stability for extended shelf-life, pulp and paper industries, etc. Because of aforementioned overwhelming applications, it is required for both undergraduate and postgraduate students to acquire enough academic experience related to the momentum, heat and mass transfer phenomena associated with non-Newtonian fluids. Thus, in this course, details of types and mathematical models of non-Newtonian fluids, and their momentum, heat and mass transport phenomena are discussed along with the corresponding boundary layer flows. Problems would be discussed on the cases of engineering applications where combined momentum and heat transfer, combined momentum and mass transfer, combined mass and heat transfer, combined heat and mass transport along with homogenous and/or heterogeneous reactions are involved simultaneously.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2019	New	419	20	13
Jul-Oct 2021	Rerun	303	10	10
Jul-Dec 2022	Rerun	273	3	2
Jul-Oct 2023	Rerun	304	15	13
Jul-Oct 2024	Repeat	232	13	4



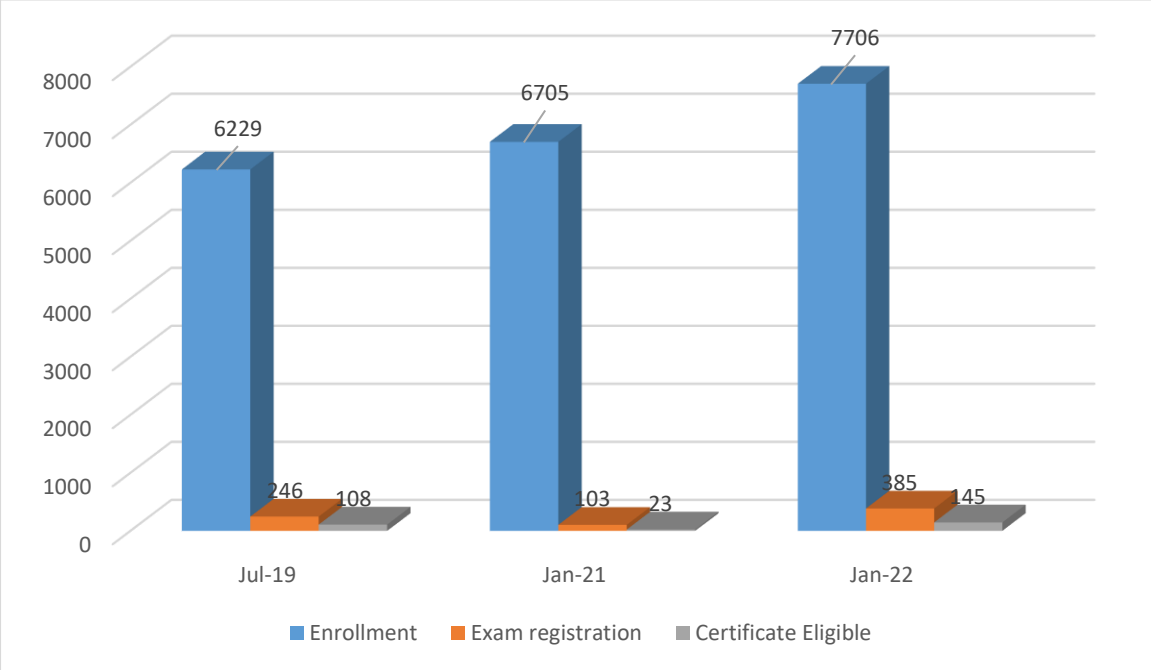
Prof. John Jose
Computer Science and Engineering

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

Applications and handheld devices play a major role in ensuring comfort in our day- today life. These applications run on handheld electronic gadgets with high-end microprocessor support. Modern CPU designers handle challenges imposed by these applications with cost effective architectural enhancements. This course provides a deeper insight into the design of high-end microprocessors that will support the future applications.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2019	New	6229	246	108
Feb-Apr 2021	Rerun	6705	103	23
Feb-Apr 2022	Rerun	7706	385	145



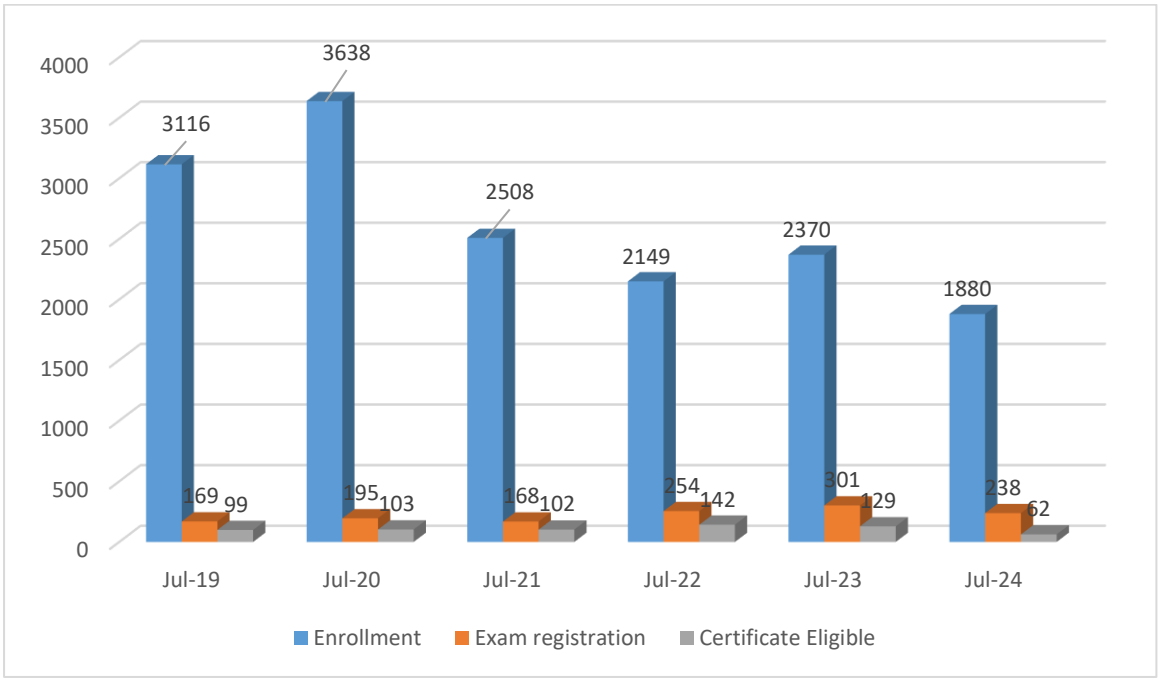
Prof. Vinayak N. Kulkarni
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course deals with the gas power cycles for aircraft propulsion. Therefore, different types of aircraft engines, their parts and their performance parameters are discussing. Then the cycle analysis and its different attachment for improvisation are also focused. Further, different parts of aircraft engines like compressor, turbines, combustor and nozzle are discussed in detail.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	3116	169	99
Sep-Dec 2020	Rerun	3638	195	103
Jul-Oct 2021	Rerun	2508	168	102
Jul-Dec 2022	Rerun	2149	254	142
Jul-Oct 2023	Rerun	2370	301	129
Jul-Oct 2024	Rerun	1880	238	62



Applied Thermodynamics for Engineers

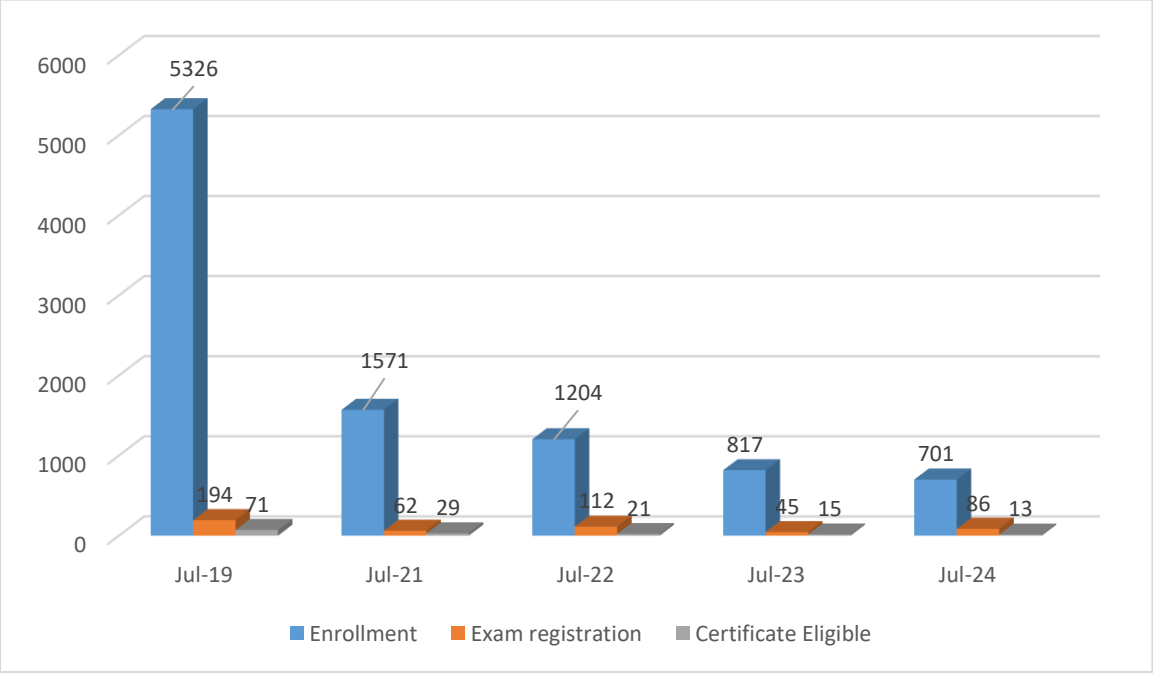
Prof. Dipankar N. Basu
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

Thermodynamics is a subject of fundamental interest to Mechanical engineers and therefore is always taught in the 2nd or 3rd semester. Present course can be viewed as the next step, where the thermodynamic principles will be employed to discuss about different power producing & absorbing cycles. Properties of pure substance will be discussed, along with the thermodynamic property relations, thereby enabling the participants to estimate all relevant thermodynamic properties at any particular state point. Subsequently the gas & vapor power cycles will be analyzed, followed by the principles of cogeneration & combined cycles. Then the refrigeration cycles will be introduced, followed by a discussion on the selection of refrigerants. Subsequently the properties of gas mixtures and gas-vapor mixtures will be discussed, leading to psychometric & psychometric processes. The course will be completed with a brief introduction to the chemical equilibrium.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	5326	194	71
Jul-Oct 2021	Rerun	1571	62	29
Jul-Dec 2022	Rerun	1204	112	21
Jul-Oct 2023	Rerun	817	45	15
Jul-Oct 2024	Rerun	701	86	13



Chemical Process Intensification

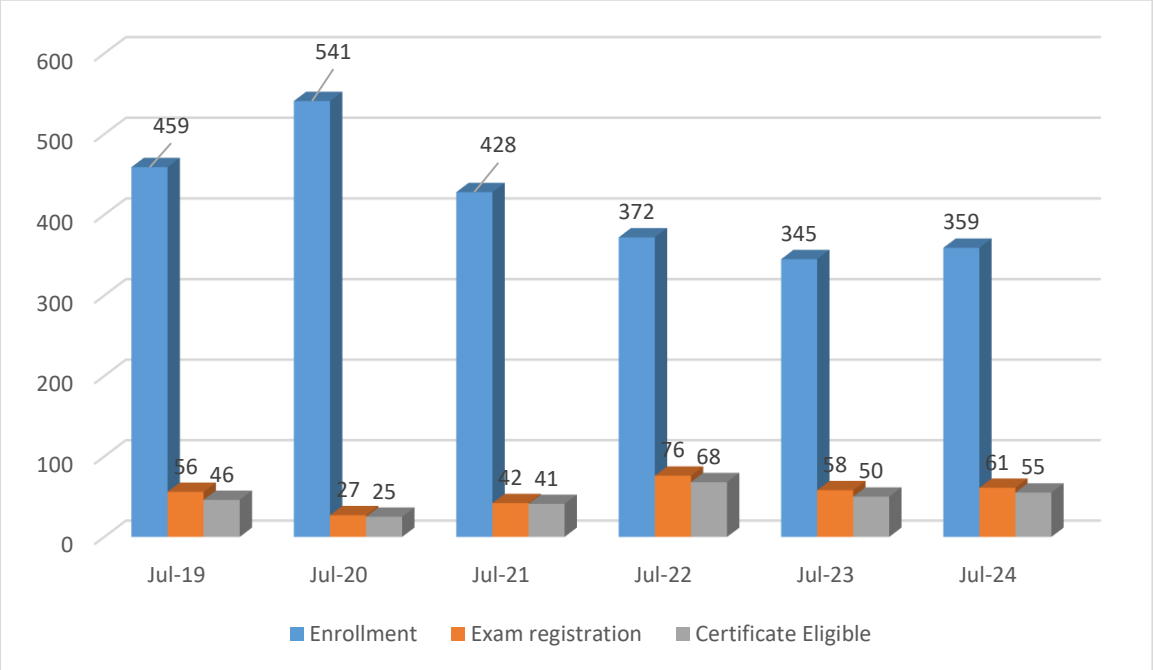
Prof. S. K. Majumder
Chemical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course covers the developments in a number of intensified technologies, with particular emphasis on their application in chemical processes. The course is intended to be a useful resource for practicing engineers and chemists alike who are interested in applying intensified reactor and/or separator systems in chemical industries. It will provide a basic knowledge of chemical engineering principles and process intensification for chemists and engineers who may be unfamiliar with these concepts. It will be a valuable tool for chemical engineers who wish to fully apply their background in reaction and separation engineering to the design and implementation of green processing technologies based on process intensification principles. Students on undergraduate and postgraduate degree programmes which cover topics on advanced reactor designs, process intensification, will gain a better understanding of the practical applications in different areas.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	459	56	46
Sep-Dec 2020	Rerun	541	27	25
Jul-Oct 2021	Rerun	428	42	41
Jul-Dec 2022	Rerun	372	76	68
Jul-Oct 2023	Repeat	345	58	50
Jul-Oct 2024	Repeat	359	61	55



Chemical Reaction Engineering-I

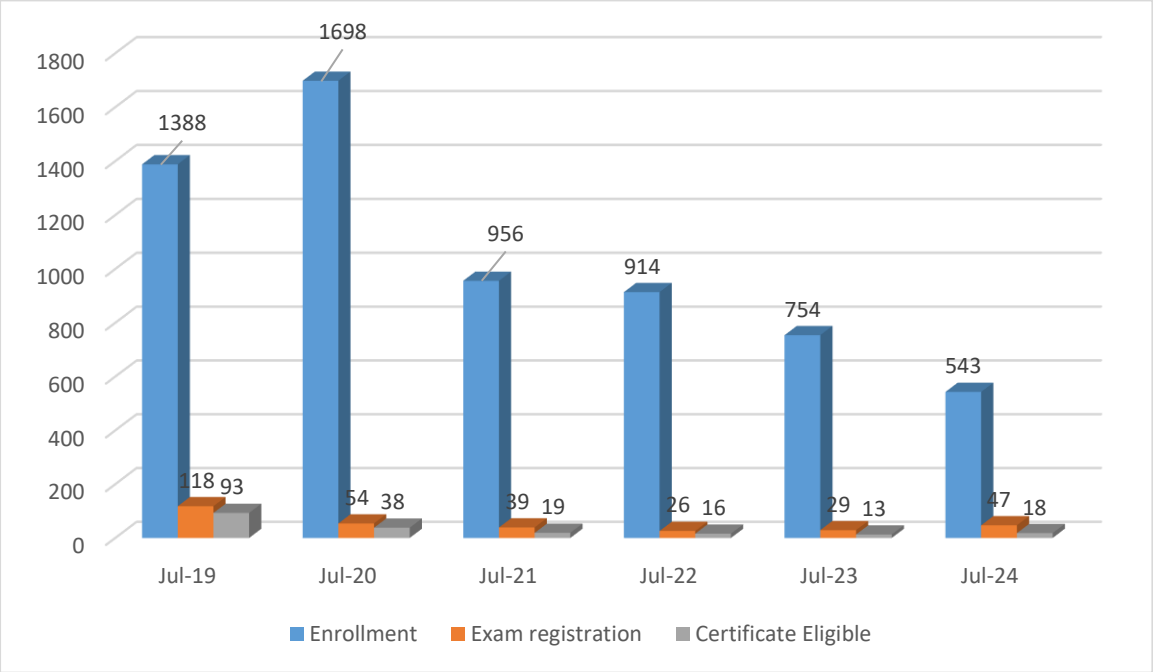
Prof. Bishnupada Mandal
Chemical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course will provide an overview of chemical kinetics and reactor design at basic to an intermediate level. Coverage will be relatively broad. This course applies the concepts of reaction rate, stoichiometry and equilibrium to the analysis of chemical and biological reacting systems such as derivation of rate expressions from reaction mechanisms and equilibrium or steady state assumptions and design of chemical and biochemical reactors via synthesis of chemical kinetics, and mass and energy balances. The goal is to provide students with the theoretical/analytical background to understand chemical kinetics and reactor design and to tackle the short of complex problems.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	1388	118	93
Sep-Dec 2020	Rerun	1698	54	38
Jul-Oct 2021	Rerun	956	39	19
Jul-Dec 2022	Rerun	914	26	16
Jul-Oct 2023	Rerun	754	29	13
Jul-Oct 2024	Repeat	543	47	18



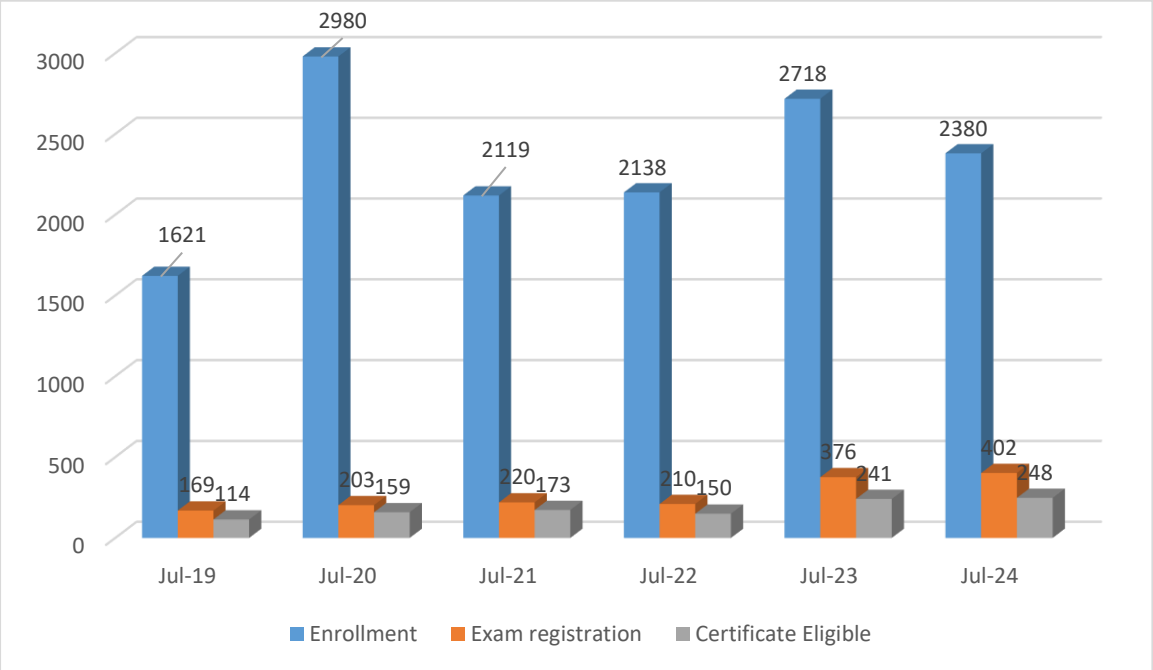
Prof. Rajshree Bedamatta
Humanities and Social Sciences

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

This course will provide training in some methodological approaches in Development studies and Development research that will equip the students into applying them in their dissertations or project evaluations. Applied and practice-oriented issues in development research methods will be taken up by focusing on the differences in qualitative, quantitative and mixed-methods research. Anyone who is interested in development issues and undertaking development research is encouraged to enroll.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2019	New	1621	169	114
Sep-Nov 2020	Rerun	2980	203	159
Aug-Oct 2021	Rerun	2119	220	173
Jul-Dec 2022	Rerun	2138	210	150
Jul-Oct 2023	Rerun	2718	376	241
Aug-Oct 2024	Rerun	2380	402	248



Prof. Benny George K
Computer Science and Engineering

Prof. Sajith Gopalan
Computer Science and Engineering

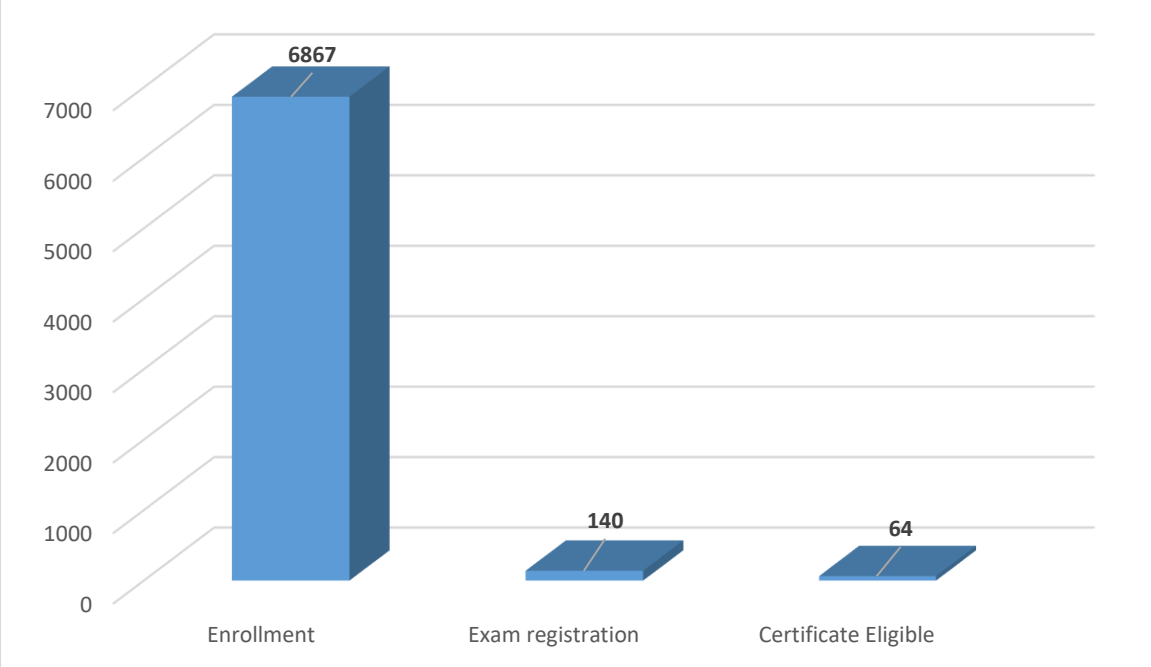
Type of the course: New, July 2019 run

Duration: 12 weeks

Course Outline:

Discrete Mathematics is the study of discrete objects as opposed to continuous objected like real numbers. The discrete objects like proofs, sets, graphs, colorings, algebraic structures, algorithms etc. These objects arise naturally and frequently in many areas of mathematics and computer science and are fundamental in an undergraduate curriculum of computer science and mathematics. In this course, we will focus on Logic, Set Theory, Number Theory, Algebraic Structures, Combinatorics and Graph Theory.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	6867	140	64



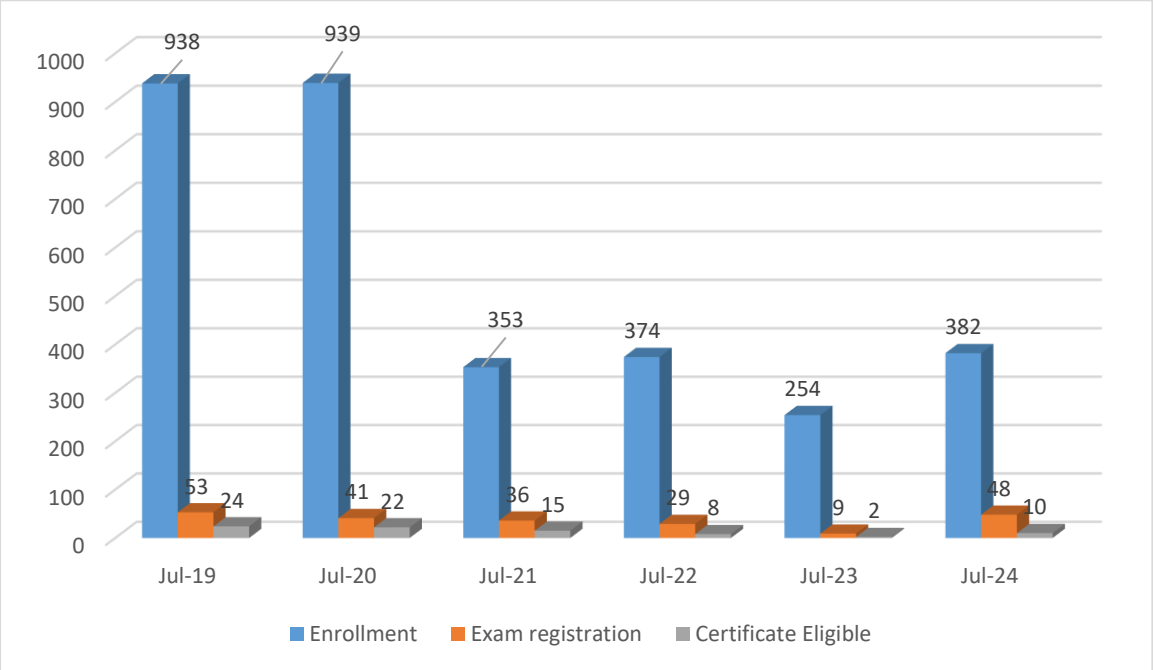
Prof. Prasenjit Khanikar
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

Study of materials behavior in extreme environments and development of new materials for such environments has become a vital research area for materials scientists and engineers in the 21 st century. Mechanical properties of materials under dynamic loading are considered as an important area of research and development in defense, automotive and aerospace industries. Under dynamic loading conditions, the inertial effects come to play an important role in the deformation behavior of the material. Many materials exhibit strain rate sensitivity at higher strain rates, i.e., flow stress dependence on strain rates. In addition, the failure mechanisms under high strain rate loading conditions are generally different than those occur in low strain rate. Furthermore, the deformation and failure mechanisms are controlled by the microstructure of the materials. This course will be important to mechanical, materials and civil engineers to understand materials behavior for ballistic applications, explosive forming or welding applications, automotive and aerospace applications.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	938	53	24
Sep-Dec 2020	Rerun	939	41	22
Jul-Oct 2021	Rerun	353	36	15
Jul-Dec 2022	Rerun	374	29	8
Jul-Oct 2023	Rerun	254	9	2
Jul-Oct 2024	Repeat	382	48	10



Ergonomics in Automotive Design

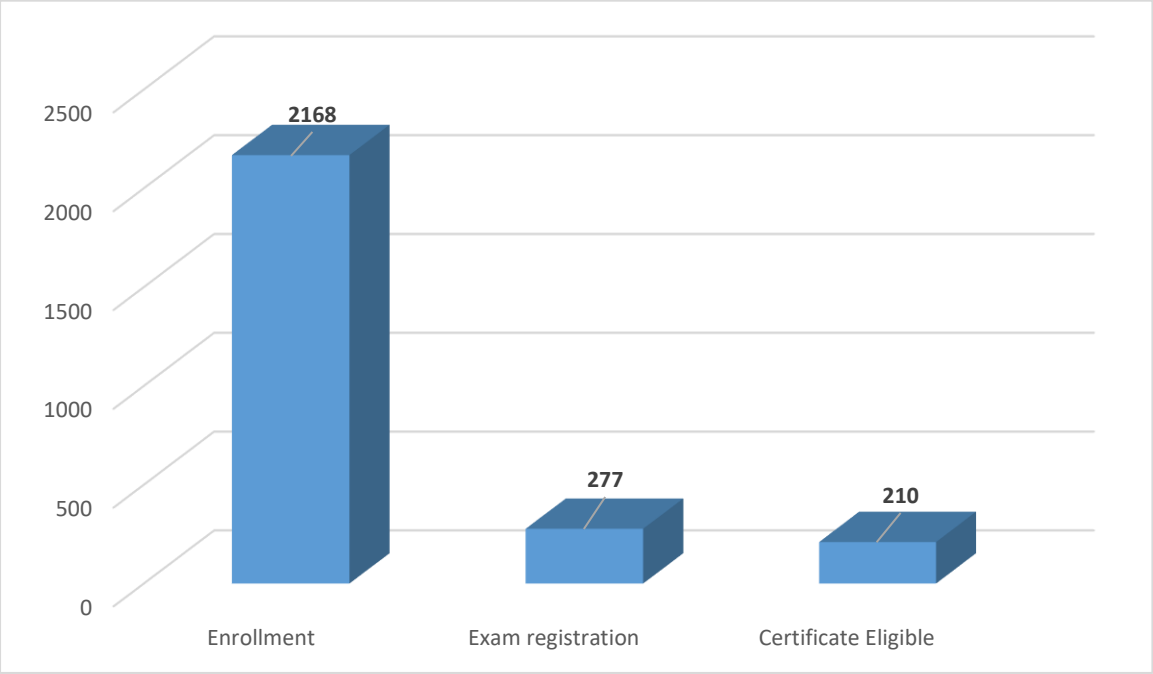
Prof. Sougata Karmakar
Design

Type of the course: New, July 2019 run Duration: 4 weeks

Course Outline:

Knowledge of 'Ergonomics/ Human Factors Engineering' is of utmost necessity for automotive design and engineering to achieve optimal compatibility between occupants and vehicle components in terms of physical, cognitive and environmental aspects. Although good number of Design and Engineering Schools in India are offering courses on Automobile Design, Transportation Design and Automobile Engineering but there is less focus on Automotive Ergonomics due to lack of resources and trained faculty members. The current elective would not only help the students and teachers involved in Automobile Design and Engineering to overcome the aforesaid limitations but also would be beneficial for the engineers and designers engaged in automotive sectors.

Timeline	Type	Enrolled	Registered	Certified
Jul-Aug 2019	New	2168	277	210



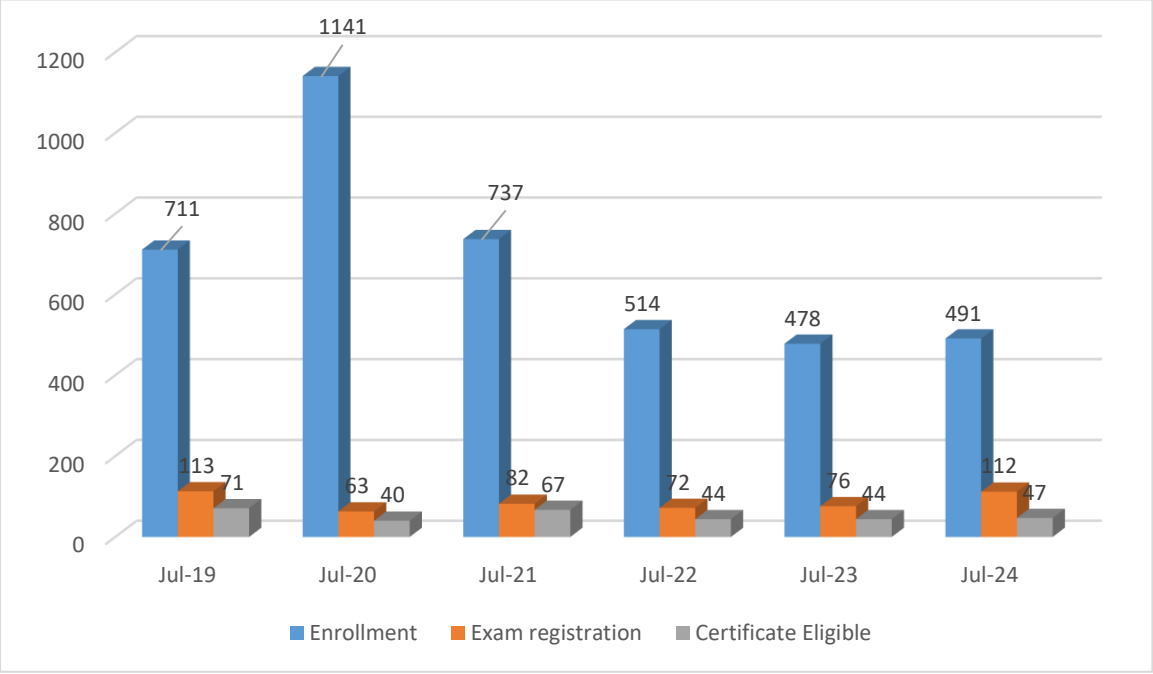
Prof. Urmi R Salve
Design

Type of the course: New, July 2019 run Duration: 4 weeks

Course Outline:

Ergonomic workplace analysis is a process where the ergonomic risk factors were evaluated using various validated tools and provide the probable recommendation to minimize the risk factors for development of work-related musculoskeletal disorders and improve the productive workday to reduce the cost for compensation, absenteeism and employee turnover. In the process of ergonomic workplace analysis, an ergonomist needs to evaluate the physical work environment, psychosocial risk factors as well as various generic risk factors which leads to the development of work-related musculoskeletal disorders. This course is based on the complete process evaluation of EWA.

Timeline	Type	Enrolled	Registered	Certified
Jul-Aug 2019	New	711	113	71
Sep-Oct 2020	Rerun	1141	63	40
Aug-Sep 2021	Rerun	737	82	67
Jul-Dec 2022	Rerun	514	72	44
Jul-Sep 2023	Rerun	478	76	44
Jul-Sep 2024	Repeat	491	112	47



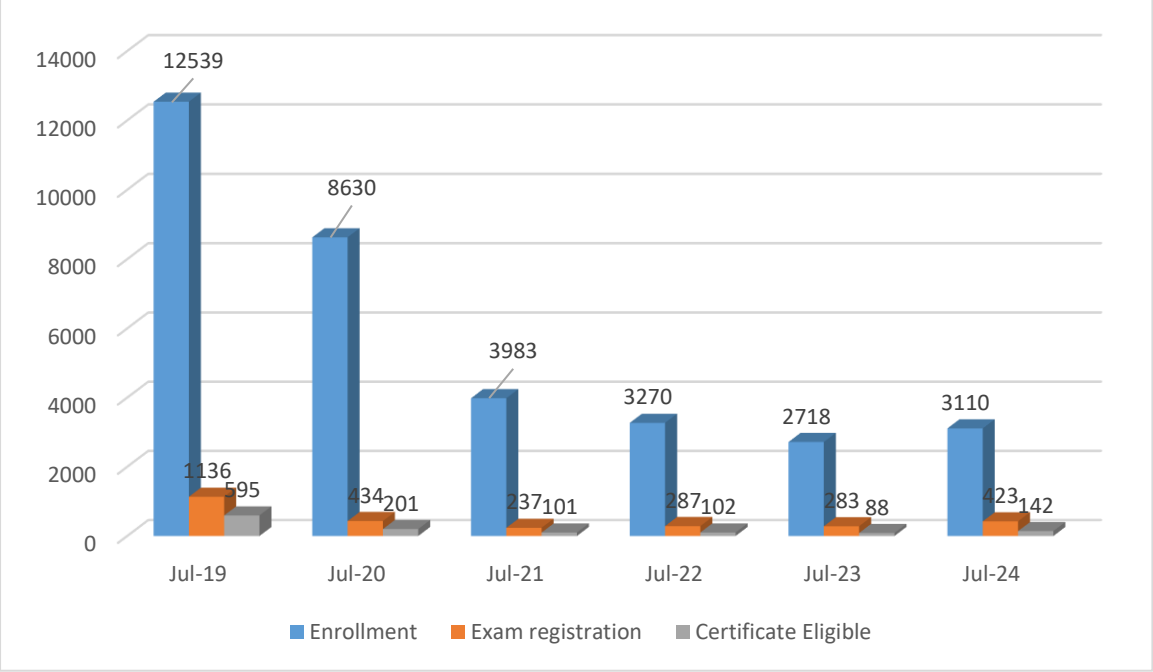
Prof. Subashisa Dutta
Civil Engineering

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

Fluid Mechanics is an inter-disciplinary course covering the basic principles and its applications in Civil Engineering, Mechanical Engineering and Chemical Engineering.The students will have new problem-solving approaches like control volume concept and streamline patterns which are now a days required to solve the real-life complex problems. The visualization of the fluid-flow problems will be demonstrated to enhance student's interest on the subject.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2019	New	12539	1136	595
Sep-Nov 2020	Rerun	8630	434	201
Jul-Oct 2021	Rerun	3983	237	101
Jul-Dec 2022	Rerun	3270	287	102
Jul-Oct 2023	Rerun	2718	283	88
Jul-Oct 2024	Rerun	3110	423	142



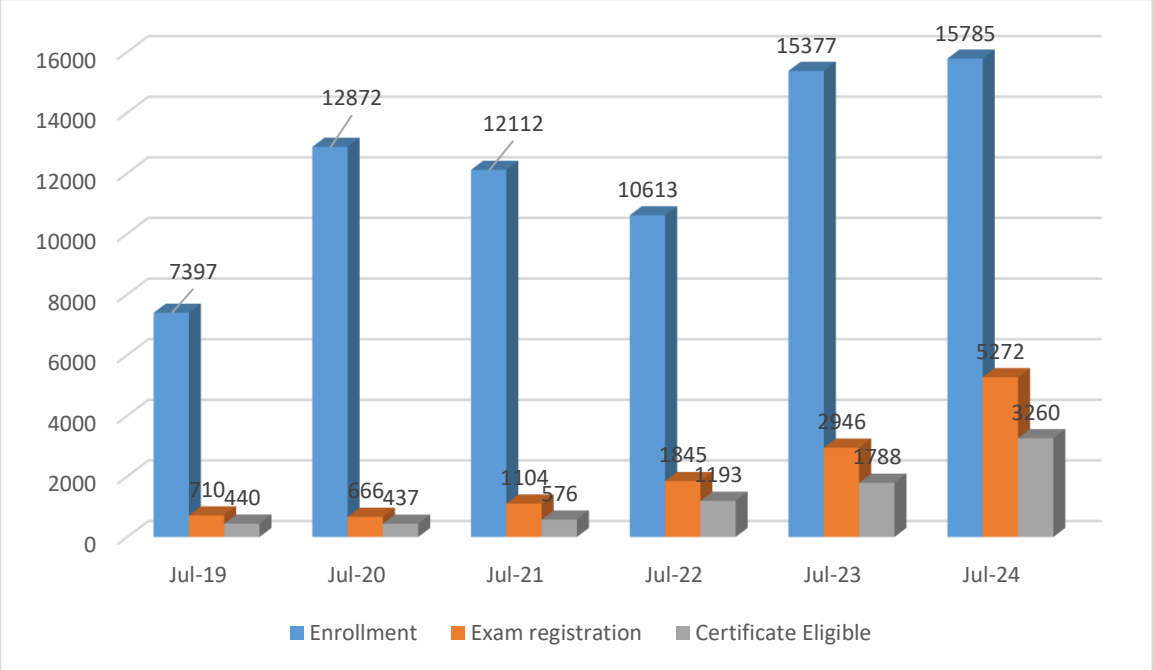
Prof. Shyamanta M. Hazarika
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

What does automatic scheduling or autonomous driving have in common with web search, speech recognition, and machine translation? These are complex real-world problems that span across various practices of engineering! Aim of artificial intelligence (AI) is to tackle these problems with rigorous mathematical tools. The objective of this course is to present an overview of the principles and practices of AI to address such complex real-world problems. The course is designed to develop a basic understanding of problem solving, knowledge representation, reasoning and learning methods of AI.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	7397	710	440
Sep-Dec 2020	Rerun	12872	666	437
Jul-Oct 2021	Rerun	12112	1104	576
Jul-Dec 2022	Rerun	10613	1845	1193
Jul-Oct 2023	Rerun	15377	2946	1788
Jul-Oct 2024	Rerun	15785	5272	3260



Prof. Amaresh Dalal
Mechanical Engineering

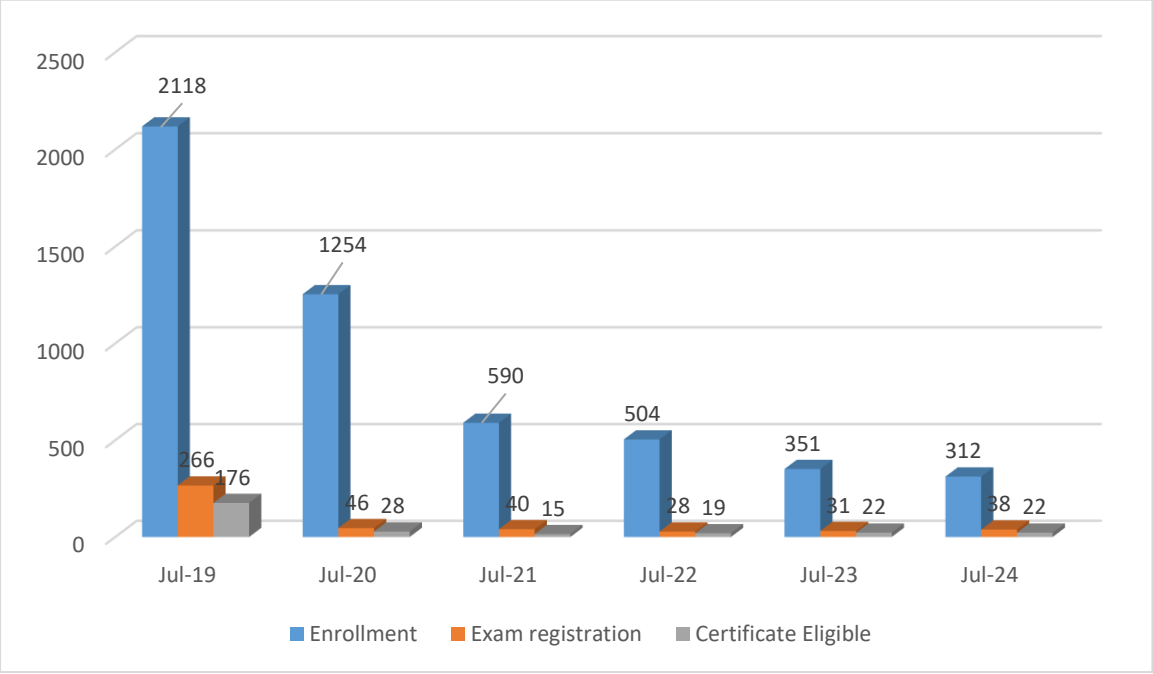
Prof. Dipankar N. Basu
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This is introductory course on conduction and radiation heat transfer. This course emphasizes the fundamental concepts and provides detailed solution methodology. This course will provide students with the tools to model, analyze and solve a wide range of engineering applications involving conduction and radiation heat transfer.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	2118	266	176
Sep-Dec 2020	Rerun	1254	46	28
Jul-Oct 2021	Rerun	590	40	15
Jul-Dec 2022	Rerun	504	28	19
Jul-Oct 2023	Rerun	351	31	22
Jul-Oct 2024	Repeat	312	38	22



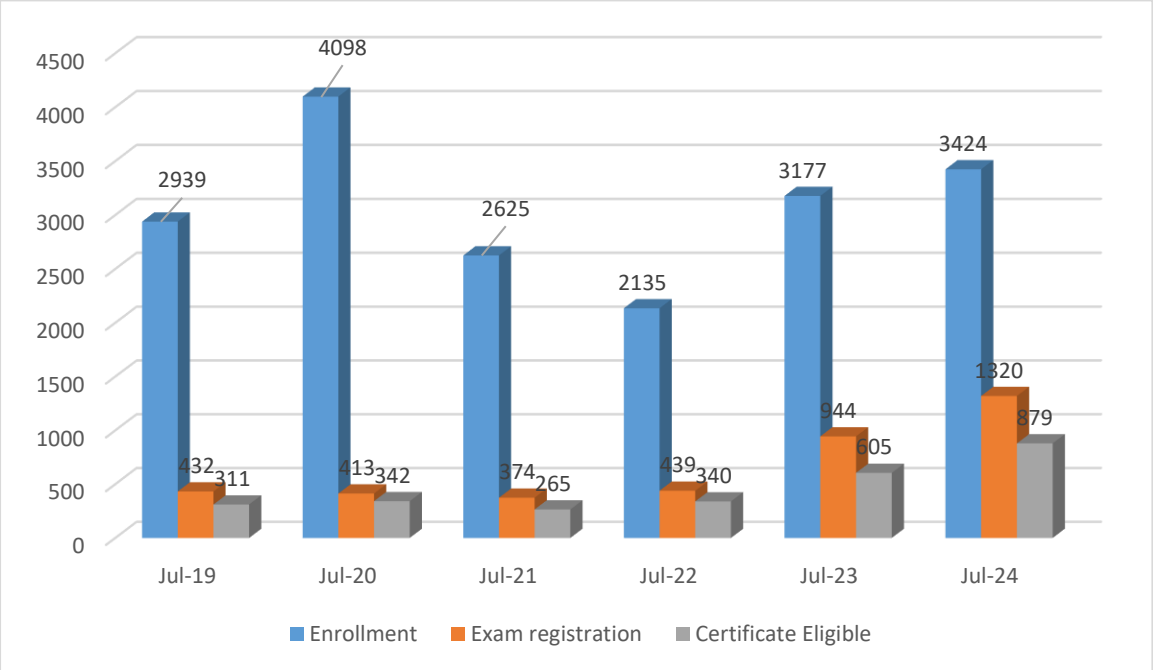
Prof. Vishal Trivedi
Biosciences and Bioengineering

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

In the current MOOCs course, I have put effort to briefly discuss about biotechnology, its scope and impact on human life with several customized products. The Development of technology and generation of product has multiple steps and understanding these steps are being covered in this course with a discussion of biotechnology application at the end. By the end of this course, student will be able to understand following aspects of biotechnology: 1. Basic metabolic pathways and their regulation. 2. Microbial growth kinetics with an emphasis on fermentation 3. Basic molecular biology tools used in biotechnology. 4. Basic methodology for product recovery and analysis.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	2939	432	311
Sep-Dec 2020	Rerun	4098	413	342
Jul-Oct 2021	Rerun	2625	374	265
Jul-Dec 2022	Rerun	2135	439	340
Jul-Oct 2023	Rerun	3177	944	605
Jul-Oct 2024	Rerun	3424	1320	879



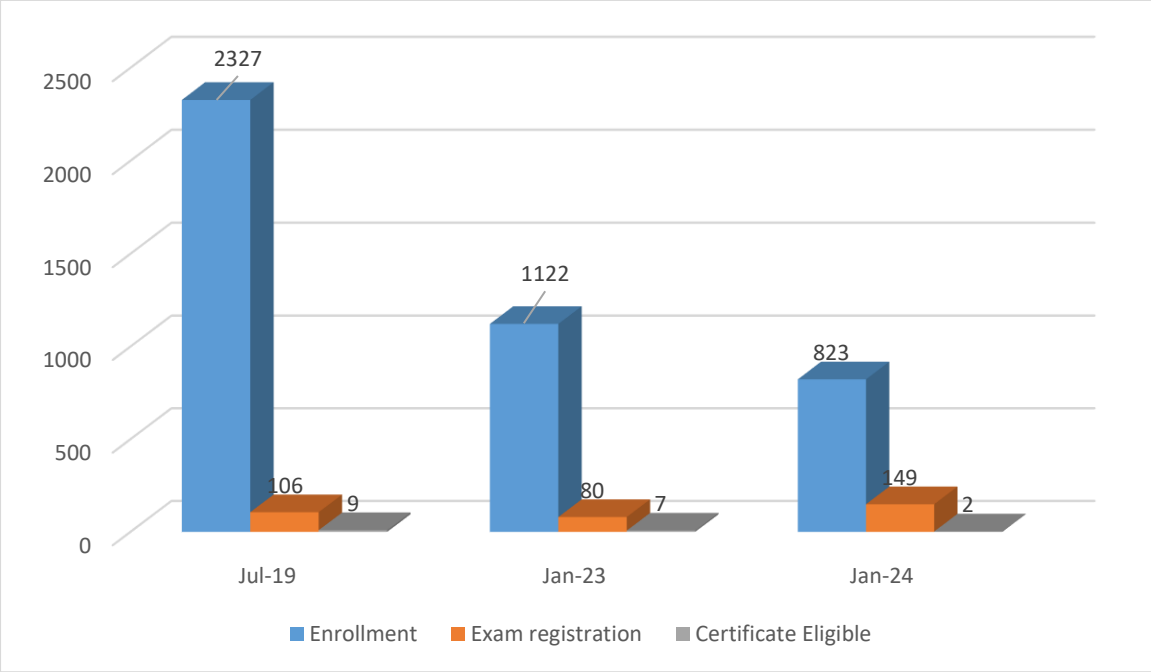
Prof. Girish S. Setlur
Physics

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

This is an introductory course in classical and quantum statistical mechanics which deals with the principle of ensembles, Classical, Fermi and Bose ideal gases, Pauli paramagnestim, Debye and Einstein's theory of specific heat and the 1D Ising model.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2019	New	2327	106	9
Jan-Apr 2023	Rerun	1122	80	7
Jan-Apr 2024	Repeat	823	149	2



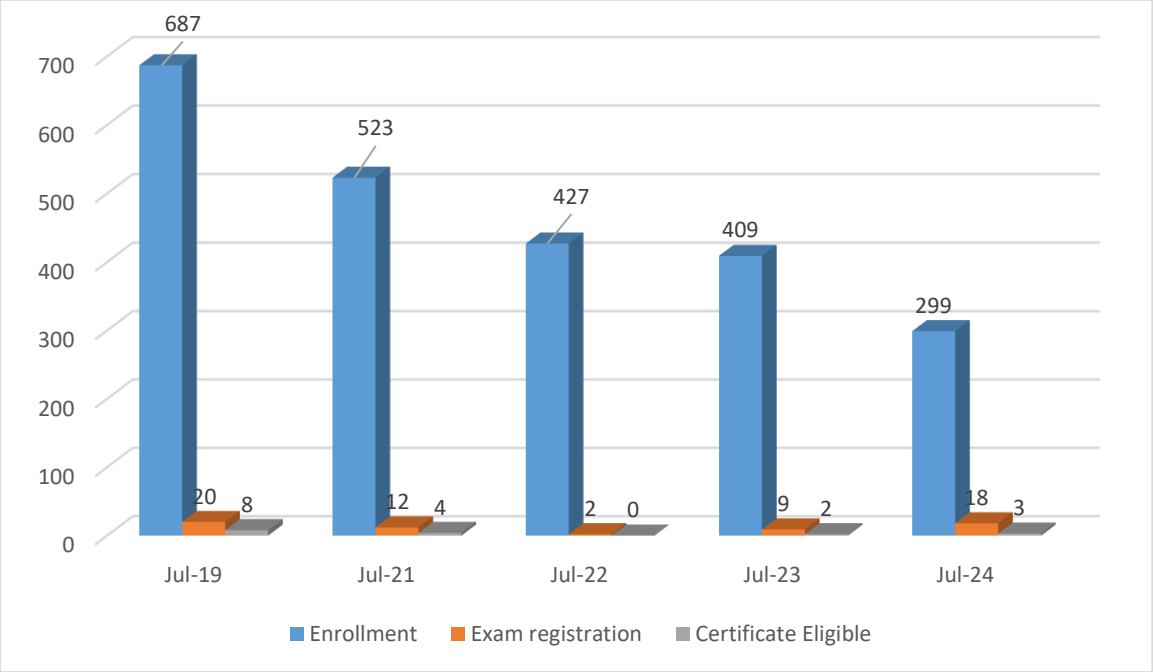
Prof. Chandan Das
Chemical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course will provide an overview on mass transfer at basic to an intermediate level. This course applies the concepts of diffusion and interphase mass transfer to the analysis of different unit operations such as humidification, drying, adsorption, extraction, leaching, crystallization and membrane processes. The course synthesizes fundamental concepts and analytical skills to understand mass transfer operations and to tackle the sort of complex problems. Information on key topics will be provided in the form of summary of lecture notes, problems and adequate references.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	687	20	8
Jul-Oct 2021	Rerun	523	12	4
Jul-Dec 2022	Rerun	427	2	0
Jul-Oct 2023	Rerun	409	9	2
Jul-Oct 2024	Repeat	299	18	3



Prof. N. Selvaraju
Mathematics

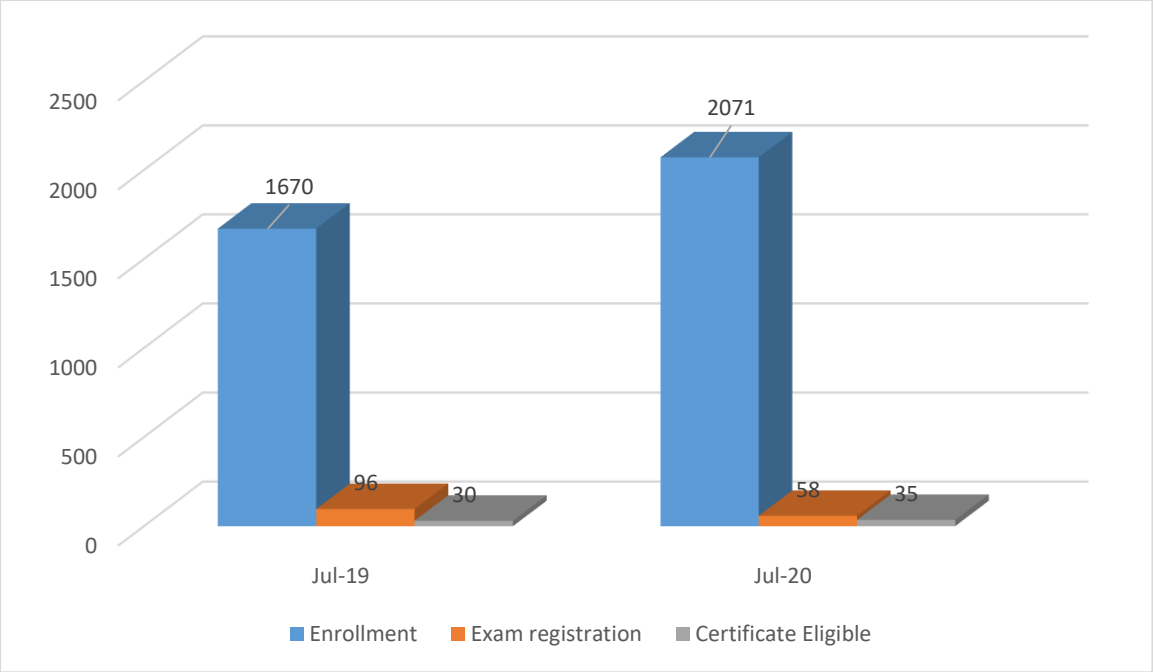
Prof. Siddhartha P. Chakrabarty
Mathematics

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

The course on 'Mathematical Finance' gives an introduction to this interesting and growing area. In particular, the course will cover two Nobel-prize winning frameworks, namely portfolio theory and the option pricing theory.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	1670	96	30
Sep-Dec 2020	Rerun	2071	58	35



Mathematical Modeling of Manufacturing Processes

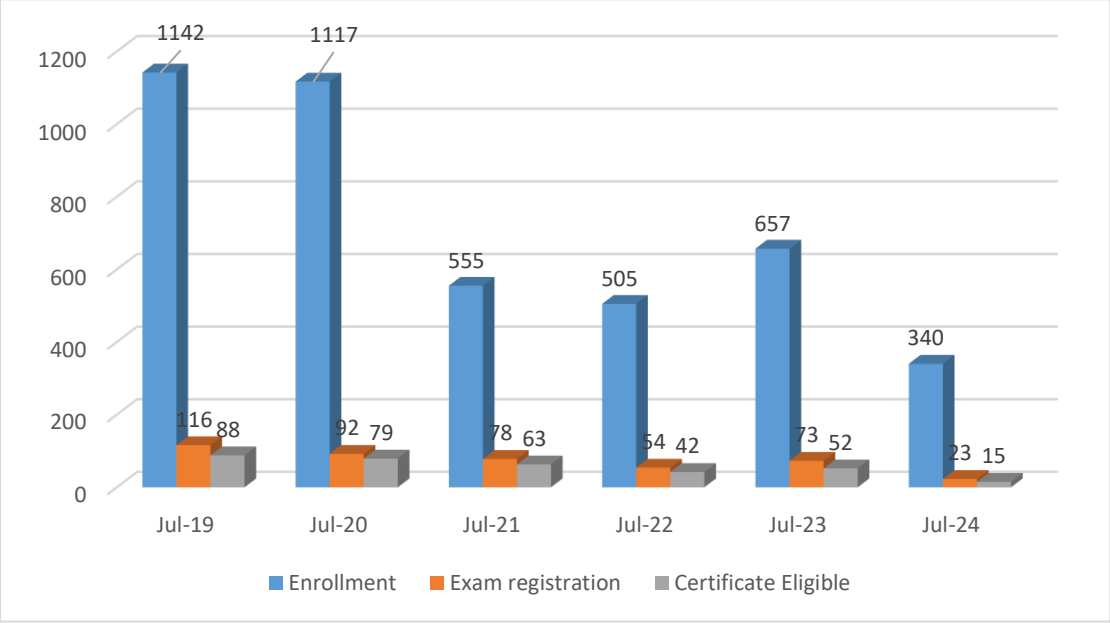
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

The understanding of the basic mechanism such as heat and mass transport with associated fluid flow including metallurgical transformation, distortion and residual stress generation in different manufacturing processes is the focus of this course. Understanding the complex interaction not only helps to develop mathematical model, it makes the foundation for analysis, numerical simulation at different scale and experimentation for different types of manufacturing processes. The development of computational models for a manufacturing process relies on mathematical expression of the governing mechanism. It helps to design relevant experiments and drives to find the data to be obtained. Mutual understanding between analytical/numerical and experimental results leads to better insight of the basic manufacturing processes that impact on the improvement of existing process and directs for the development of new process. However, this course is completely different from statistical or data driven modeling approach. This course emphasized on the understanding of the most general to advanced manufacturing processes based on scientific principle. The complex mechanism is presented in a simplified way to understand the subject at elementary level. The broad impact is that the students will be able to develop physics based computational model of manufacturing process using standard commercial package (However, this course does not intend to cover the learning of the commercial software).

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	1142	116	88
Sep-Dec 2020	Rerun	1117	92	79
Jul-Oct 2021	Rerun	555	78	63
Jul-Dec 2022	Rerun	505	54	42
Jul-Oct 2023	Rerun	657	73	52
Jul-Oct 2024	Repeat	340	23	15



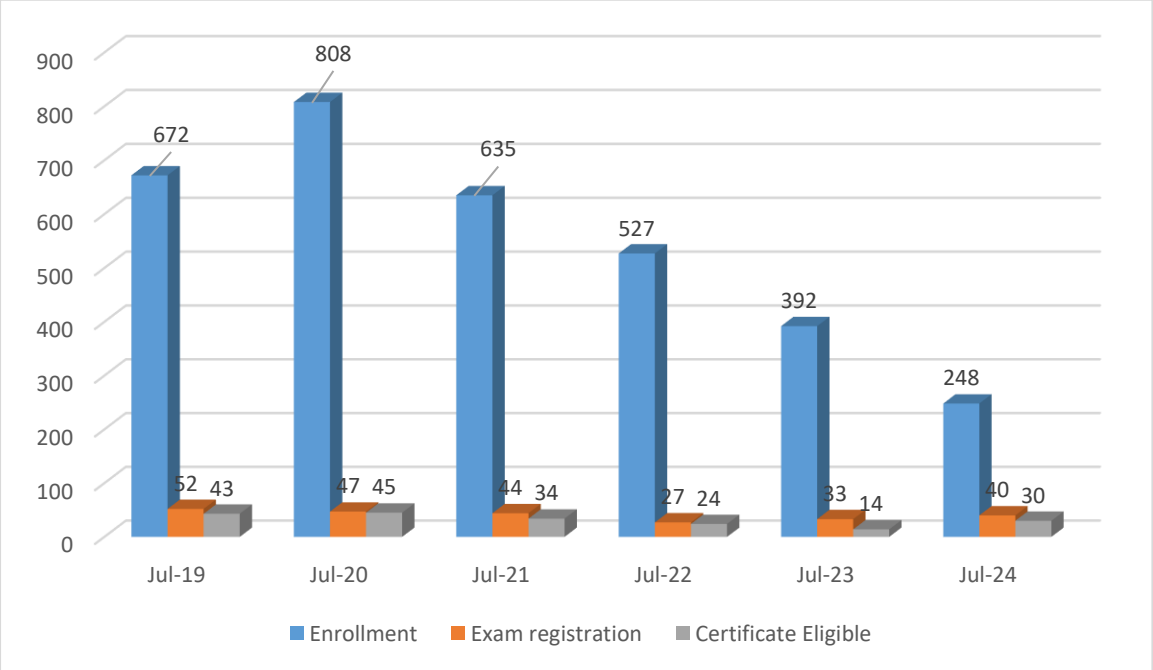
Prof. Nanda Kishore
Chemical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

Chemical engineering consists of several unit operations and unit processes. Before the reaction step, the raw materials should be processed through various unit operations and similarly after the reaction step as well the products are passed through various unit operations either for product separation or for purity. Thus, unit operations are very essentially part of the chemical engineering; and hence, basic knowledge about the principles and equipment of solid-solid unit operations and solid-liquid unit operations is mandatory for any professional chemical engineer.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	672	52	43
Sep-Dec 2020	Rerun	808	47	45
Jul-Oct 2021	Rerun	635	44	34
Jul-Dec 2022	Rerun	527	27	24
Jul-Oct 2023	Rerun	392	33	14
Jul-Oct 2024	Repeat	248	40	30



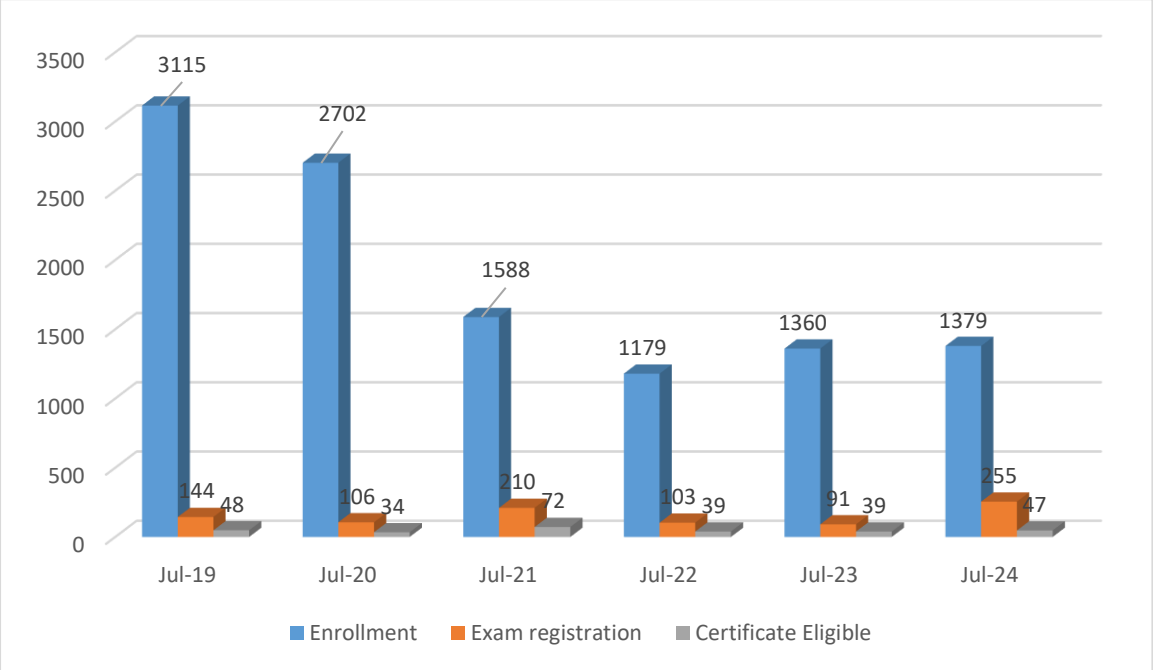
Prof. Ratnajit Bhattacharjee
Electronics and Electrical Engineering

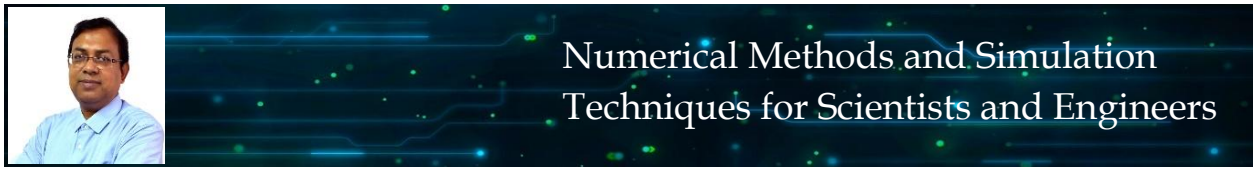
Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course is indented to provide a foundation for microwave engineering to the undergraduate students. Rigorous treatment of the fundamentals of microwave engineering will be provided. Design of different passive and some active microwave circuits/subsystems will be covered in detail. This course will also provide an overview of application of microwave in communication and other areas.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	3115	144	48
Sep-Dec 2020	Rerun	2702	106	34
Jul-Oct 2021	Rerun	1588	210	72
Jul-Dec 2022	Rerun	1179	103	39
Jul-Oct 2023	Rerun	1360	91	39
Jul-Oct 2024	Rerun	1379	255	47





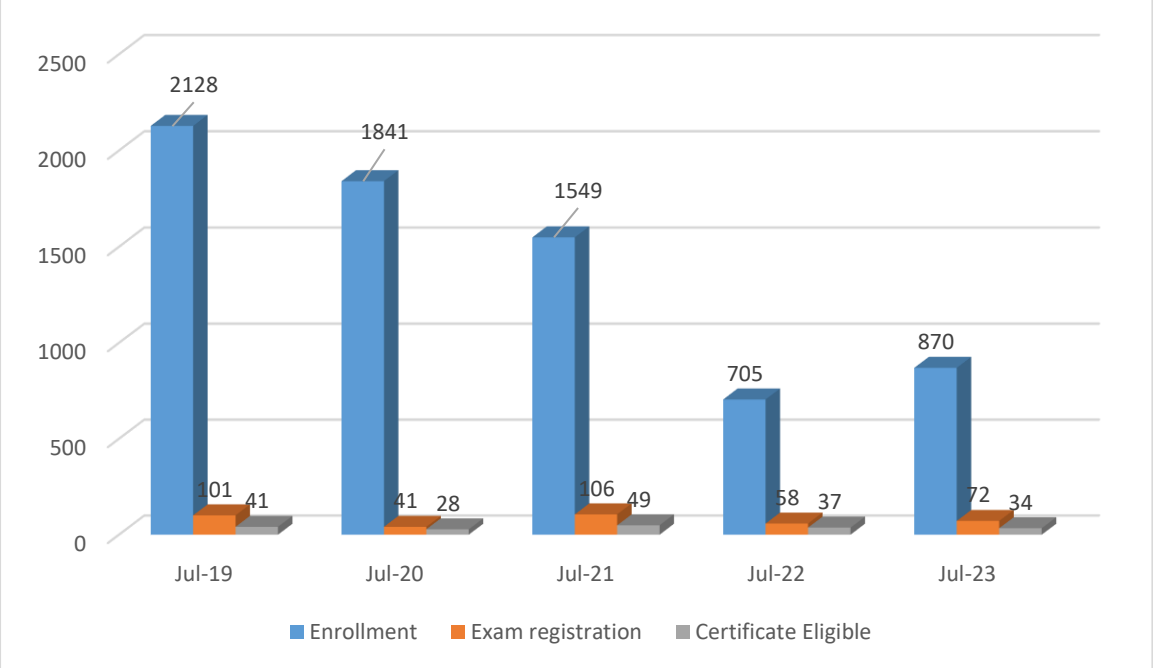
Prof. Saurabh Basu
Physics

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

The course contains very important aspects of modern-day course curriculum, namely, numerical methods and simulation techniques that are going to be of utmost importance to both undergraduate and graduate level. Most of the real-life problems are unsolvable using known analytic techniques, thus depending on numerical methods is imperative. The course introduces basic numerical methods and the key simulation techniques that are going to be useful to academia and industry alike. Even if the software packages, such as Mathematica, Mat lab etc. are available for most of the numeric computations, yet one should be aware of the techniques that are inbuilt into the software.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2019	New	2128	101	41
Sep-Nov 2020	Rerun	1841	41	28
Aug-Oct 2021	Rerun	1549	106	49
Jul-Dec 2022	Rerun	705	58	37
Jul-Sep 2023	Rerun	870	72	34



Plastic Working of Metallic Materials

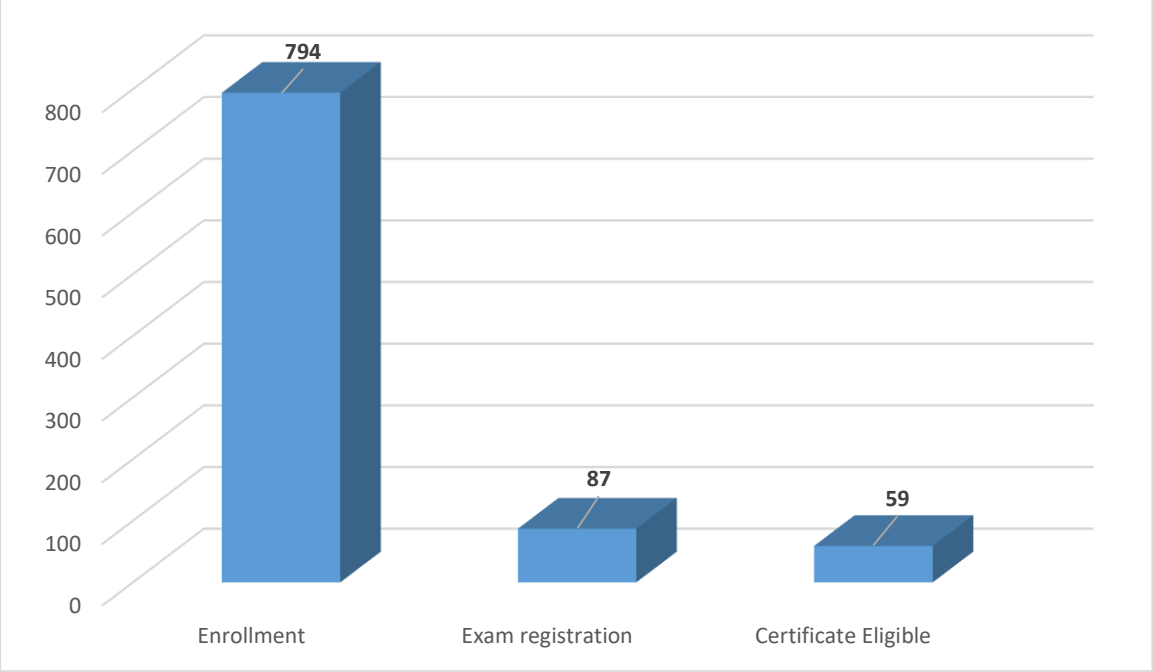
Prof. P. S. Robi
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

Plastic working of metallic materials in an important subject area for applications like automobiles, aircraft, defense, construction, domestic use, etc. This course is developed for a variety of audience viz., undergraduate as well as post graduate students of Mechanical Engineering and Metallurgical Engineering, as well as practicing engineers and technocrats. The course begins with the fundamentals of metal working and slowly moves to advanced analysis of metalworking. Most of the conventional metal working processes has been discussed highlighting the equipment's used, the industrial processes and detailed analysis of the particular processes. After attending this course, the participant will be fully conversant with the conventional deformation processing techniques practiced by the present-day metal industries.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	794	87	59



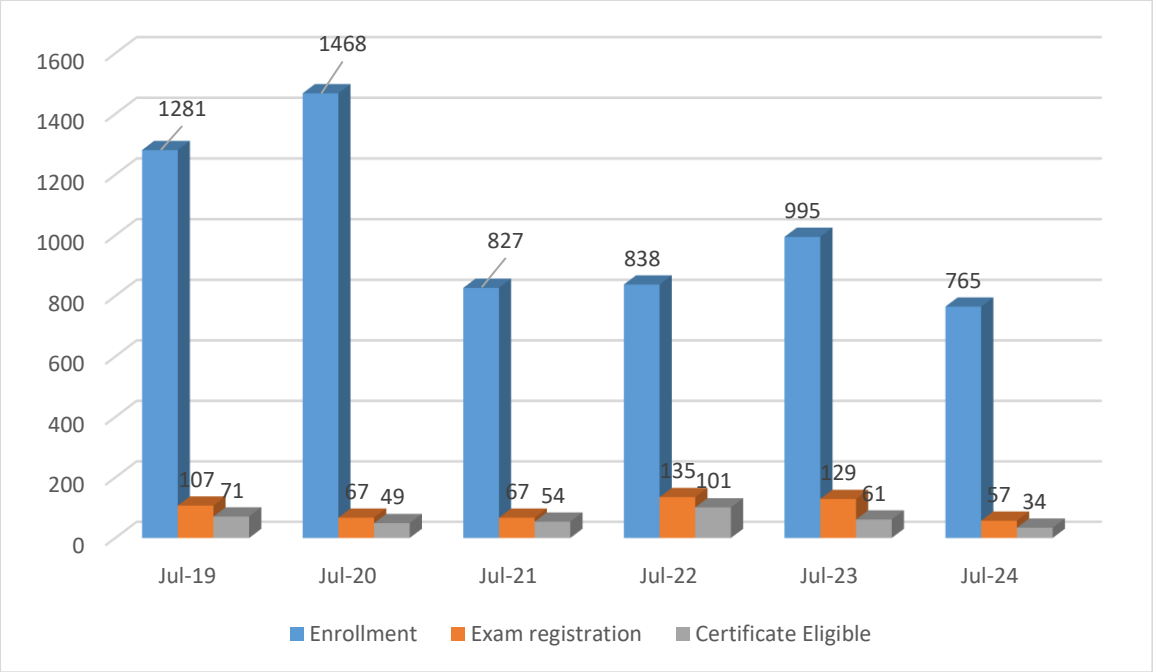
Prof. T. Punniyamurthy
Chemistry

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

The course has nine modules starting from the formation of acid-catalyzed carbon-carbon bond formation to application of the modern transition metal catalysis. Students of graduate and post graduate preparing for NET and GATE examination will find this course extremely useful.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	1281	107	71
Sep-Dec 2020	Rerun	1468	67	49
Jul-Oct 2021	Rerun	827	67	54
Jul-Dec 2022	Rerun	838	135	101
Jul-Oct 2023	Rerun	995	129	61
Jul-Oct 2024	Rerun	765	57	34



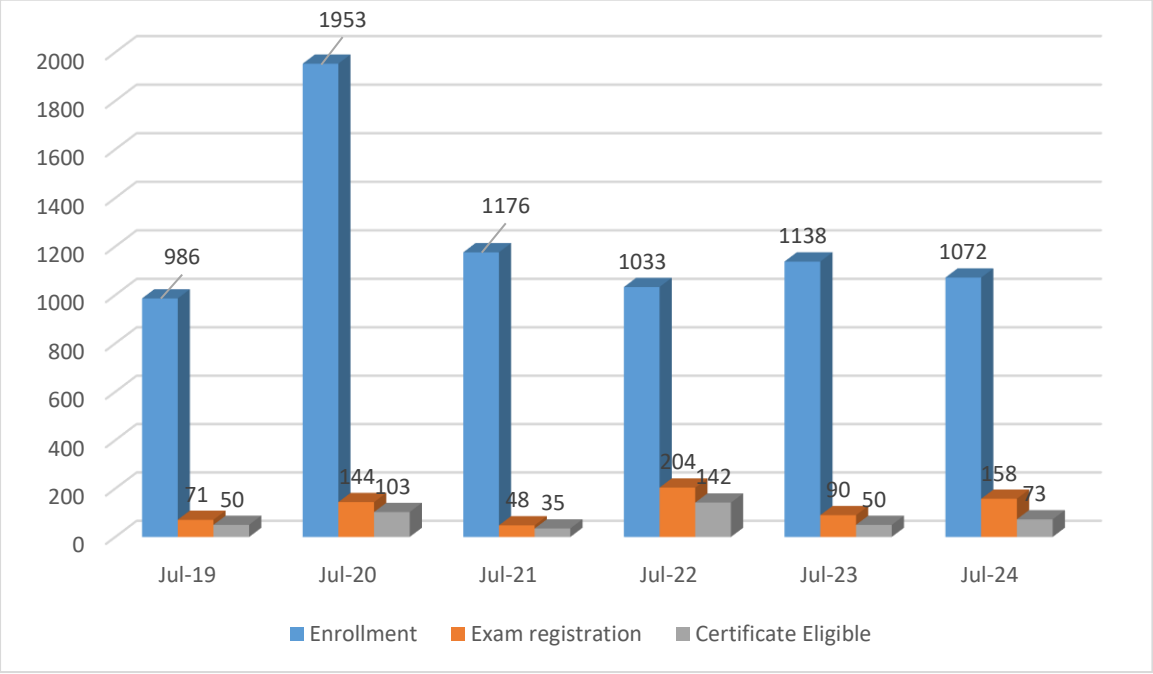
Prof. Subhas Chandra Pan
Chemistry

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course will deal with the various synthetic strategies using organic reagents. Both classical and modern reagents shall be discussed emphasizing on the mechanistic details. This course shall useful to students of undergraduate, post graduate and Ph.D. Students preparing for NET and GATE examination will find this course extremely useful.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	986	71	50
Sep-Dec 2020	Rerun	1953	144	103
Jul-Oct 2021	Rerun	1176	48	35
Jul-Dec 2022	Rerun	1033	204	142
Jul-Oct 2023	Rerun	1138	90	50
Jul-Oct 2024	Rerun	1072	158	73



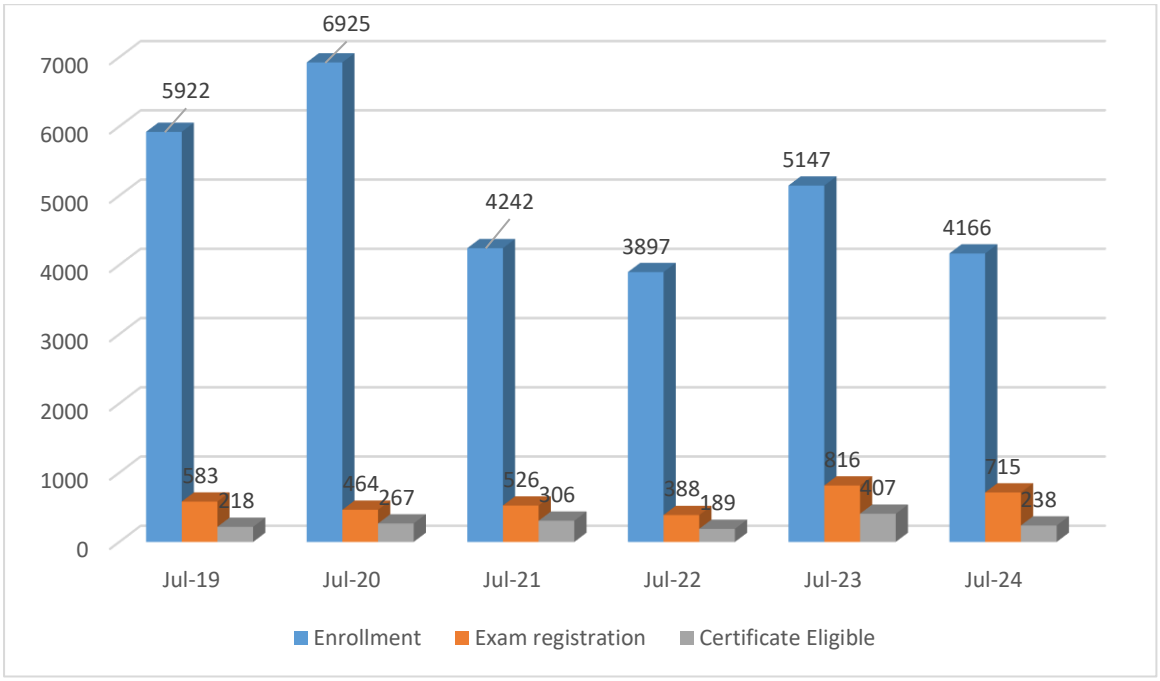
Prof. Rishikesh Bharti
Civil Engineering

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

This course will introduce the students to the state-of-the-art concepts and practices of remote sensing and GIS. It starts with the fundamentals of remote sensing and GIS and subsequently advanced methods will be covered. This course is designed to give comprehensive understanding on the application of remote sensing and GIS in solving the research problems. Upon completion, the participants should be able to use remote sensing (Satellite images and Field data) and GIS in their future research work.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2019	New	5922	583	218
Sep-Nov 2020	Rerun	6925	464	267
Jul-Sep 2021	Rerun	4242	526	306
Jul-Dec 2022	Rerun	3897	388	189
Jul-Sep 2023	Rerun	5147	816	407
Jul-Sep 2024	Rerun	4166	715	238



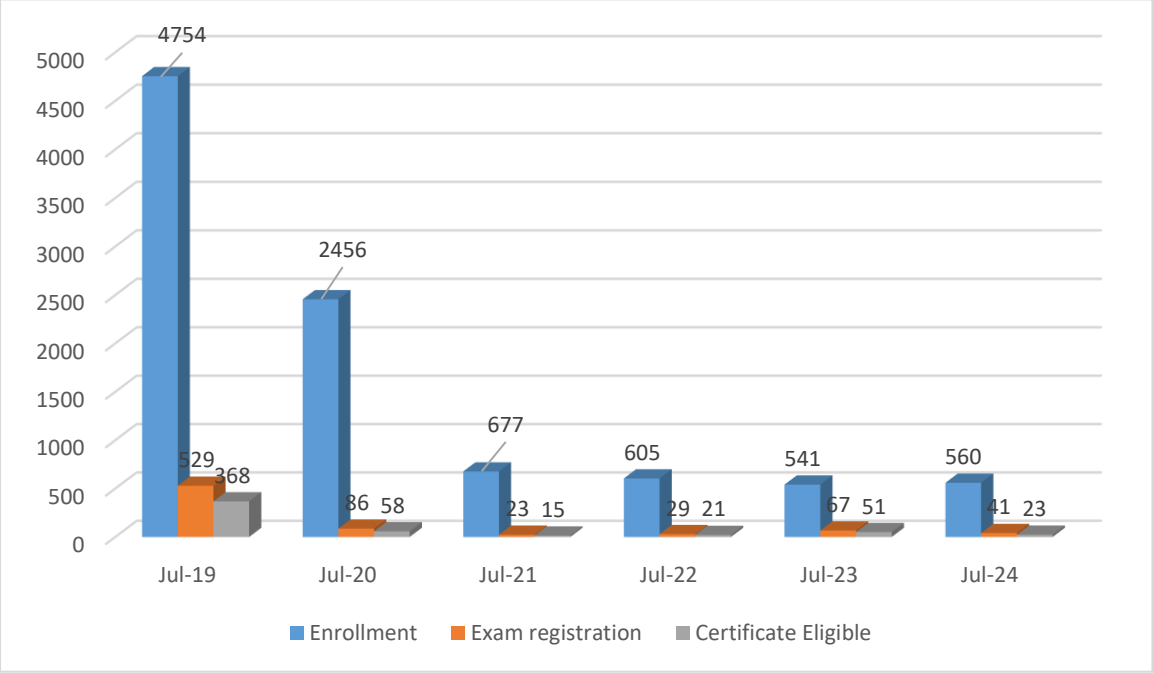
Prof. Vinayak N. Kulkarni
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

This course deals with the steam power plants. One part of the course is about simple steam power cycle, reheat, regeneration and superheating. Further actual cycle with component efficiencies would also be discussed. Then each component of the plant is discussed detail. Initially, types of steam generators and their parts highlighted. Then steam turbine, its type, efficiency and arrangements are focused. Thus, this course would provide an understanding on electricity generation or transportation application using steam as working medium.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2019	New	4754	529	368
Sep-Nov 2020	Rerun	2456	86	58
Jul-Sep 2021	Rerun	677	23	15
Jul-Dec 2022	Rerun	605	29	21
Jul-Oct 2023	Rerun	541	67	51
Jul-Oct 2024	Rerun	560	41	23



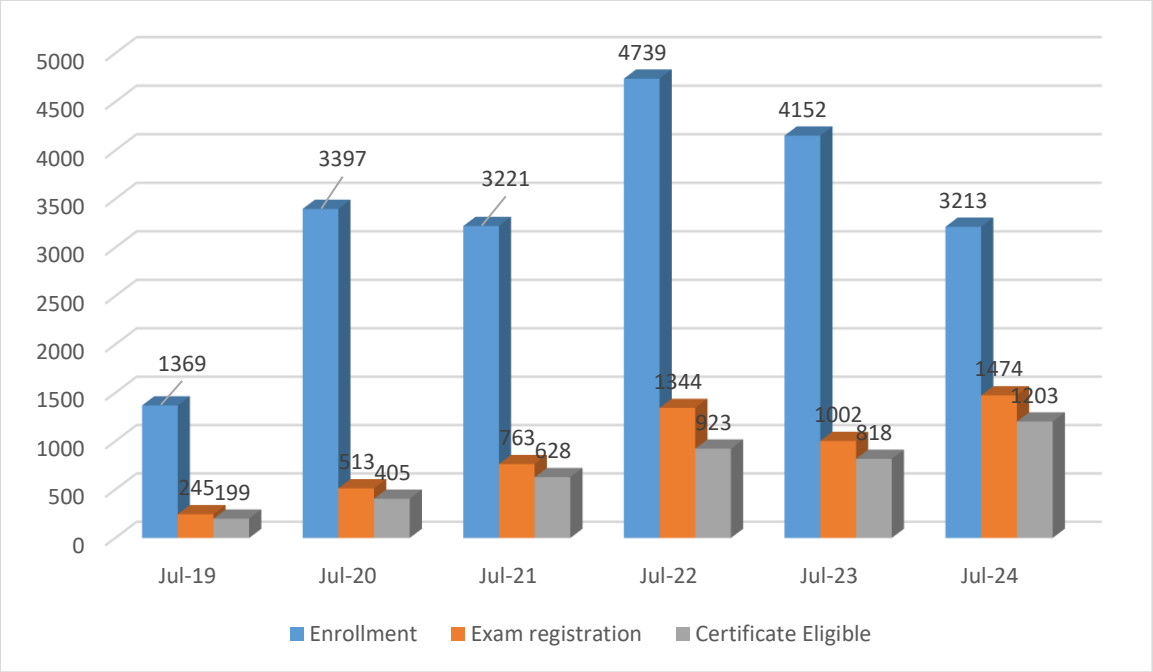
Prof. Naveen Kashyap
Humanities and Social Sciences

Type of the course: New, July 2019 run Duration: 8 weeks

Course Outline:

The very basic form of exchanging information between two living beings is termed as communication. A highly developed form of communication is language, which is used mostly by human beings. The present course will introduce the concept of language and the psychology behind the learning and using of language.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2019	New	1369	245	199
Sep-Nov 2020	Rerun	3397	513	405
Aug-Oct 2021	Rerun	3221	763	628
Jul-Dec 2022	Rerun	4739	1344	923
Jul-Oct 2023	Rerun	4152	1002	818
Jul-Sep 2024	Rerun as Repeat	3213	1474	1203



Prof. Charudatt Kadolkar
Physics

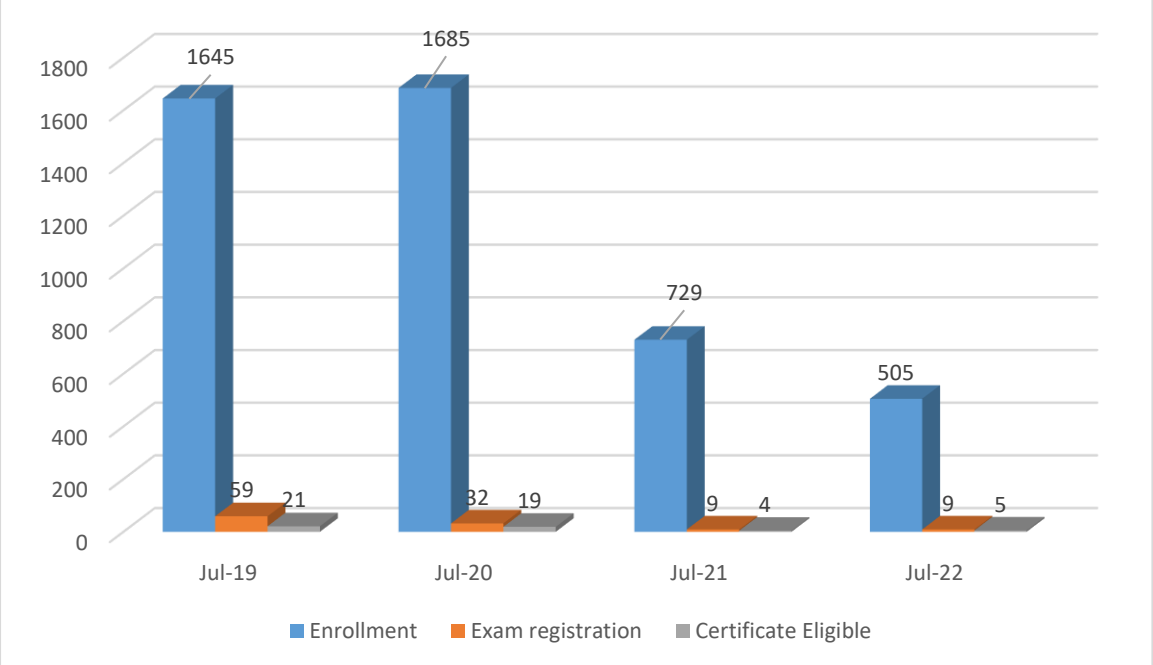
Type of the course: New, July 2019 run Duration: 8 weeks

Type of the course: 20 Hrs. Re-run + 10 Hrs New, July 2020 run
Duration: 12 weeks

Course Outline:

This course has been designed based on the syllabus of a typical master's level at universities. It primarily focuses on analytical aspects of classical mechanics and is targeted towards the audience who are interested in pursuing research in Physics. Various formulations of mechanics, like the Lagrangian formulation, the Hamiltonian formulation, the Poisson bracket formulation will be taught in the course. The course also includes the applications of these formulations to central force problems, rigid body motion and small oscillations.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2019	New	1645	59	21
Sep-Dec 2020	Rerun	1685	32	19
Jul-Oct 2021	Rerun	729	9	4
Jul-Dec 2022	Rerun	505	9	5



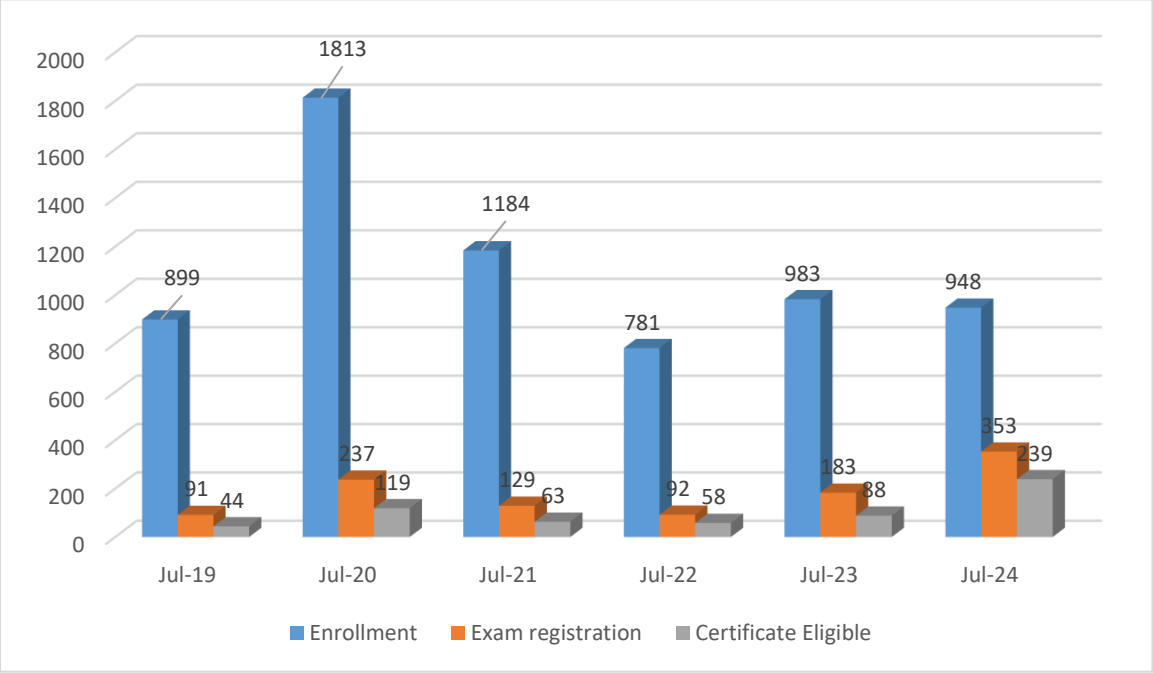
Prof. R. Anandalakshmi
Chemical Engineering

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

The Food and Agriculture Organization (FAO) of the United Nations (UN) issued a report on the importance and complexities associated with feeding the projected 9.1 billion world population in 2050. Sustainable production of safe and nutritious foods, development of foods that have a long shelf life and foods that are either ready-to-eat or easy to are of greater importance towards meeting this goal. Understanding "Food Engineering" and "Thermal Processing of Foods" serves as basic requirement means of meeting this goal.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	899	91	44
Sep-Dec 2020	Rerun	1813	237	119
Jul-Oct 2021	Rerun	1184	129	63
Jul-Dec 2022	Rerun	781	92	58
Jul-Oct 2023	Rerun	983	183	88
Jul-Oct 2024	Rerun	948	353	239



Thermodynamics: Classical to Statistical

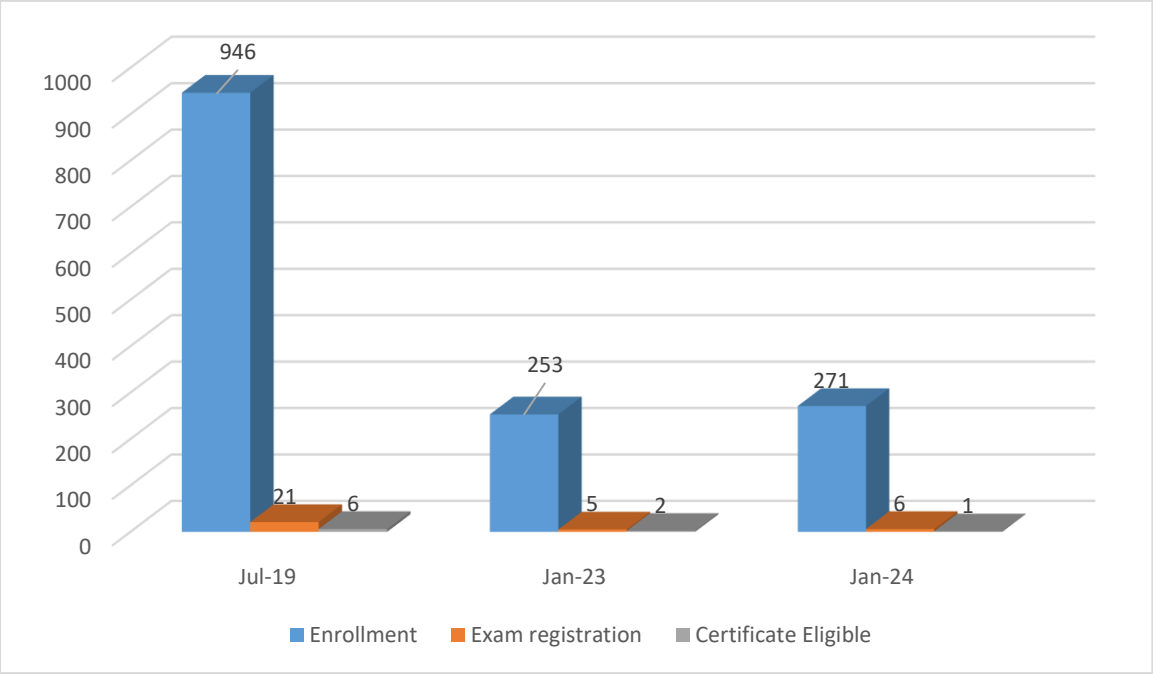
Prof. Sandip Paul
Chemistry

Type of the course: New, July 2019 run Duration: 12 weeks

Course Outline:

This course is intended for final year BSc (in Chemistry) as well as for MSc (in Chemistry) and PhD (in Chemistry) students and it is assumed that no previous knowledge of the subject is required. Moreover, this course demonstrates the form physical and statistical basis of thermodynamics by showing how the properties of macroscopic systems are direct consequences of the behaviors of their elementary constituents. Thus, this course will give the students a broader spectrum of skills as well as a better understanding of the physical bases.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2019	New	946	21	6
Jan-Apr 2023	Rerun	253	5	2
Jan-Apr 2024	Repeat	271	6	1



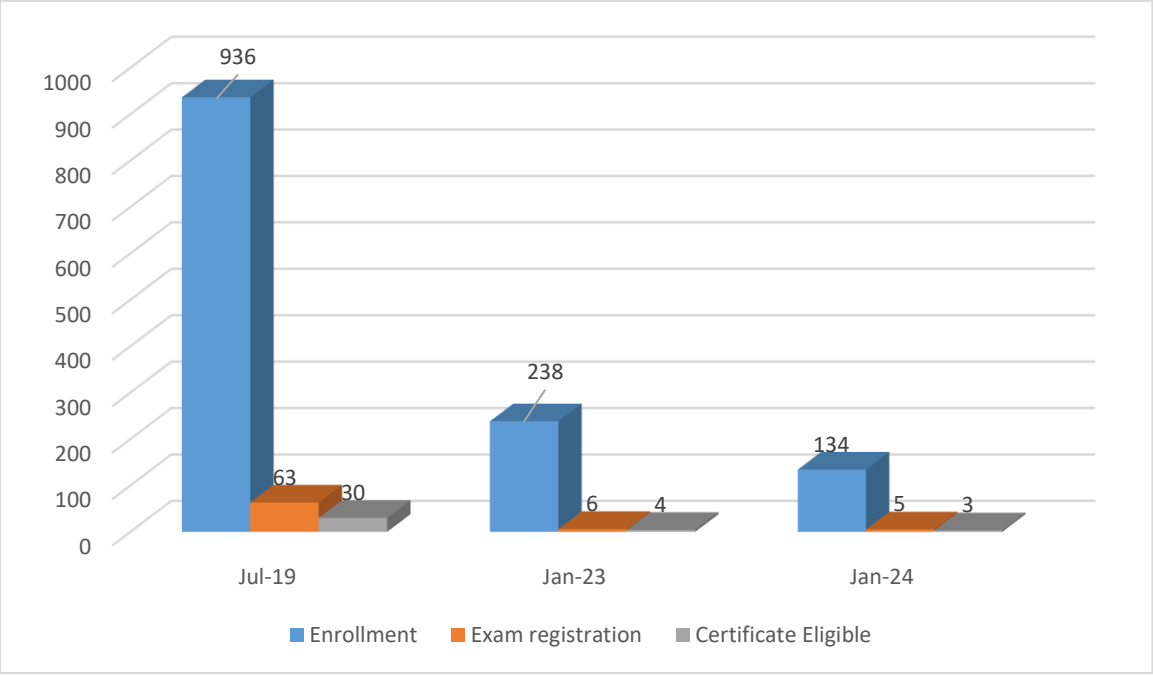
Prof. Manmohan Pandey
Mechanical Engineering

Type of the course: New, July 2019 run Duration: 4 weeks

Course Outline:

Gas-liquid flows occur in various industrial applications, such as power generation, refrigeration, oil & gas production, and thermal management of future electronic devices. In this course, one-dimensional models of two-phase flow with and without phase change will be introduced. Methods of pressure drop prediction for adiabatic gas-liquid flow as well as flow boiling will be discussed. Special methods for pressure drop modeling of two-phase flow in miniature channels will also be introduced.

Timeline	Type	Enrolled	Registered	Certified
Aug-Sep 2019	New	936	63	30
Jan-Apr 2023	Rerun	238	6	4
Jan-Mar 2024	Repeat	134	5	3



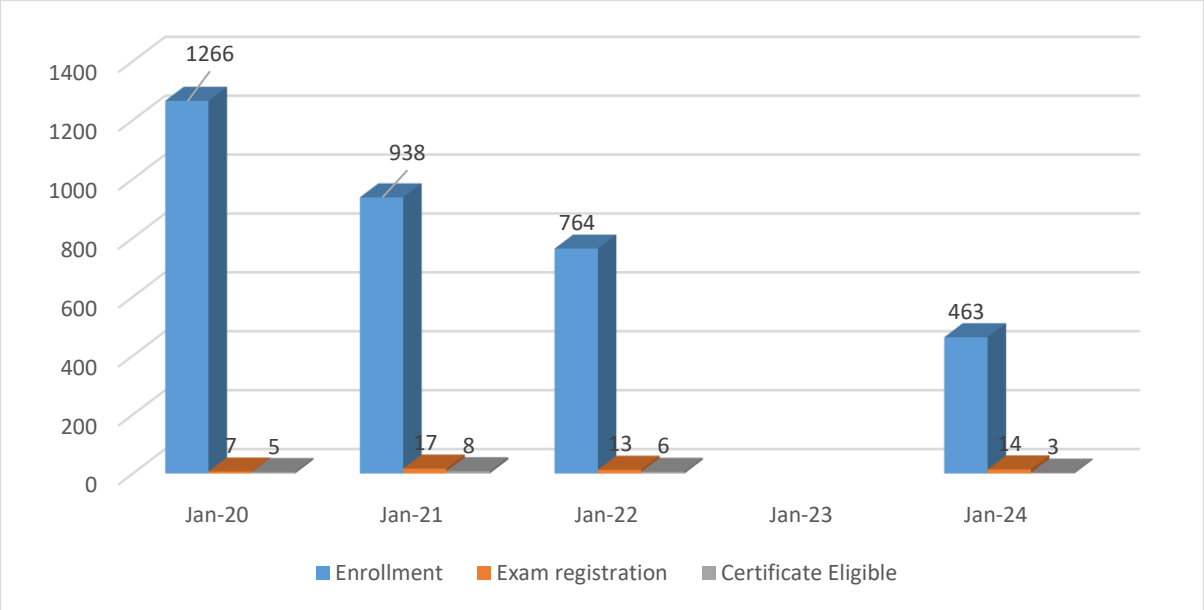
Prof. Nanda Kishore
Chemical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

In any chemical process, often one encounter interaction between phases where transfer of species takes place from one phase to other. That is there exist several situations of vapor-liquid, liquid-liquid, vapor-liquid-liquid, solid-liquid equilibria in chemical engineering processes. Often these situations are dealt with assumption of ideal behavior and binary systems but in reality, non-ideality and multicomponent mixtures exists and accordingly one has to deal with such situations. This course offers step-by-step understanding of required thermodynamic properties to handle such equilibrium cases and explore possible ways of solving problems associated with non-ideality in VLE, LLE, VLLE and SLE for multicomponent mixtures.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	1266	7	5
Jan-Apr 2021	Rerun	938	17	8
Jan-Apr 2022	Rerun	764	13	6
Jan-Apr 2024	Repeat	463	14	3



Basic Principles and Calculations in Chemical Engineering

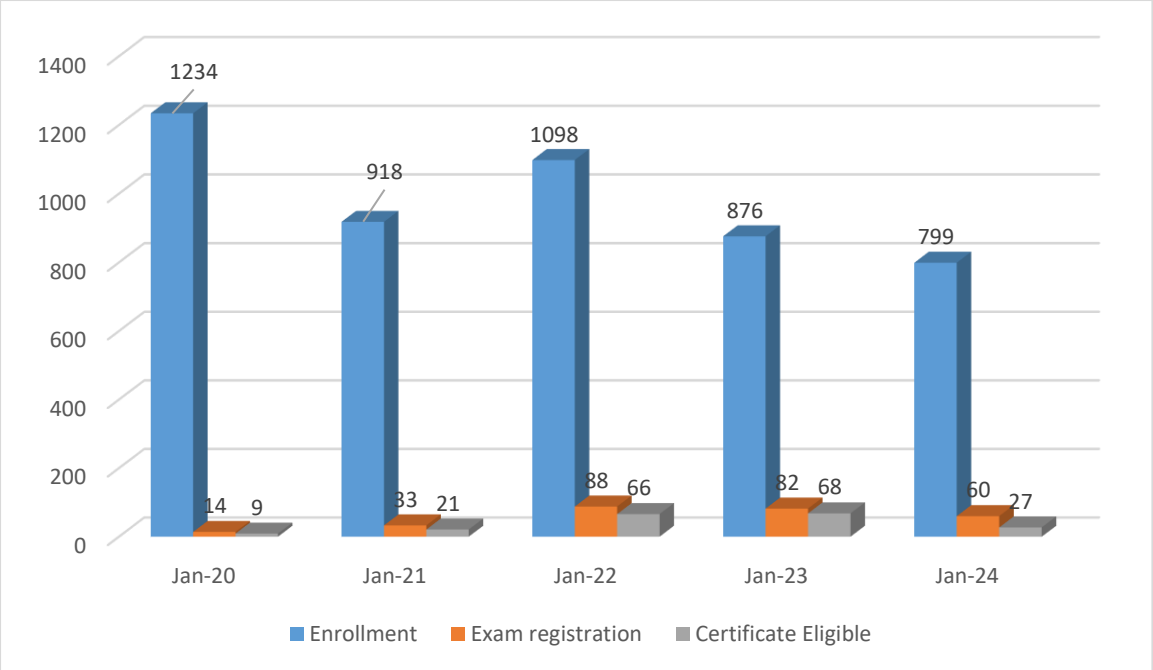
Prof. Subrata Kumar Majumdar
Chemical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

The Objective of the course is to introduce chemical engineering students to the basic principles and calculation techniques used in the chemical industries and to acquaint them with the fundamentals of the material and energy balances as applied to chemical engineering. The course is mainly intended for graduate chemical engineers. It will expose them to problems in material and energy balances that arise in relation to the problems involving chemical reactors. It also will introduce them to numerical methods used to solve the problems with simple software packages. The course will introduce in simple language and ample of examples so that it will encourage learners to get used to the course.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	1234	14	9
Jan-Apr 2021	Rerun	918	33	21
Jan-Apr 2022	Rerun	1098	88	66
Jan-Apr 2023	Rerun	876	82	68
Jan-Apr 2024	Repeat	799	60	27



Computational Fluid Dynamics for Incompressible Flows

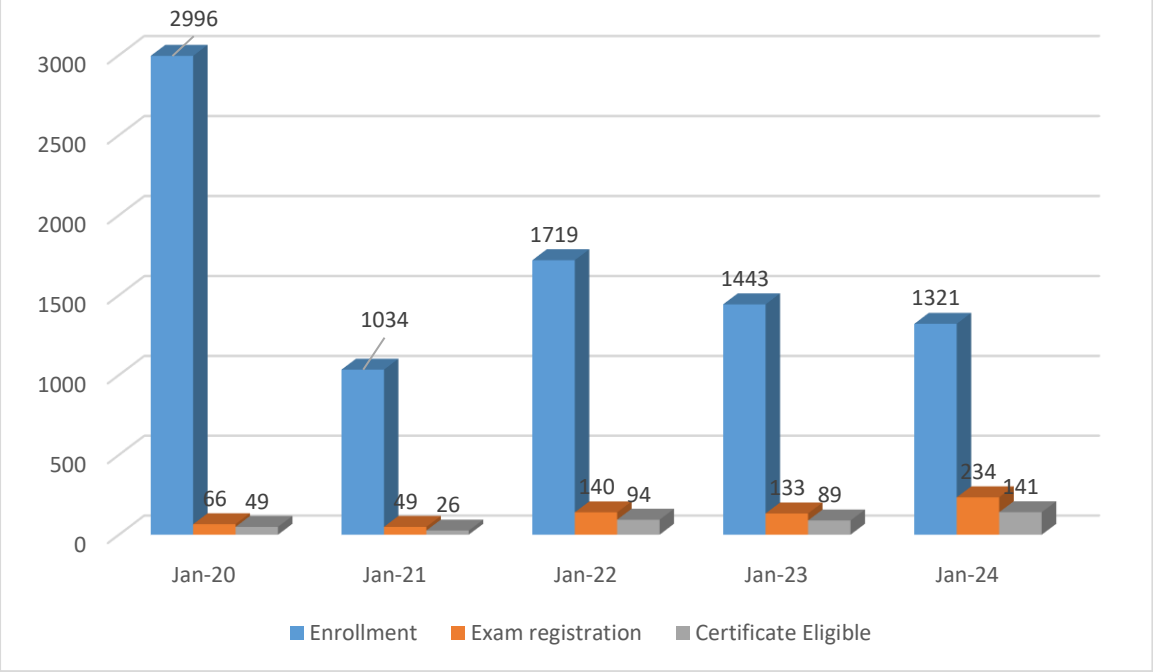
Prof. Amaresh Dalal
Mechanical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

This is introductory course on computational fluid dynamics (CFD). This course will primarily cover the basics of computational fluid dynamics starting from classification of partial differential equations, linear solvers, finite difference method and finite volume method for discretizing Laplace equation, convective-diffusive equation & Navier-Stokes equations. The course will help faculty members, students and researchers in the field to get an overview of the concepts in CFD.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	2996	66	49
Jan-Apr 2021	Rerun	1034	49	26
Jan-Apr 2022	Rerun	1719	140	94
Jan-Apr 2023	Rerun	1443	133	89
Jan-Apr 2024	Repeat	1321	234	141



Computer Aided Applied Single Objective Optimization

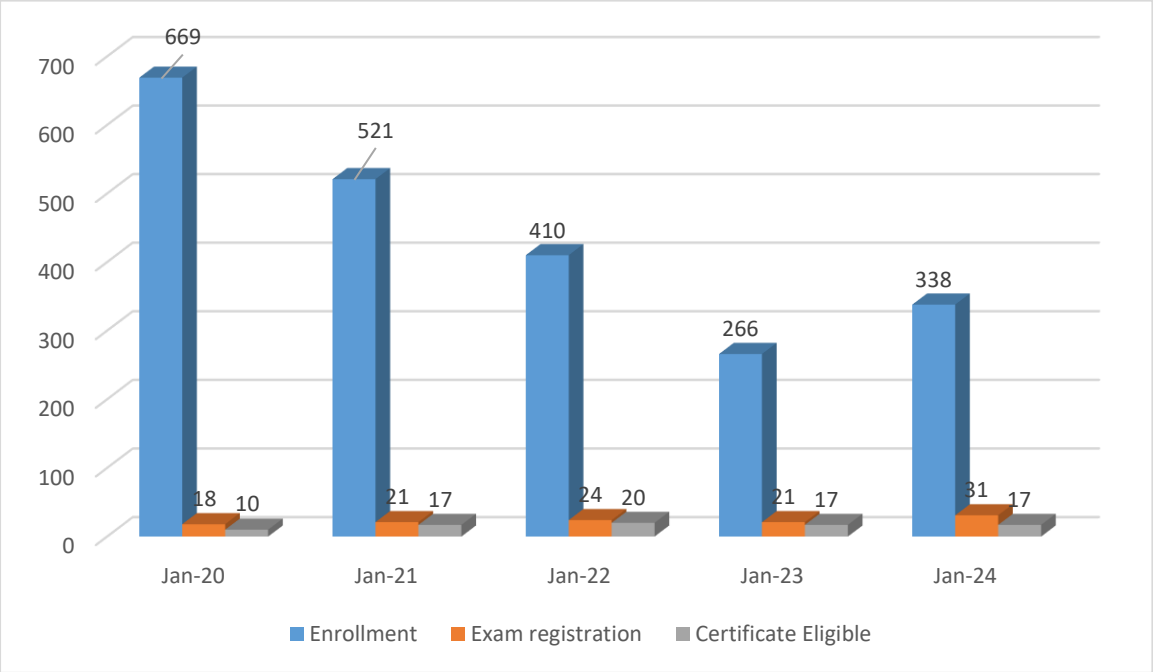
Prof. Prakash Kotecha
Chemical Engineering

Type of the course: New, Jan 2020 run Duration: 8 weeks

Course Outline:

Optimization problems are frequently encountered in almost all disciplines of science and engineering. This course will familiarize the audience with both mathematical and computational intelligence algorithms to solve combinatorial optimization problems. The course is designed so as to enable the participants to quickly use state-of-the-art tools to solve optimization problems. A unique feature of this course will be discussion of a realistic case study to thoroughly understand various aspects of optimization.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2020	New	669	18	10
Jan-Apr 2021	Rerun	521	21	17
Jan-Apr 2022	Rerun	410	24	20
Jan-Apr 2023	Rerun	266	21	17
Jan-Apr 2024	Repeat	338	31	17



Essentials of Biomolecules: Nucleic Acids and Peptides

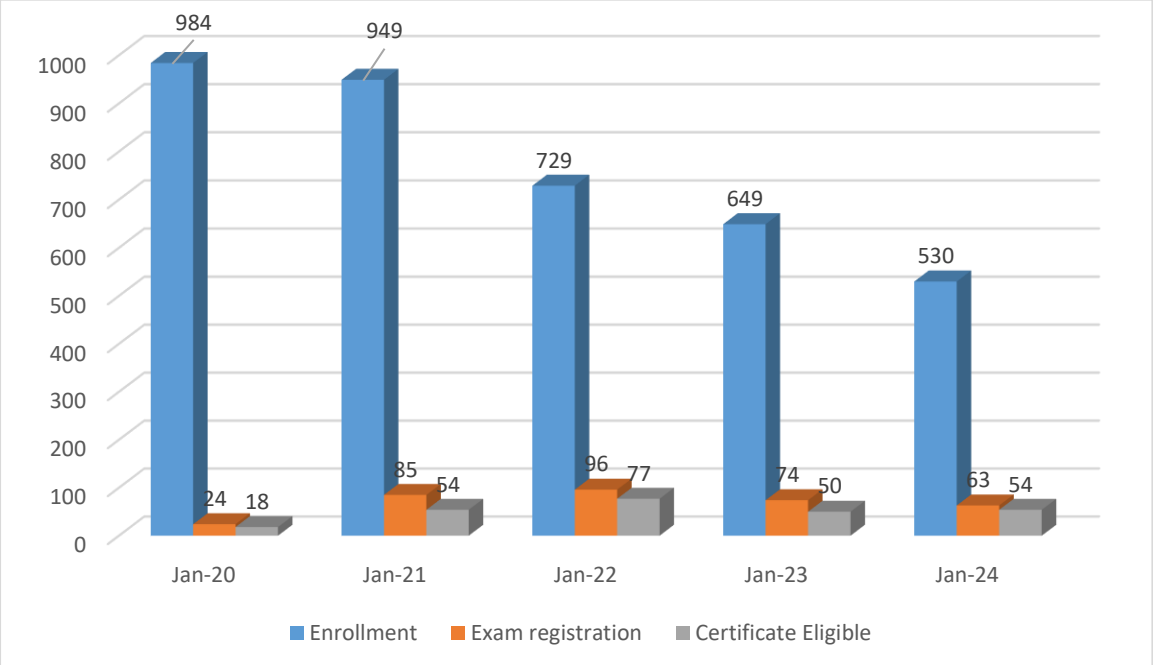
Prof. Lal Mohan Kundu
Chemistry

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

The proposed course aims to provide essentials of chemistry and biology of two very important class of biomolecules: nucleic acids (DNA/RNA) and proteins. The course allows to decipher: how structural features are translated into biological functions; how highly organized and selective chemical reactions are adopted that allows DNA to replicate or dictates step-wise synthesis of specific sequence of proteins; how organic chemistry tools in combination with enzymes were ingeniously applied to determine sequences of DNA and proteins and how chemical modifications could be done to mimic similar biological properties. The course also includes modern techniques, development of biomolecular probes as high-throughput detection of biomolecules, single nucleotide polymorphisms and disease diagnosis. Overall, the course falls within the domain of organic chemistry and chemical biology.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	984	24	18
Jan-Apr 2021	Rerun	949	85	54
Jan-Apr 2022	Rerun	729	96	77
Jan-Apr 2023	Rerun	649	74	50
Jan-Apr 2024	Repeat	530	63	54



Experimental Methods in Fluid Mechanics

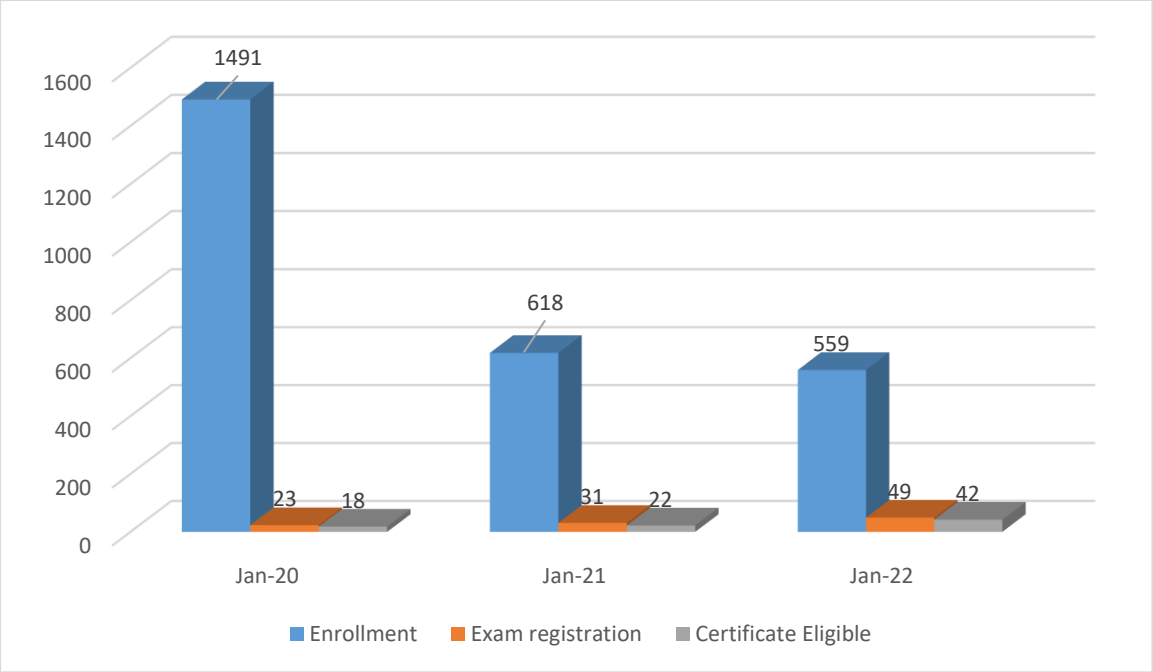
Prof. Pranab K. Mondal
Mechanical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

This course deals with the experimental techniques in Fluid Mechanics. One part of the course focuses on different techniques and challenges associated with the measurement of flow features. Other part of the course has emphasis on the statistical analysis of experimental data. Thus, this course would provide an understanding on several experimental methods in Fluid Mechanics and would unveil hypotheses concerning with the cause-and-effect relationships. It represents the most valid approach to the solution of theoretical advancement in the field.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	1491	23	18
Jan-Apr 2021	Rerun	618	31	22
Jan-Apr 2022	Rerun	559	49	42



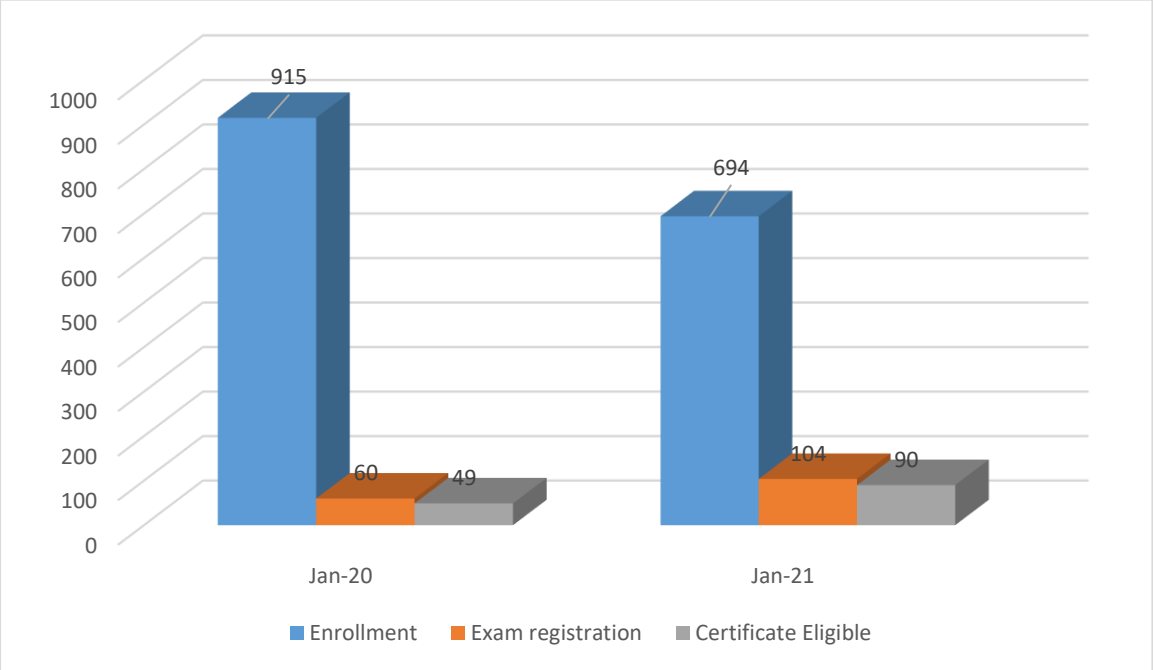
Prof. Vipul Dutta
Humanities and Social Sciences

Type of the course: New, Jan 2020 run Duration: 8 weeks

Course Outline:

This course will familiarise students with the modern history of the evolution of businesses in the Indian subcontinent during the twentieth century. It will discuss case studies of businesses and industries to highlight the multi-faceted history of entrepreneurship in India at the turn of the twentieth century ranging from post-Independence banking history to liberal reforms of the 1990s. It will examine the history of major Indian industrial houses as well as the use of financial diplomacy as an instrument of India's foreign policy after 1947. The course will highlight the historical nature of policies that shaped Indian business cultures in the wider socio-political landscape.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2020	New	915	60	49
Jan-Mar 2021	Rerun	694	104	90



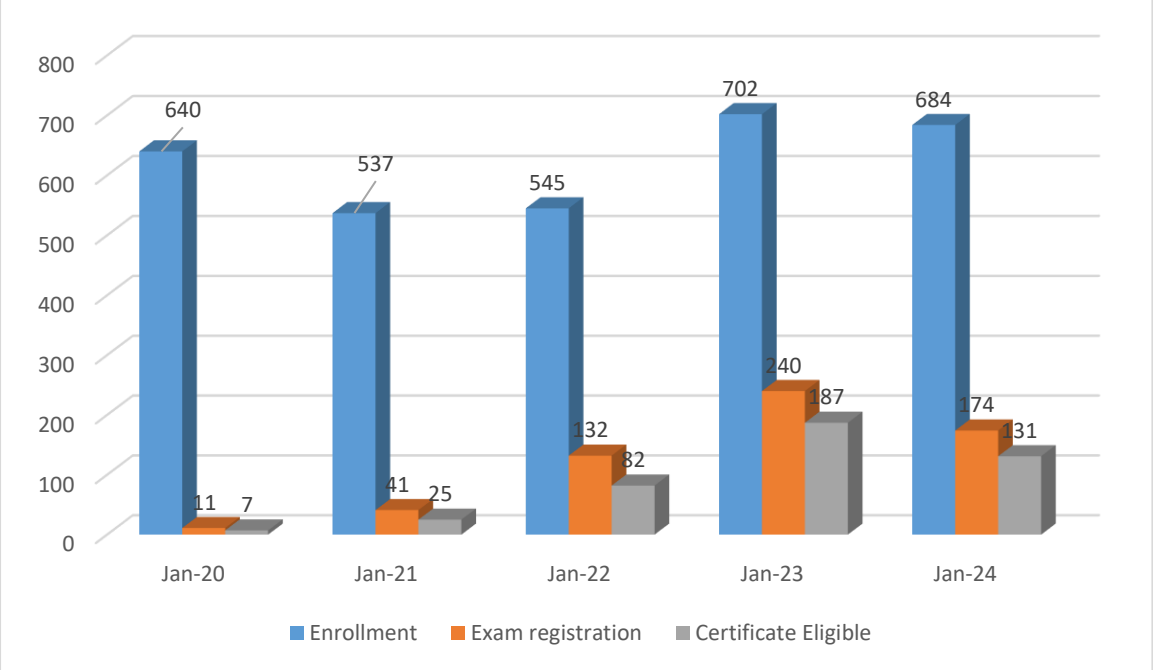
Prof. Kaustubha Mohanty
Chemical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

This course will provide an insight to the membrane-based separations that is an integral part of the down-stream processing of various industries. The course begins with introducing the development of membranes and discussing the basics which is followed by detail discussion on membrane materials and their properties. This course then deals with various methods of membrane preparations and their characterization. How separations (transport mechanism) takes places using membranes has been covered extensively. Further, principles of various membrane processes such as reverse osmosis, microfiltration, ultrafiltration, dialysis, liquid membrane, pervaporation etc. has been covered along with their applications in different industries. The course will enable students to develop necessary skills to design appropriate membrane-based separation technique as per the need.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	640	11	7
Jan-Apr 2021	Rerun	537	41	25
Jan-Apr 2022	Rerun	545	132	82
Jan-Apr 2023	Rerun	702	240	187
Jan-Apr 2024	Rerun	684	174	131



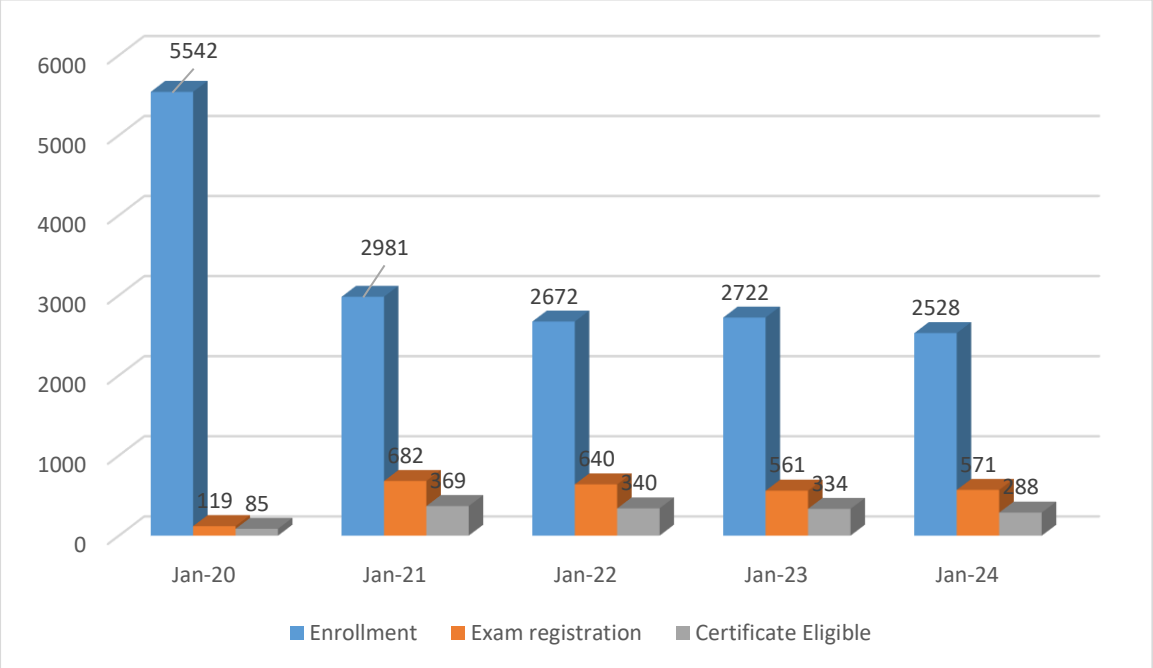
Prof. Shaik Rafi Ahamed
Electronics and Electrical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

Initially, an overview of 8086 microprocessors will be covered. Comparison with 8-bit processor will be discussed. Later, the detailed architecture 0f 8086 will be discussed. The 8086 instructions will be covered with examples. Simple to complex programs using 8086 assembly language will be discussed. A peripheral device 8255 will be discussed in detail. Then, the interfacing of 8086 with several peripherals such as key board, display, stepper motor will be covered.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	5542	119	85
Jan-Apr 2021	Rerun	2981	682	369
Jan-Apr 2022	Rerun	2672	640	340
Jan-Apr 2023	Rerun	2722	561	334
Jan-Apr 2024	Rerun	2528	571	288



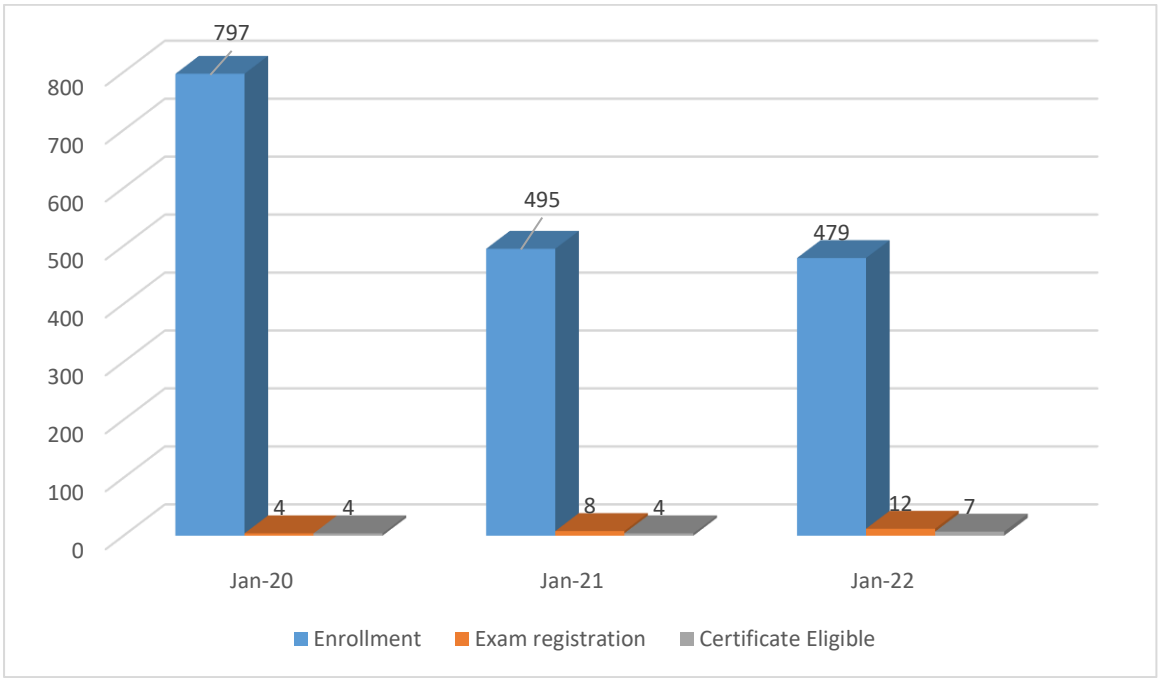
Prof. Prabin Kumar Bora
Electronics and Electrical Engineering

Type of the course: New, Jan 2020 run Duration: 12 weeks

Course Outline:

Many practical signals are random in nature or modelled as random processes. Statistical Signal Processing involves processing these signals and forms the backbone of modern communication and signal processing systems. This course will the three broad components of statistical signal processing: random signal modelling, estimation theory and detection theory.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2020	New	797	4	4
Jan-Apr 2021	Rerun	495	8	4
Jan-Apr 2022	Rerun	479	12	7



User-centric Computing for Human-Computer Interaction

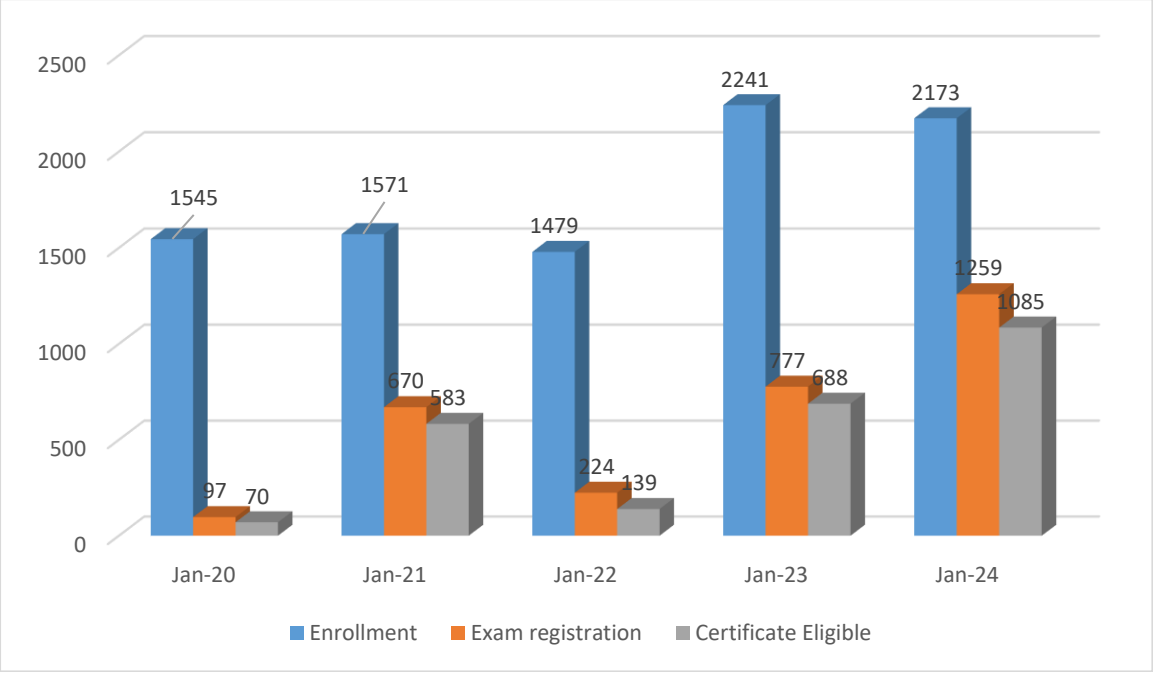
Prof. Samit Bhattacharya
Computer Science and Engineering

Type of the course: New, Jan 2020 run Duration: 8 weeks

Course Outline:

Human-computer interaction is an emerging field of study at present, due to the proliferation of large number of consumer electronic products. The key issue in this field is to make the products usable to lay-persons. In order to do that, we need to take care of the (creative) design aspects (the look-and-feel of the interface) and also the system design aspect (both software and hardware). The field is interdisciplinary with inputs required from various other fields. However, the computer science and engineering plays the central role in the design of such systems (as per SIGCHI of ACM). In this course, we will introduce the engineering and computational issues in the design of human-computer interfaces for laypersons. The topics covered in the course includes the engineering life cycles for design of interactive systems, computational design framework (as part of the life cycle), components of the framework including the computational models of users and systems, and evaluation of such systems (with or without users).

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2020	New	1545	97	70
Jan-Mar 2021	Rerun	1571	670	583
Jan-Mar 2022	Rerun	1479	224	139
Jan-Mar 2023	Rerun	2241	777	688
Jan-Mar 2024	Rerun	2173	1259	1085



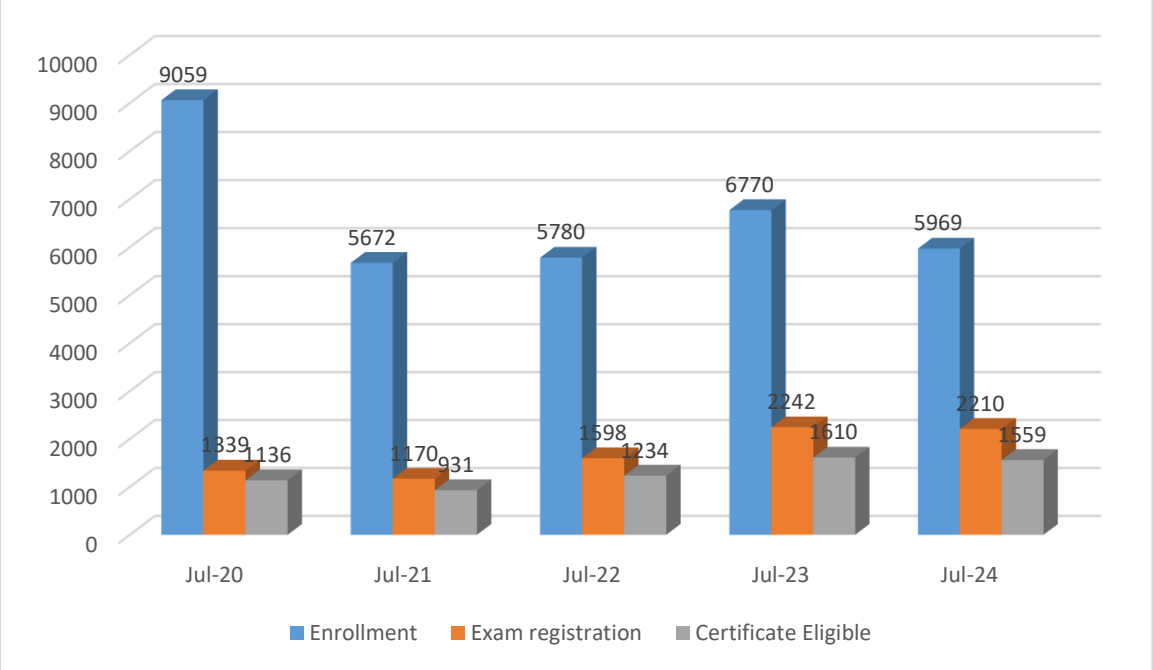
Prof. Shrikrishna N. Joshi
Mechanical Engineering

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

Manufacturing industry contributes a major share in the GDP of our country. Application of automated systems is certainly improving the productivity of the manufacturing industry. In view of this, a course on "Automation in Manufacturing" is designed with the primary focus on the design and development of automated systems in the manufacturing. Initially the course introduces various automated systems being used in the manufacturing industry. Then the building blocks of a typical automated system are described. It presents a study on the principle of operation and construction details of sensors/transducers, actuators, drives and mechanisms, hydraulic and pneumatic systems. It also covers up the microprocessor technology, programming and CNC technology. The contents are lucidly presented with real-life examples. Case studies based on manufacturing industry applications are presented.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	9059	1339	1136
Jul-Oct 2021	Rerun	5672	1170	931
Jul-Dec 2022	Rerun	5780	1598	1234
Jul-Oct 2023	Rerun	6770	2242	1610
Jul-Oct 2024	Rerun	5969	2210	1559



Computational Continuum Mechanics

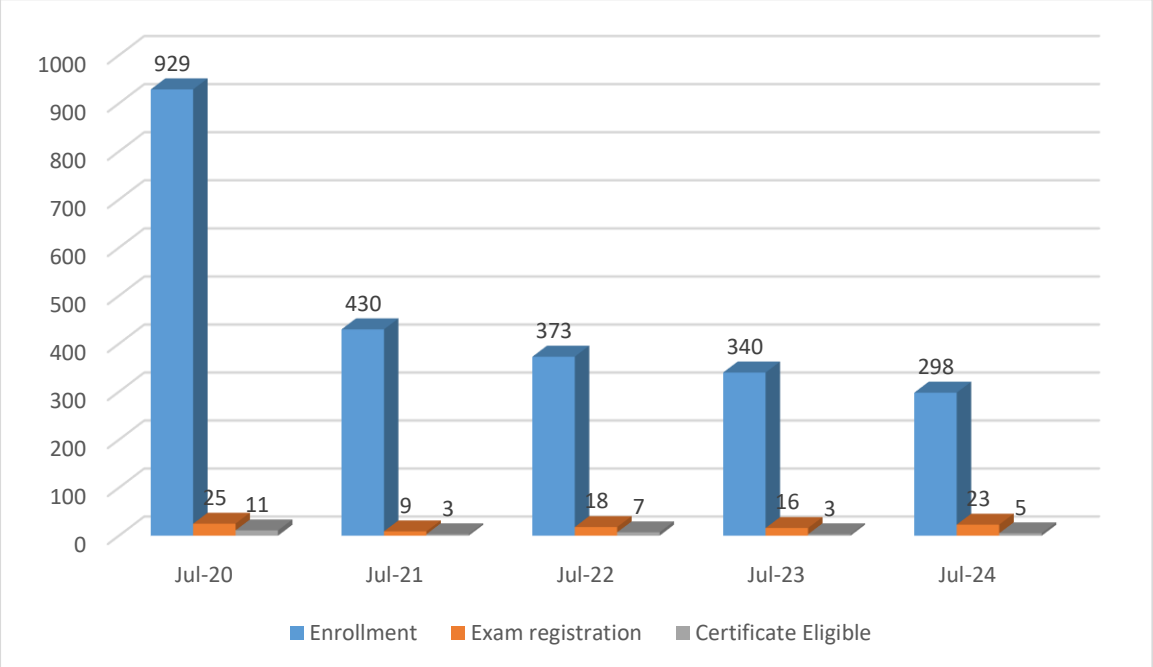
Prof. Sachin Singh Gautam
Mechanical Engineering

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

Continuum mechanics as a full-fledged course is a very interesting but a challenging subject. Usually, its application within the nonlinear finite element codes is not clear to the student. Computational continuum mechanics tries to bridge this gap. Hence, it can be treated as an applied version of continuum mechanics course. It assumes no prior exposure to continuum mechanics. The course starts with sufficient introduction to tensors, kinematics, and kinetics. Then, the course applies these concepts to set up the constitutive relations for nonlinear finite element analysis of a simple hyperelastic material. This is followed by the linearization of the weak form of the equilibrium equations followed by discretization to obtain the finite element equations, in particular, the tangent matrices and residual vectors is discussed. Finally, the Newton-Raphson solution procedure is discussed along with line search and arc length methods to enhance the solution procedure.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	929	25	11
Jul-Oct 2021	Rerun	430	9	3
Jul-Dec 2022	Rerun	373	18	7
Jul-Oct 2023	Rerun	340	16	3
Jul-Oct 2024	Repeat	298	23	5



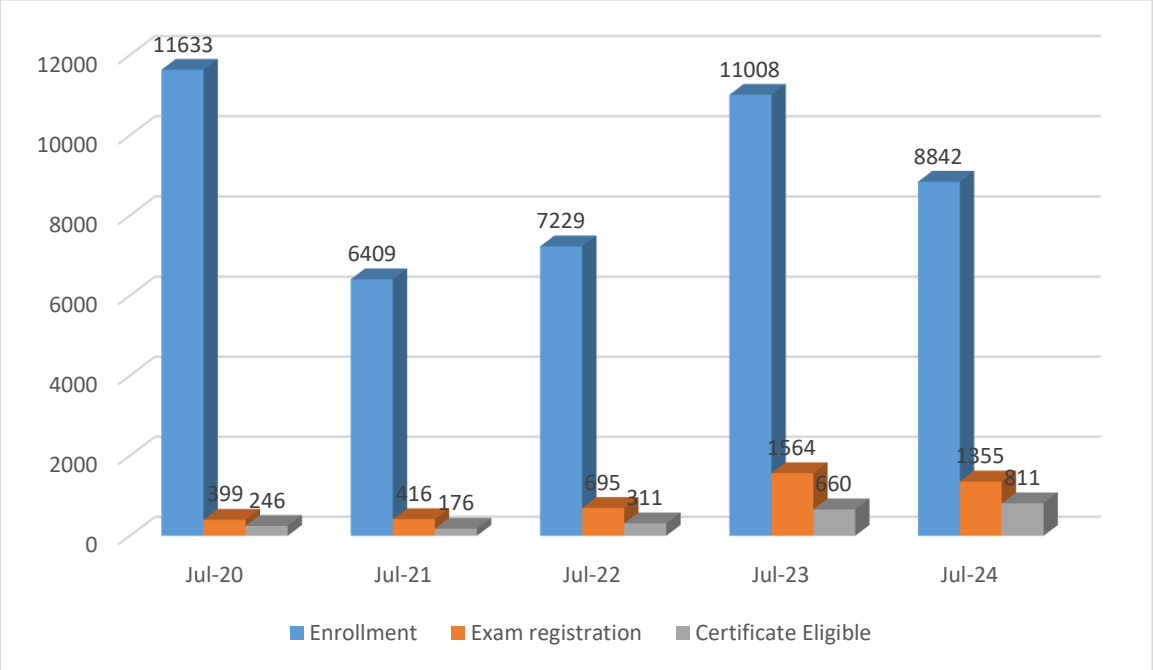
Prof. Samit Bhattacharya
Computer Science and Engineering

Type of the course: New, July 2020 run Duration: 8 weeks

Course Outline:

Computer graphics is one of the fundamental aspects of any computing system. Its primary role is to render the digital content (0's and 1's) in a human-comprehensible form on the computer screen. The rendering follows a series of stages, collectively known as the graphics pipeline. In this course, we will introduce the pipeline and its stages. The topics covered include various object representation techniques followed by the pipeline stages of modeling transformation, 3D to 2D viewing transformation, clipping and hidden surface removal and scan conversion (rendering). We shall follow the stages of the 3D graphics pipeline. In order to complete the coverage, we shall also briefly introduce the present-day graphics hardware (I/O devices, GPU) and the widely popular open GL graphics library.

Timeline	Type	Enrolled	Registered	Certified
Sep-Nov 2020	New	11633	399	246
Jul-Sep 2021	Rerun	6409	416	176
Jul-Dec 2022	Rerun	7229	695	311
Jul-Oct 2023	Rerun	11008	1564	660
Jul-Oct 2024	Rerun	8842	1355	811



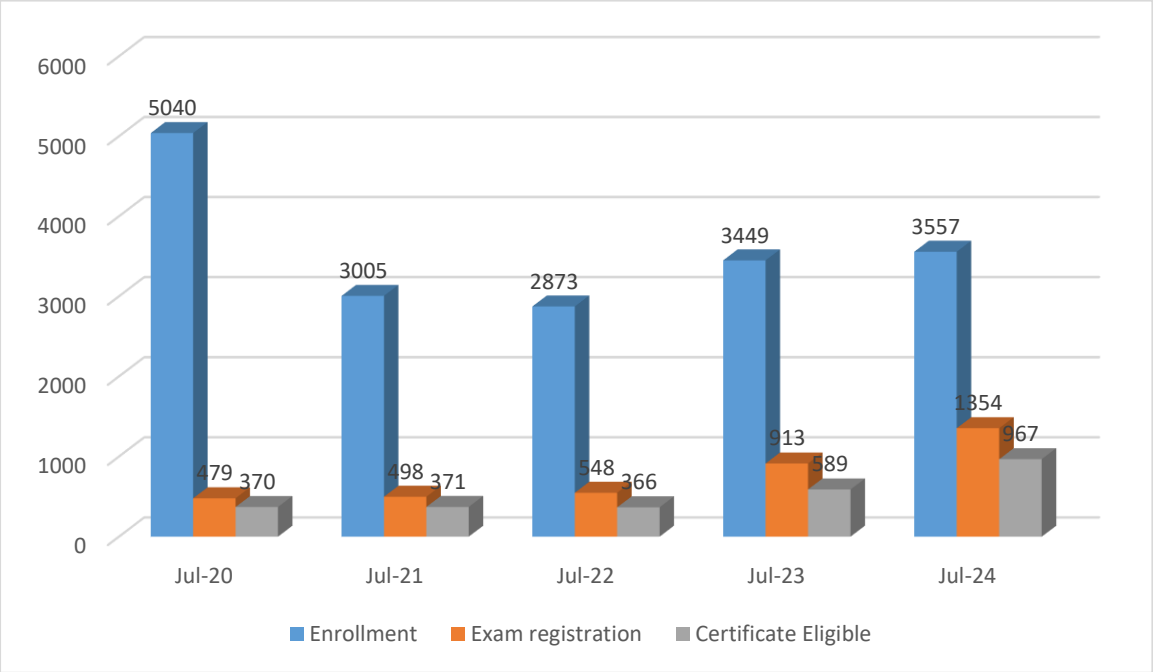
Prof. Vishal Trivedi
Bioscience and Bioengineering

Type of the course: New, July 2020 run Duration: 8 weeks

Course Outline:

In the current MOOCs course, I have put effort to briefly discuss different analytical techniques and their potential in solving the scientific problems. We are taking several scientific problems or questions which can be solved by using these techniques. By the end of this course, student will be able to understand: 1. Basics of Good Lab practices. 2. Understanding different analytical techniques and their applications. 3. Specific Scientific questions and their solutions. 4. Designing new experiments.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	5040	479	370
Jul-Oct 2021	Rerun	3005	498	371
Jul-Dec 2022	Rerun	2873	548	366
Jul-Oct 2023	Rerun	3449	913	589
Jul-Oct 202	Rerun	3557	1354	967



Prof. Atanu Banerjee
Mechanical Engineering

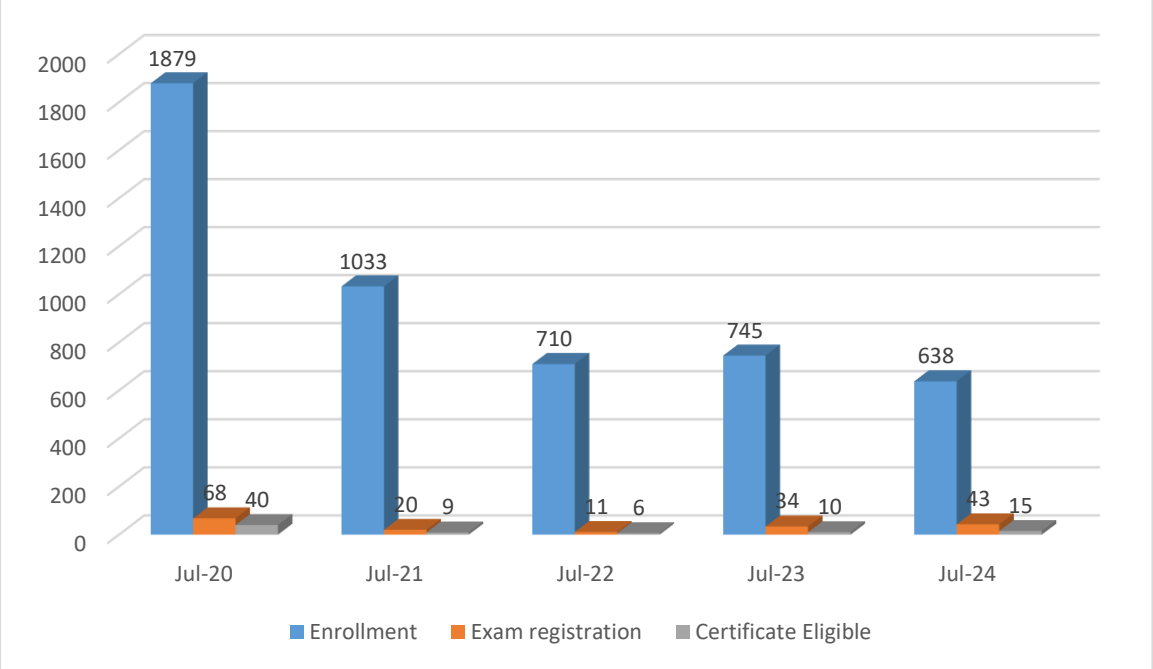
Prof. Arup Nandy
Mechanical Engineering

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

Finite Element Method (FEM) is one of the most popular numerical method to boundary and initial value problems. One distinct feature of FEM is that it can be generalized to the domains of any arbitrary geometry. Theory of FEM is developed on Variational methods. In this course, finite element formulations will be derived from the governing partial differential equation of different physical systems based on Variational methods. It will start with one-dimensional Bar, Beam, Truss, Frame elements; and will be extended to two-dimensional structural, and thermal problems. The framework of standard master element in both 1D and 2D will be followed, so that transformation for any arbitrary geometry is well understood. Two-dimensional formulation will be represented in Tensorial framework, after building necessary background in Tensor calculus. Most importantly for every element, the basic code for computer implementation will be provided and explained with step-by-step clarification. We will also elaborately present how to prepare a generalized FEM code with first hand implementation.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	1879	68	40
Jul-Oct 2021	Rerun	1033	20	9
Jul-Dec 2022	Rerun	710	11	6
Jul-Oct 2023	Rerun	745	34	10
Jul-Oct 2024	Repeat	638	43	15



Fundamentals of Compressible Flow

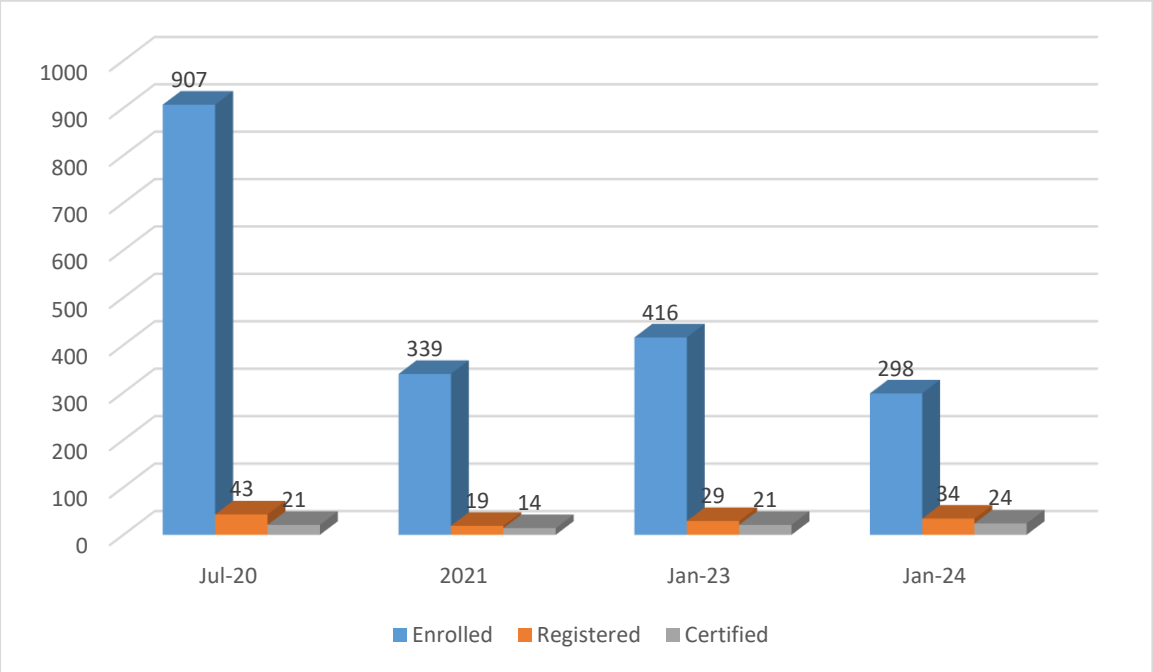
Prof. Niranjan Sahoo
Mechanical Engineering

Type of the course: New, July 2020 run Duration: 8 weeks

Course Outline:

Gas Dynamics is a subject of fundamental interest to Mechanical and Aerospace engineers that provides a link between fundamental subjects i.e. "Fluid Mechanics and Thermodynamics". It pertains the basic theory of compressible flow, formation of shock waves and expansion waves, nozzle flows.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	907	43	21
Jul-Oct 2021	Rerun	339	19	14
Jan-Apr 2023	Rerun	416	29	21
Jan-Apr 2024	Repeat	298	34	24



Fundamentals of Convective Heat Transfer

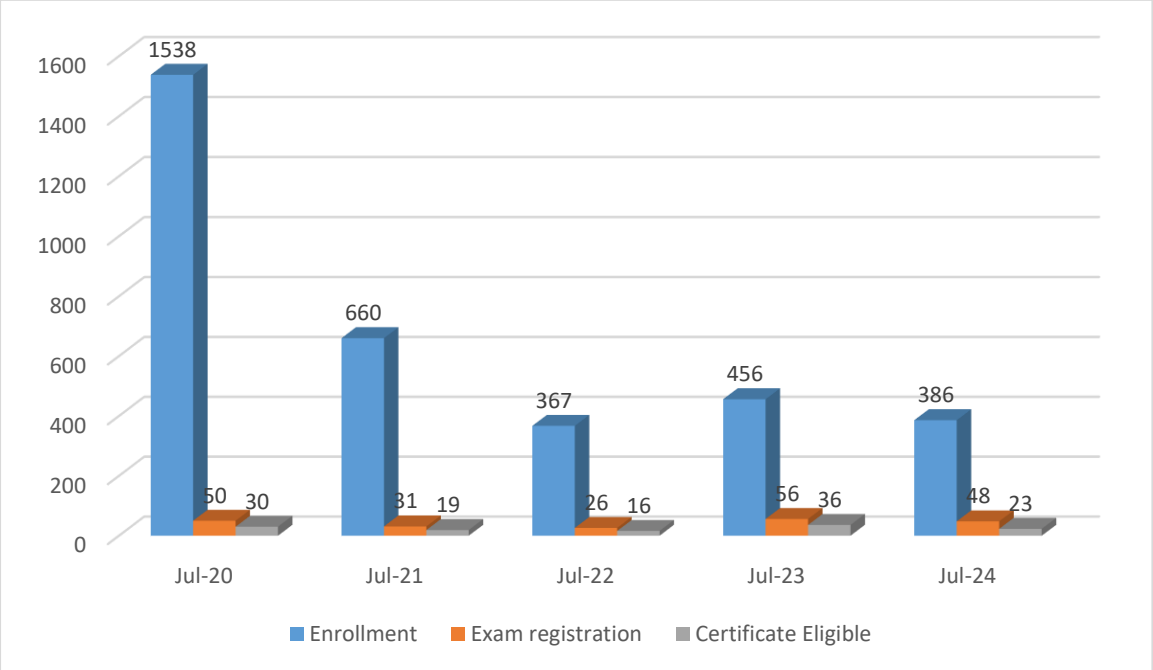
Prof. Amaresh Dalal
Mechanical Engineering

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

Convective heat transfer is one of the most important areas of engineering sciences. It is major mode of heat transfer during flowing fluid and it is the most common mode of heat transfer used in industry. This course will cover the preliminary concepts, forced convection and natural convection for external flows and internal flows, turbulent flows and phase change heat transfer. Numerical solution of the governing equations will also be covered. This course is more analytical. The course will help faculty members, students and researchers in the field to get indepth concepts in convective heat transfer.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	1538	50	30
Jul-Oct 2021	Rerun	660	31	19
Jul-Dec 2022	Rerun	367	26	16
Jul-Oct 2023	Rerun	456	56	36
Jul-Oct 2024	Repeat	386	48	23



Introduction to Western Political Thought

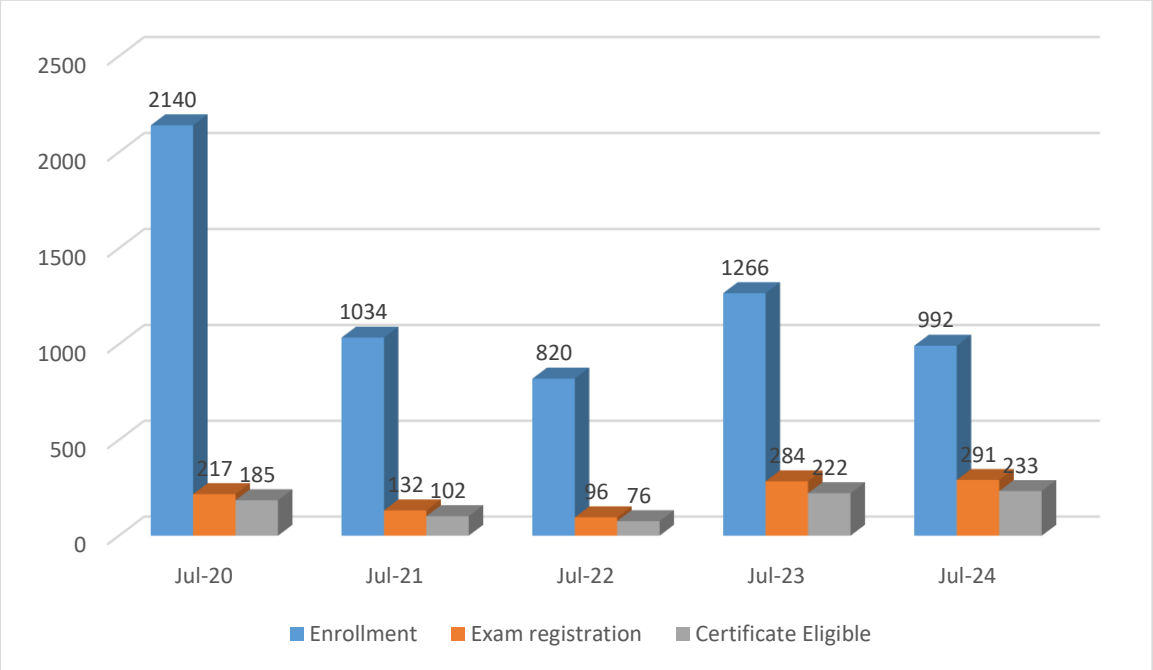
Prof. Mithilesh Kumar Jha
Humanities and Social Sciences

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

One of the major objectives of this course is to introduce the students to the key debates and ideas in Western political thought. It is hoped that familiarity with the ideas or concepts of some major western political thinkers will help the students to understand different perspectives and approaches to state, politics, government, sovereignty, citizenship and so on. It is also hoped that this course will enable the student to make sense of and interpret the major developments and key debates in the political debates and discussions in any contemporary society and polity.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	2140	217	185
Jul-Oct 2021	Rerun	1034	132	102
Jul-Dec 2022	Rerun	820	96	76
Jul-Oct 2023	Rerun	1266	284	222
Jul-Oct 2024	Rerun	992	291	233



Mathematical Portfolio Theory

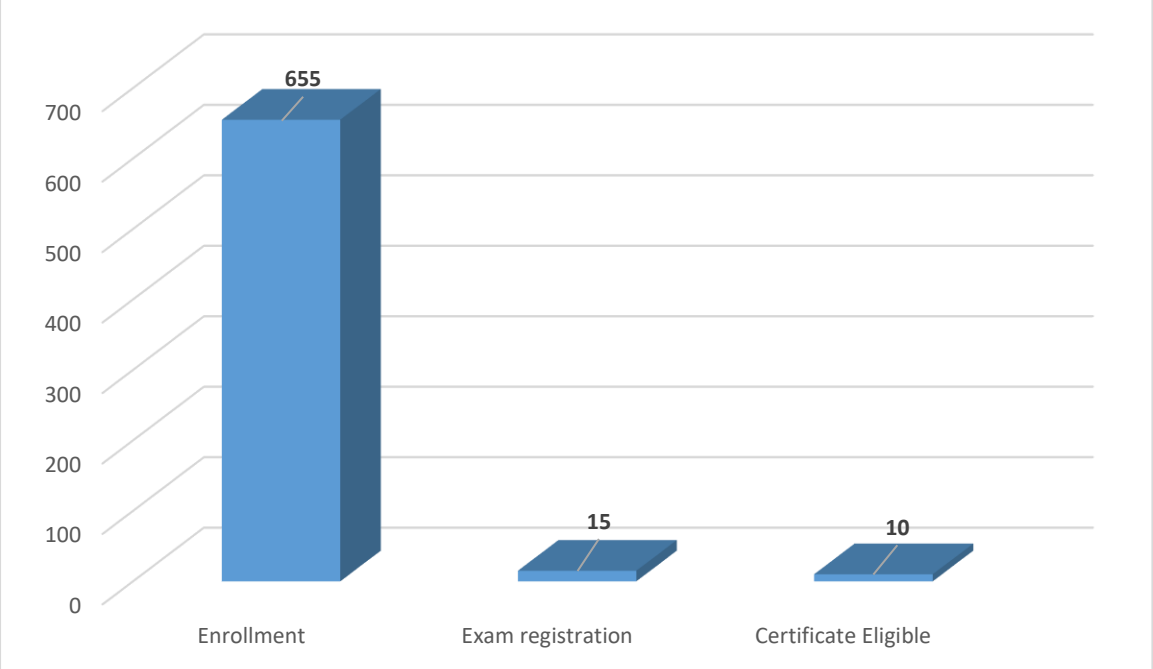
Prof. Siddhartha Pratim Chakrabarty
Mathematics

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

This course will give an introduction to the mathematical approaches used for design and analysis of financial portfolios. It would be useful to participants who want to get a basic insight into mathematical portfolio theory, as well as those who are looking at a career in finance industry, particularly as asset managers.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	655	15	10



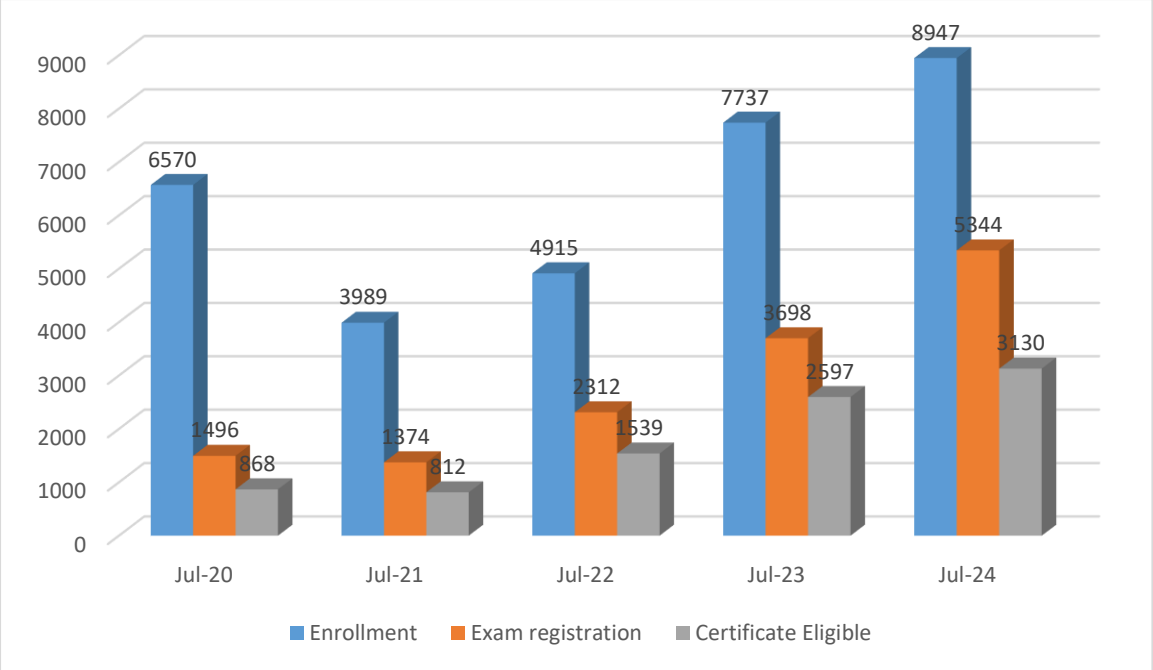
Prof. Ajay Kalamdhad
Civil Engineering

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

The problems affiliated with solid waste management (SWM) in today's sprawling civilized and urbanized society are intricate because of the quantity and varied nature of wastes, the funding restriction for public disposal, interference of technology (energy and raw materials), and complex infrastructure development network in urban cities. As a result, if SWM is to achieve in consummate approach, the fundamentals aspects need to be identified. Thus, there is dire need to group the activities from the generation to the disposal point. The six different functional elements (generation, handing and separations, storage and processing at source, collection, the transformation of wastes, transfer and transport, and final disposal) for the engineering comparison and treatment need to be understood in detail. The understanding of the functional element is important because it helps in evaluating the impacts of projected changes and technological developments. Solid waste management is an essential part of every society, but it is also one of the most neglected one. An in-depth understanding of the subject is required to tackle the current solid waste management crisis effectively. This course attempts to familiarize various steps involved in solid waste management.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	6570	1496	868
Jul-Oct 2021	Rerun	3989	1374	812
Jul-Dec 2022	Rerun	4915	2312	1539
Jul-Oct 2023	Rerun	7737	3698	2597
Jul-Oct 2024	Rerun	8947	5344	3130



River Engineering

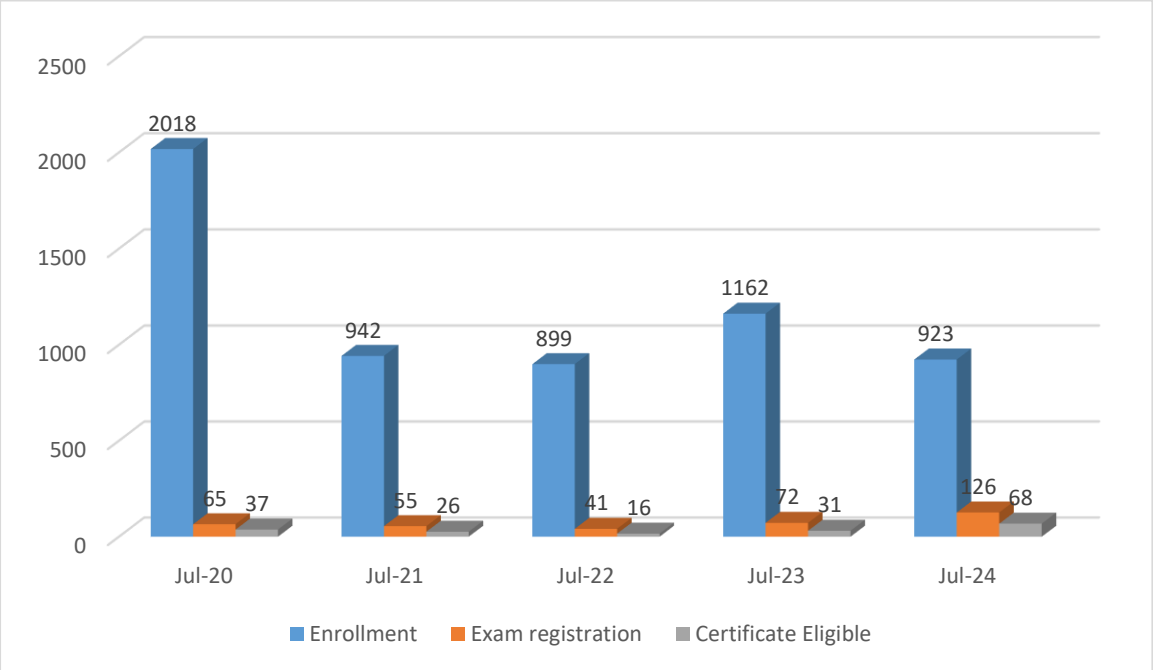
Prof. Subashisa Dutta
Civil Engineering

Type of the course: New, July 2020 run Duration: 8 weeks

Course Outline:

In the last few decades, water demand in the globe has increased in many folds. Rivers, one of the major source of water demand for domestic, agricultural and industrial uses, are often not utilised properly for long term sustainability. Therefore, it is a challenging task for engineers for understanding water, sediment and energy transport processes in rivers in both spatial and temporal scales. This course will address how to understand and model hydro-fluvial processes and designing of advanced river intervention structures.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	2018	65	37
Jul-Oct 2021	Rerun	942	55	26
Jul-Dec 2022	Rerun	899	41	16
Jul-Sep 2023	Repeat	1162	72	31
Jul-Sep 2024	Repeat	923	126	68



Solar Energy Engineering and Technology

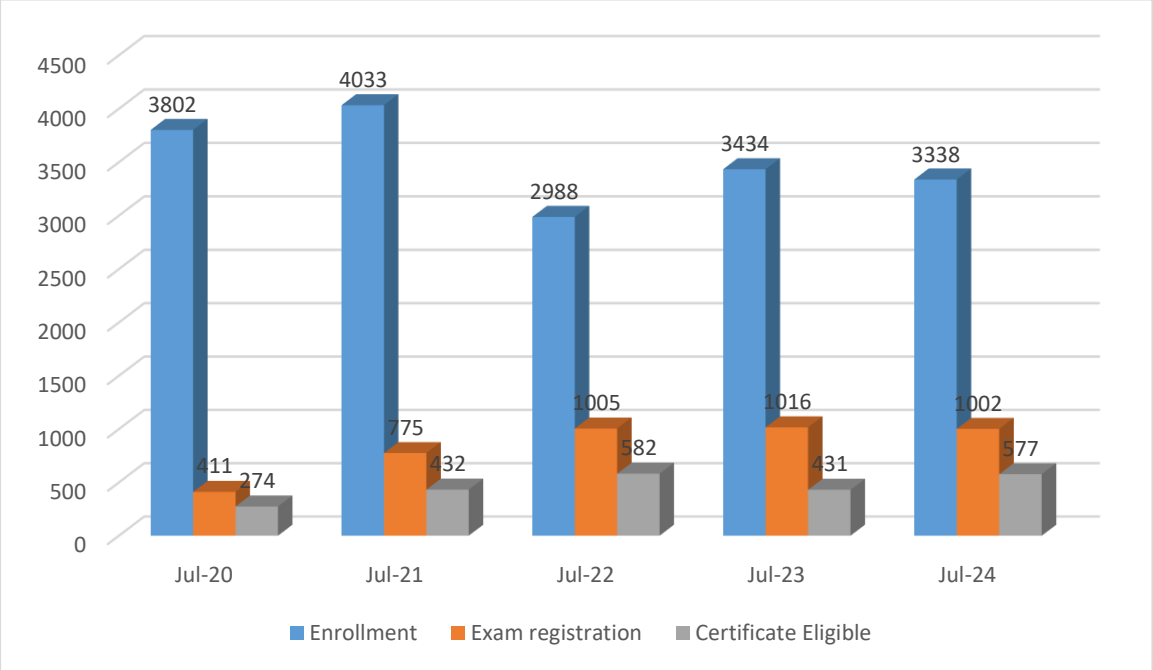
Prof. Pankaj Kalita
Energy

Type of the course: New, July 2020 run Duration: 12 weeks

Course Outline:

The course content is designed to provide comprehensive knowledge on solar radiation, analysis of solar radiation data, fundamentals of the solar thermal and photovoltaic system along with storage of energy required for effective design of efficient solar energy conversion devices. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

Timeline	Type	Enrolled	Registered	Certified
Sep-Dec 2020	New	3802	411	274
Jul-Oct 2021	Rerun	4033	775	432
Jul-Dec 2022	Rerun	2988	1005	582
Jul-Oct 2023	Rerun	3434	1016	431
Jul-Oct 2024	Rerun	3338	1002	577



Advanced Soil Mechanics

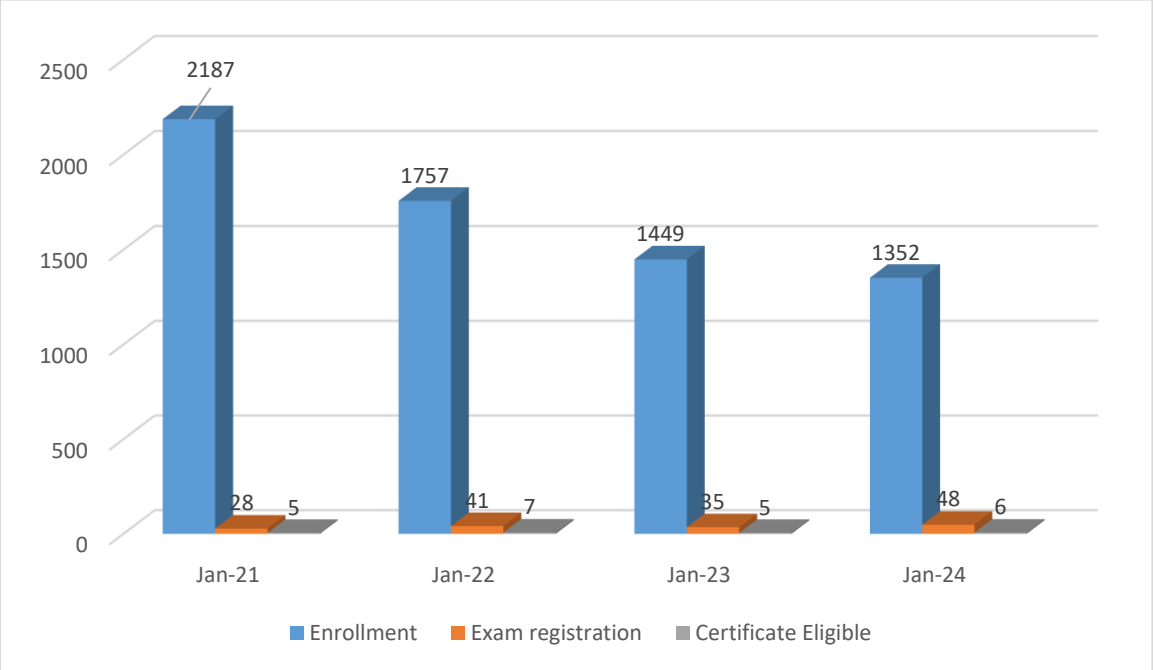
Prof. Sreedeep S.
Civil Engineering

Type of the course: New, Jan 2021 run Duration: 12 weeks

Course Outline:

This course intends to bridge the basic soil mechanics concepts with the advanced topics related to stresses and soil strength. In the process, it will help to reinforce the understanding gained during the undergraduate learning and would help to alleviate any misconceptions related to the stress-strain response and strength behaviour of soils. Not all the concepts explained in this course are advanced, but attempts to add clarity to the knowledge gained at undergraduate level. This course is ideal for the orientation of geotechnical engineering post-graduate students and final year undergraduate students to the higher realms of geomechanical characteristics of soils.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	2187	28	5
Jan-Apr 2022	Rerun	1757	41	7
Jan-Apr 2023	Rerun	1449	35	5
Jan-Apr 2024	Repeat	1352	48	6



Biointerface Engineering

Prof. Lalit M. Pandey
Biotechnology and Bioscience Engineering

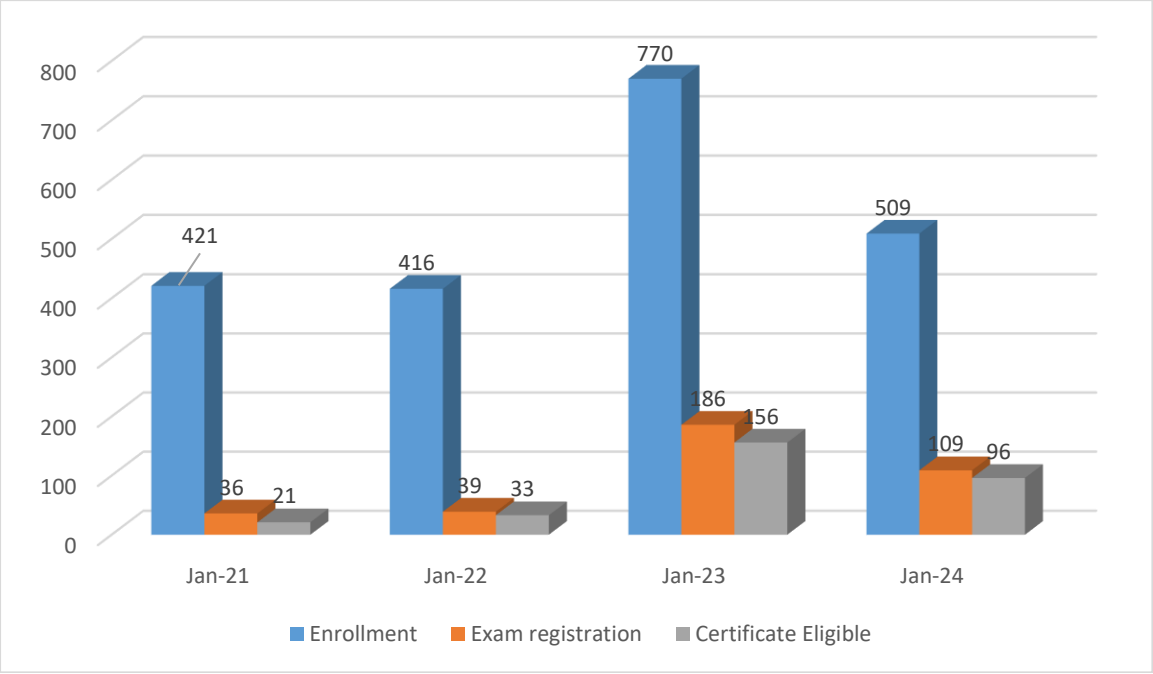
Type of the course: New, Jan 2021 run

Duration: 8 weeks

Course Outline:

The aim of the course is to create a surface chemical way of thinking when considering biomedical approaches, products and applications. The course will focus on surface and surface chemistry and its interactions with biomacromolecules. This course will highlight the role of interfacial phenomena towards behavior of biomolecules on surfaces. The first half of this course will cover basic physical chemistry of surfaces and interfaces, and common experimental methods for surface characterization. The second part of the course will emphasize interactions of biological systems with surfaces and modified surfaces at the molecular and cellular levels.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	421	36	21
Jan-Mar 2022	Rerun	416	39	33
Jan-Apr 2023	Rerun	770	186	156
Jan-Mar 2024	Repeat	509	109	96



Biomass Conversion and Biorefinery

Prof. Kaustubha Mohanty
Chemical Engineering

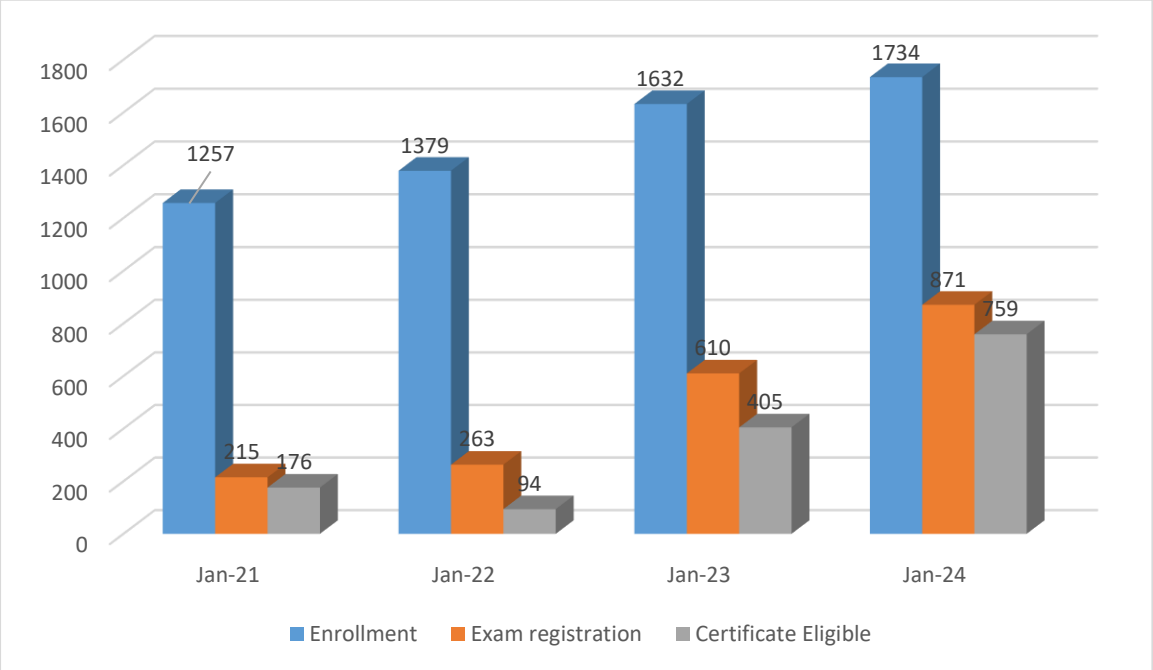
Type of the course: New, Jan 2021 run

Duration: 12 weeks

Course Outline:

Since last two decades, researchers worldwide have drawn their attention to biomass-based fuels as well as other value-added products as biomass is not only renewable but also CO2 neutral. This course will provide an insight to the basics of biomass, various conversion technologies and the different types of products that can be obtained upon successful conversion. In first few lectures types biomass, their structure and composition has been discussed followed by details on various pre-treatment technologies currently adapted to produce cellulose.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	1257	215	176
Jan-Apr 2022	Rerun	1379	263	94
Jan-Apr 2023	Rerun	1632	610	405
Jan-Apr 2024	Rerun	1734	871	759



Computer Vision and Image Processing – Fundamentals and Applications

Prof. M.K. Bhuyan
Electronics and Electrical Engineering

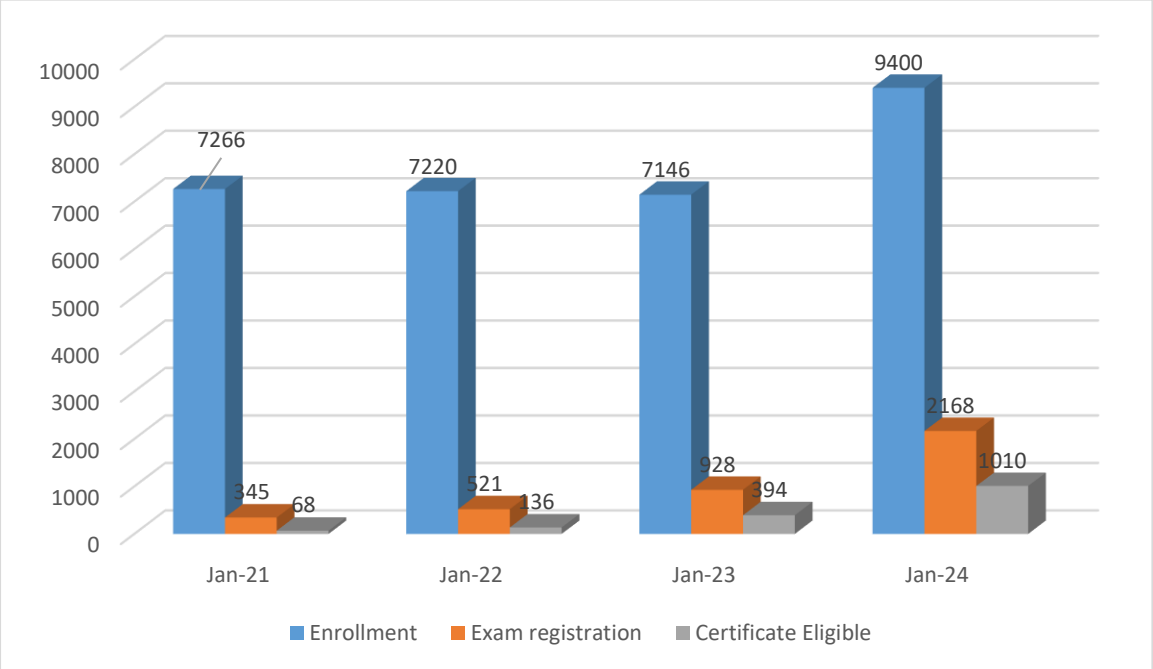
Type of the course: New, Jan 2021 run

Duration: 12 weeks

Course Outline:

The intent of this course is to familiarize the students to explain the fundamental concepts/issues of Computer Vision and Image Processing, and major approaches that address them. This course introduces computer vision including image acquisition and image formation models, radiometric models of image formation, image formation in the camera, image processing concepts, concept of feature extraction and selection for pattern classification/recognition, and advanced concepts like motion estimation and tracking, image classification, scene understanding, object classification and tracking, image fusion, and image registration, etc. This course will cover the fundamentals of Computer Vision. It is suited for mainly students who are interested in doing research in the area of Computer Vision. After completing the course, the students may expect to have the knowledge needed to read and understand more advanced topics and current research literature, and the ability to start working in industry or in academic research in the field of Computer Vision and Image Processing. They can also apply all these concepts for solving the real-world problems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	7266	345	68
Jan-Apr 2022	Rerun	7220	521	136
Jan-Apr 2023	Rerun	7146	928	394
Jan-Apr 2024	Rerun	9400	2168	1010



Construction Methods and Equipment Management

Prof. Indu Siva Ranjani Gandhi
Civil Engineering

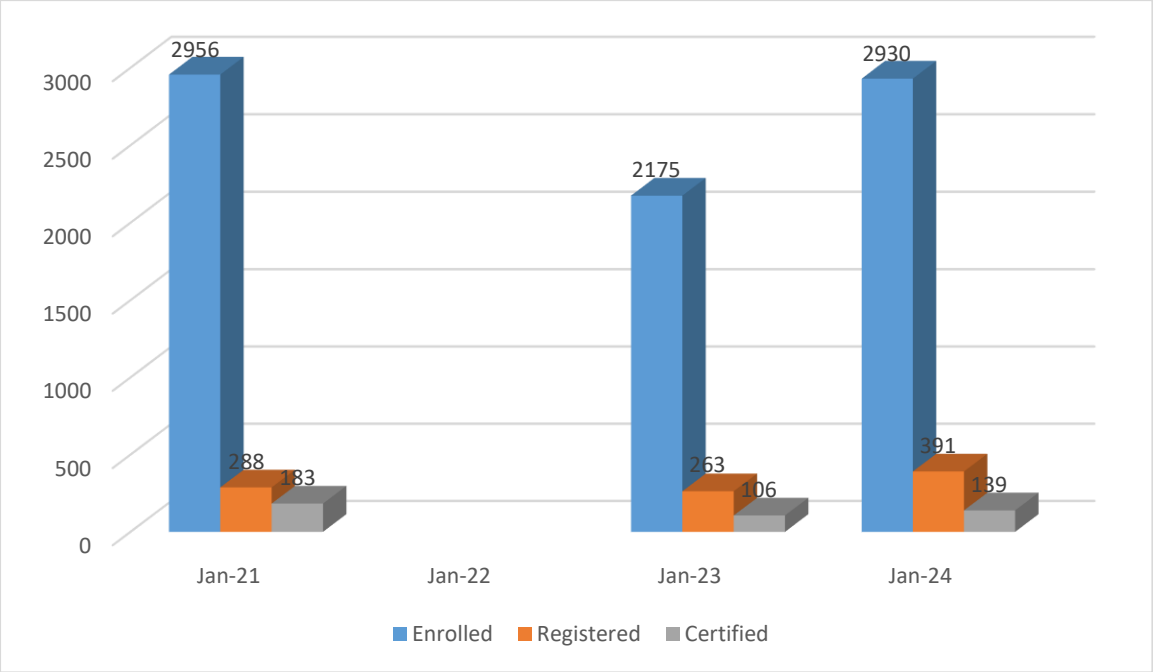
Type of the course: New, Jan 2021 run

Duration: 8 weeks

Course Outline:

The key element of any project successful execution is planning which includes planning of equipment also. Due to recent advancement in mechanization, different models of machines are available in the market for a particular job. The job of the project planner is to choose right machine for the right job. Hence understanding of machine capabilities is very important for optimal selection and utilization of equipment. This course provides comprehensive information on guidelines for selection of equipment, estimation of cost and productivity of various equipment. Further, a deep insight into excavation, pile driving methods, cranes and concreting equipment is provided, the information on which is very much essential for people working in construction industry.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	2956	288	183
Jan-Mar 2023	Rerun	2175	263	106
Jan-Mar 2024	Rerun	2930	391	139



Evolutionary Computation for Single and Multi-Objective Optimization

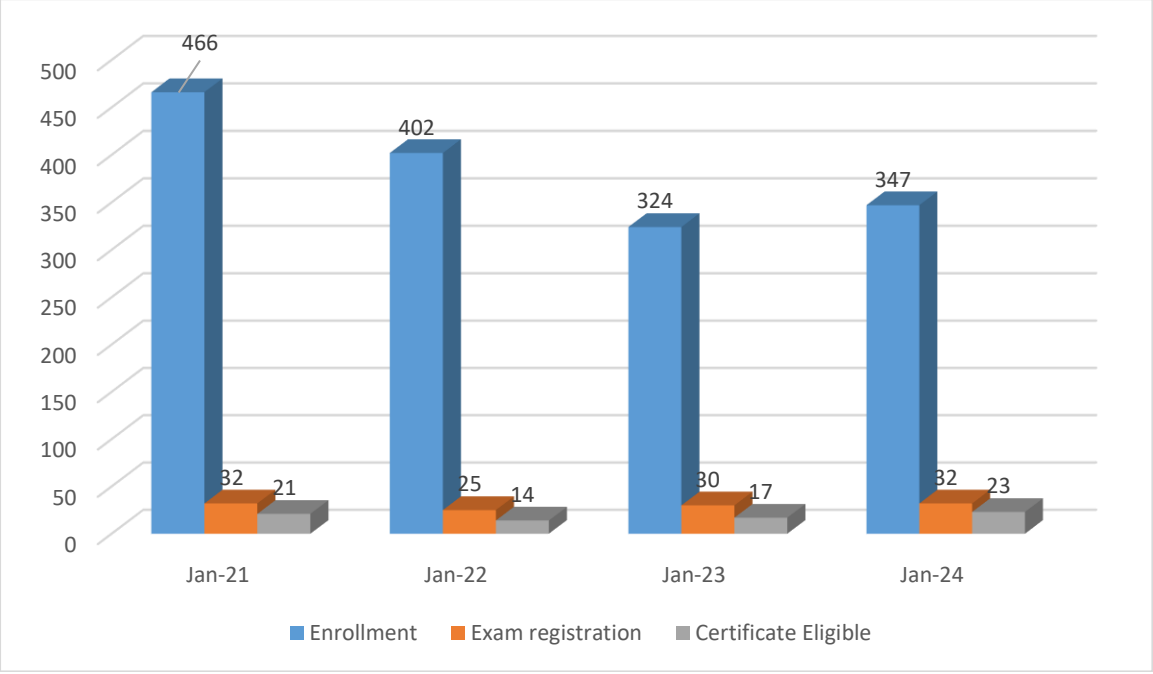
Prof. Deepak Sharma
Mechanical Engineering

Type of the course: New, Jan 2021 run Duration: 8 weeks

Course Outline:

Evolutionary computation (EC) is a sub-field of computational intelligence that use ideas and get inspiration from natural evolution. It is based on Darwin's principle of evolution where the population of individuals iteratively performs search and optimization. EC techniques can be applied to optimization, learning, design and many more. This course will concentrate on the concepts, algorithms, hand-calculations, graphical examples, and applications of EC techniques. Topics will be covered include binary and real-coded genetic algorithms, differential evolution, particle swarm optimization, multi-objective optimization and evolutionary algorithms, and statistical assessment. Students will be taught how these approaches identify and exploit biological processes in nature, allowing a wide range of applications to be solved in industry and business. Students will have the opportunity to build and experiment with several different types of EC techniques through-out the course.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	466	32	21
Jan-Mar 2022	Rerun	402	25	14
Jan-Mar 2023	Rerun	324	30	17
Jan-Mar 2024	Repeat	347	32	23



Finite element modeling of welding processes

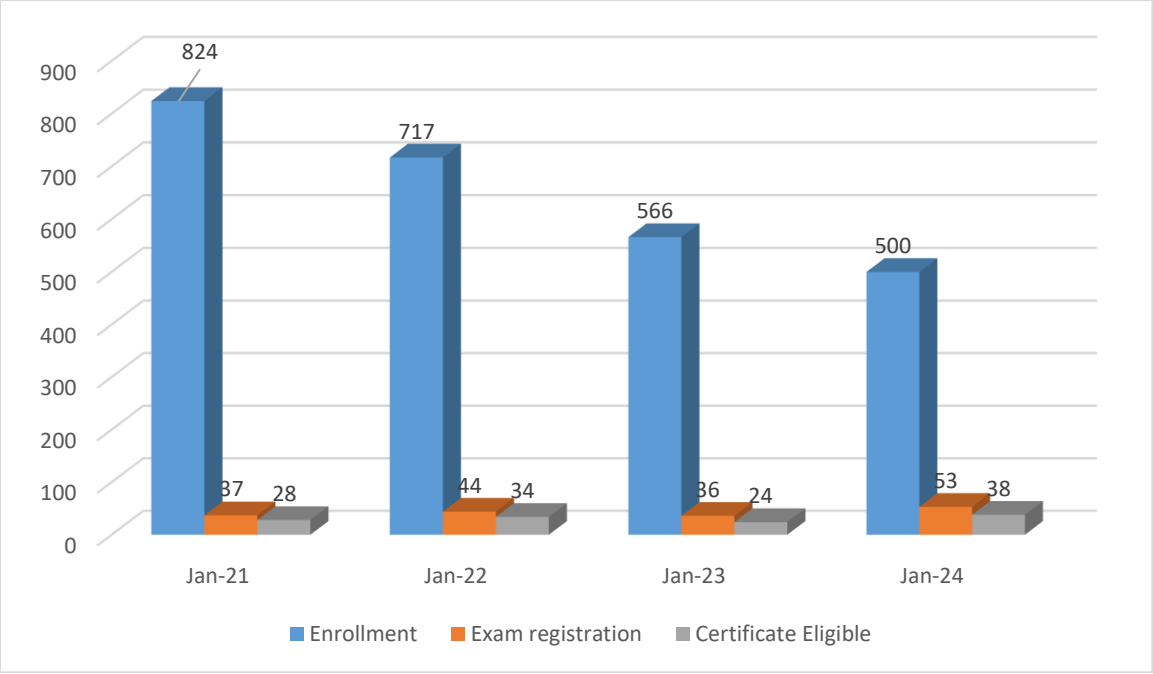
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, Jan 2021 run Duration: 12 weeks

Course Outline:

The welding process involves complex interaction of several mechanisms. The fundamental understanding relied on basic mechanisms such as heat transfer and/or fluid flow, and associated distortion and residual stress generation including the effect of metallurgical transformation for a welding process is the focus of this course. It helps to develop the numerical model, and makes the foundation for analysis and experimentation for the process. The development of computational models for welding process relies on mathematical expression of the governing mechanism. It helps to design relevant experiments and drives to find the data to be obtained.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	824	37	28
Jan-Apr 2022	Rerun	717	44	34
Jan-Apr 2023	Rerun	566	36	24
Jan-Apr 2024	Repeat	500	53	38



Fundamental of Fluid Mechanics for Chemical and Biomedical Engineers

Prof. Raghvendra Gupta
Chemical Engineering

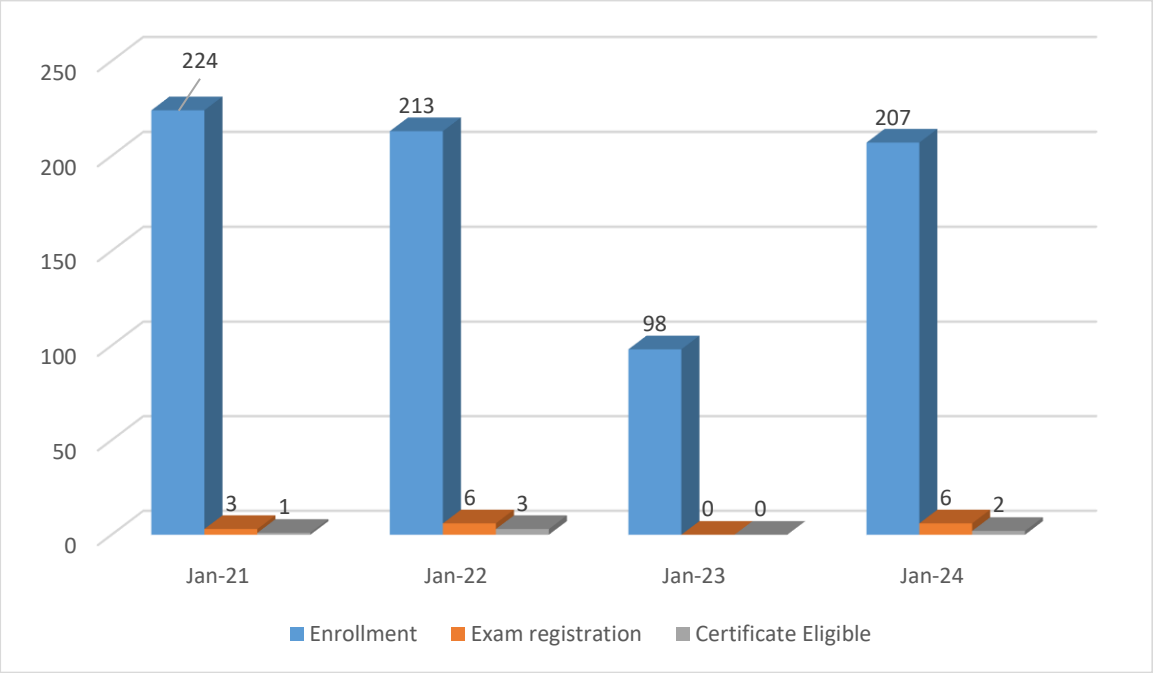
Type of the course: New, Jan 2021 run

Duration: 12 weeks

Course Outline:

This basic course on fluid dynamics is designed specifically for Chemical Engineering. The participants will be introduced to properties of fluid and flow properties such as velocity, stress. The students will learn to analyse the fluid flow problem employing dimensional analysis, integral analysis and differential analysis. The course would focus more on viscous flow in pipes and around submerged objects such as spheres and cylinders. A number of problems relevant to chemical and biomedical engineering applications will be solved.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	224	3	1
Jan-Apr 2022	Rerun	213	6	3
Jan-Apr 2023	Rerun	98	0	0
Jan-Apr 2024	Repeat	207	6	2



Nonlinear Vibration

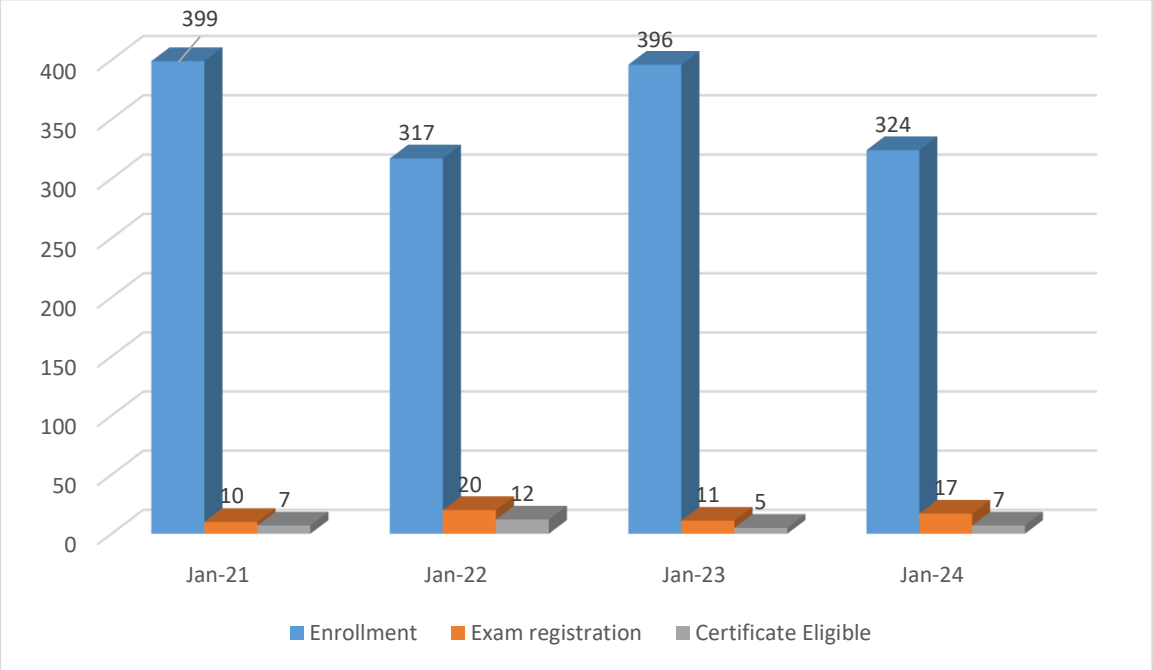
Prof. S. K. Dwivedy
Mechanical Engineering

Type of the course: New, Jan 2021 run Duration: 12 weeks

Course Outline:

Most of the vibrating structure are nonlinear in nature. But for simplification of the analysis they have been considered to be linear. Hence, to actually know the response of the system one should study the nonlinear behavior of the system. Here one may encounter multiple equilibrium points or solutions which may be stable or unstable. The response may be periodic, quasiperiodic or chaotic. The present course is a simulation-based course where one can visualize the response of different mechanical 4 systems for different resonance conditions. Out of 9 modules, first 8 modules are on developing the equations of motion, solution procedure of these equations and application of them to general single and multi-degree of freedom systems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	399	10	7
Jan-Apr 2022	Rerun	317	20	12
Jan-Apr 2023	Rerun	396	11	5
Jan-Apr 2024	Repeat	324	17	7



Philosophical Foundations of Social Research

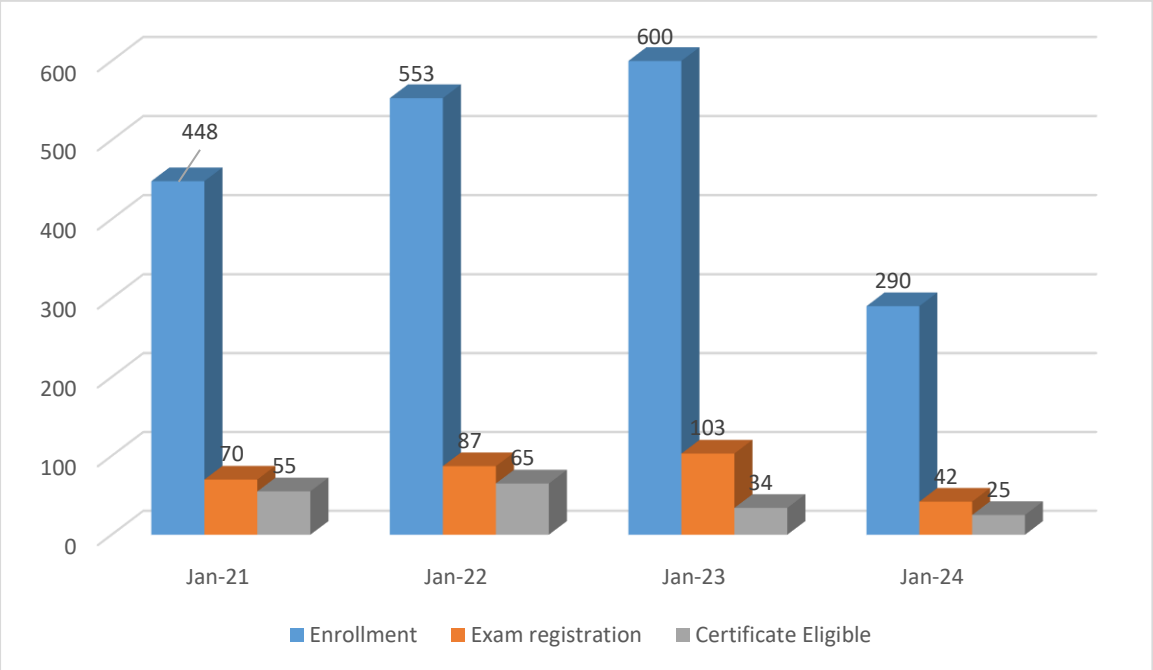
Prof. Sambit Mallick
Humanities and Social Sciences

Type of the course: New, Jan 2021 run Duration: 8 weeks

Course Outline:

This course is concerned with the nature of social science inquiry. It is intended for students in all disciplines and those early in their masters and doctoral research programmes. The course travels through philosophy of science, epistemology, ontology and specific applications to the major disciplinary areas. The main objectives of the course are to: (a) introduce the philosophy of science and its application to social sciences, (b) outline major differing classes of theory in social sciences and to explicate their metatheoretical foundations, (c) familiarize students with the plurality of views on these issues in the intellectual community, (d) provide students with an opportunity to apply these concepts to the analysis of issues in social sciences, and (e) provide students with an opportunity to practise scholarly discourses.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	448	70	55
Jan-Mar 2022	Rerun	553	87	65
Jan-Mar 2023	Rerun	600	103	34
Jan-Mar 2024	Repeat	290	42	25



Phonetics and Phonology: A Broad Overview

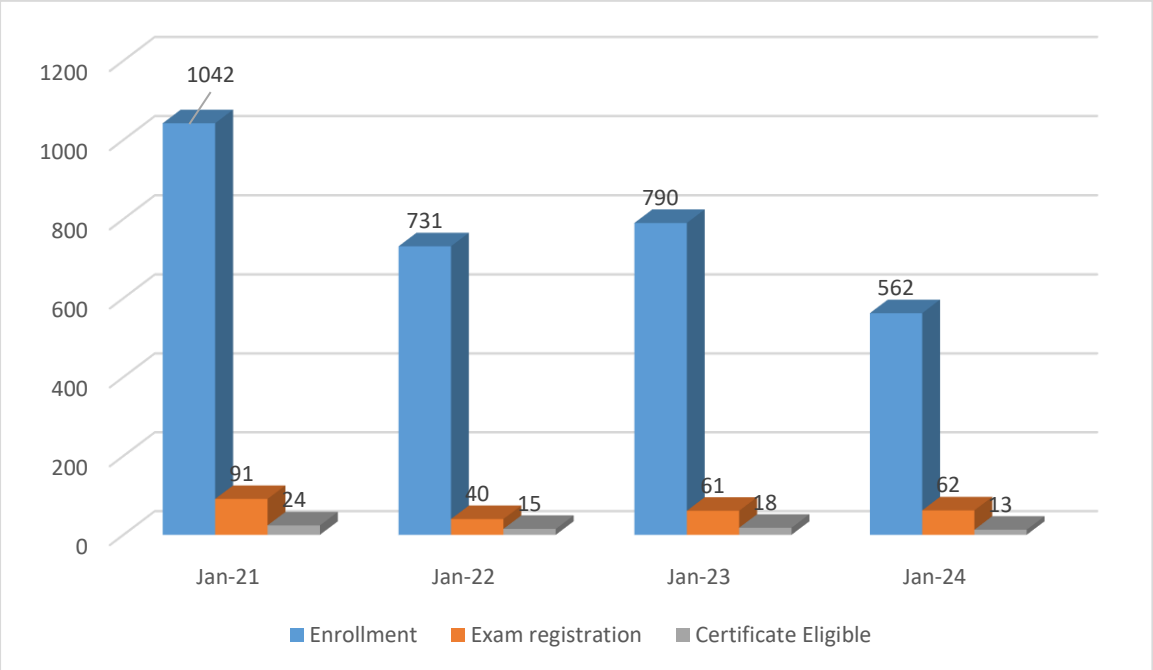
Prof. Shakuntala Mahanta
Humanities and Social Sciences

Type of the course: New, Jan 2021 run Duration: 8 weeks

Course Outline:

This course will provide the foundation for the development of a student's knowledge on phonetics and phonology. A proper introduction of the theoretical underpinnings and conceptual framework of the scientific study of sound systems and its analysis will be the main focus of this course. It will provide a detailed overview of phonetic properties, articulatory and acoustic descriptions and International Phonetic Alphabet (IPA) transcription of the sounds in the languages of the world. It also deals with phonological theory and covers many aspects of phonemics, phonological representations, features phonological alternations. Finally, the students will learn about many of these concepts with the help of data analysis and problem-solving. We will include examples from Indian languages to make the material more relevant to the students.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	1042	91	24
Jan-Mar 2022	Rerun	731	40	15
Jan-Mar 2023	Rerun	790	61	18
Jan-Mar 2024	Repeat	562	62	13



Psychology of Stress, Health and Well-Being

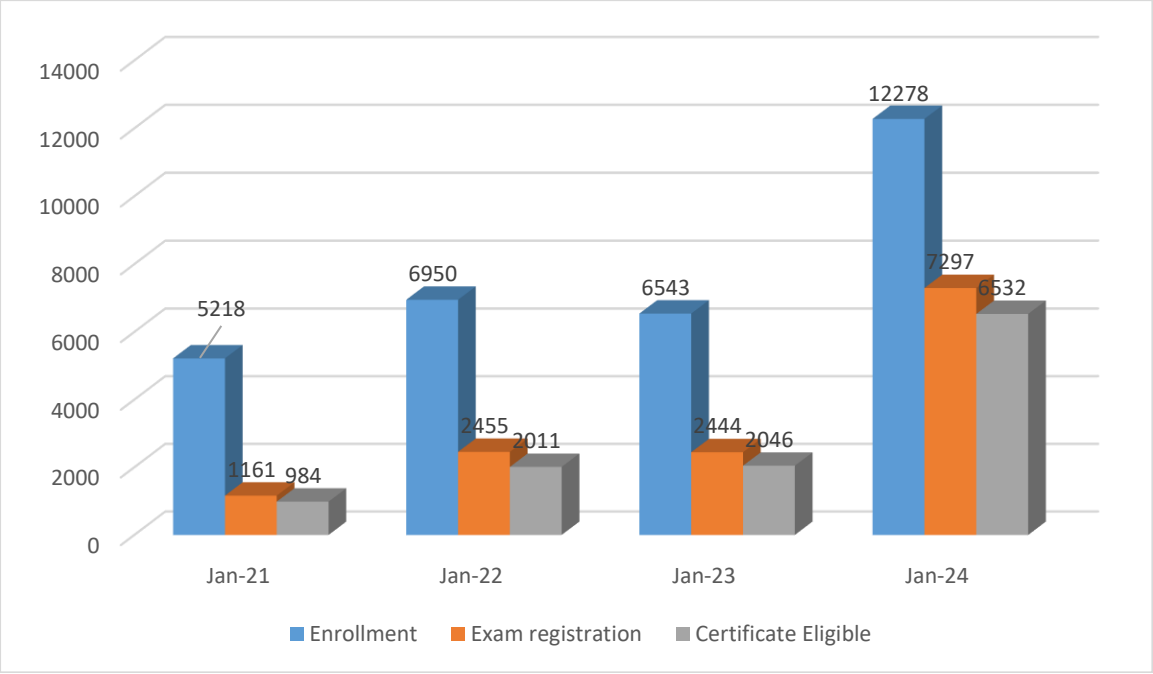
Prof. Dilwar Hussain
Humanities and Social Sciences

Type of the course: New, Jan 2021 run Duration: 12 weeks

Course Outline:

In today's world, mental distress and disorders are common and accounting for a significant burden of disability within nations. However, at the same time, there has been a growing interest in understanding and enhancing positive mental health and wellbeing particularly in the field of psychology. Overall, this course systematically addresses the issues of health, adjustment and well-being. It reviews the topics of stress and health while adding happiness and well-being theory and research to enrich our understanding of both negative and positive side of human behavior. Overall, this course will attempt to provide insights from the field of psychology to make your life more satisfying and meaningful.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	5218	1161	984
Jan-Apr 2022	Rerun	6950	2455	2011
Jan-Apr 2023	Rerun	6543	2444	2046
Jan-Apr 2024	Rerun	12278	7297	6532




Renewable Energy Engineering: Solar, Wind and Biomass Energy Systems

Prof. Vaibhav Vasant Goud
Chemical Engineering

Prof. R. Anandalakshmi
Chemical Engineering

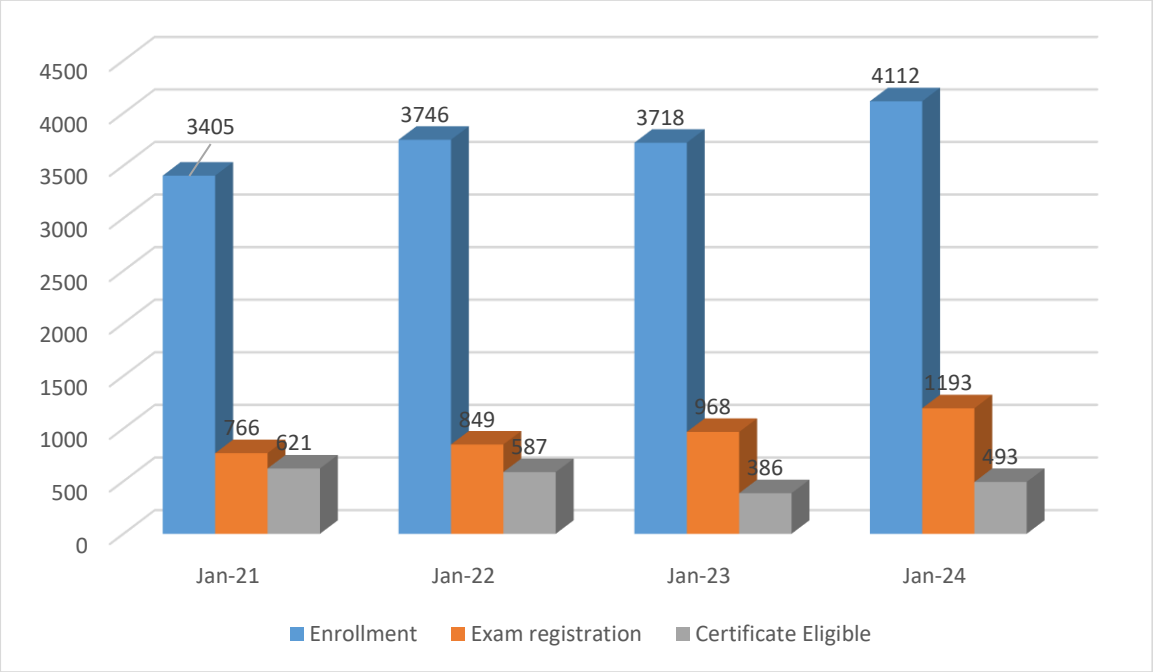
Type of the course: New, Jan 2021 run

Duration: 8 weeks

Course Outline:

In this course an attempt has been made to standardize the course material and to emphasize on the fundamental of non-conventional energy sources (solar, wind, and biomass). Harnessing the energy through these sources using efficient technologies is expected to play an important role in serving as clean energy source for mankind.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	3405	766	621
Jan-Apr 2022	Rerun	3746	849	587
Jan-Apr 2023	Rerun	3718	968	386
Jan-Apr 2024	Rerun	4112	1193	493



Theory of Composite Shells

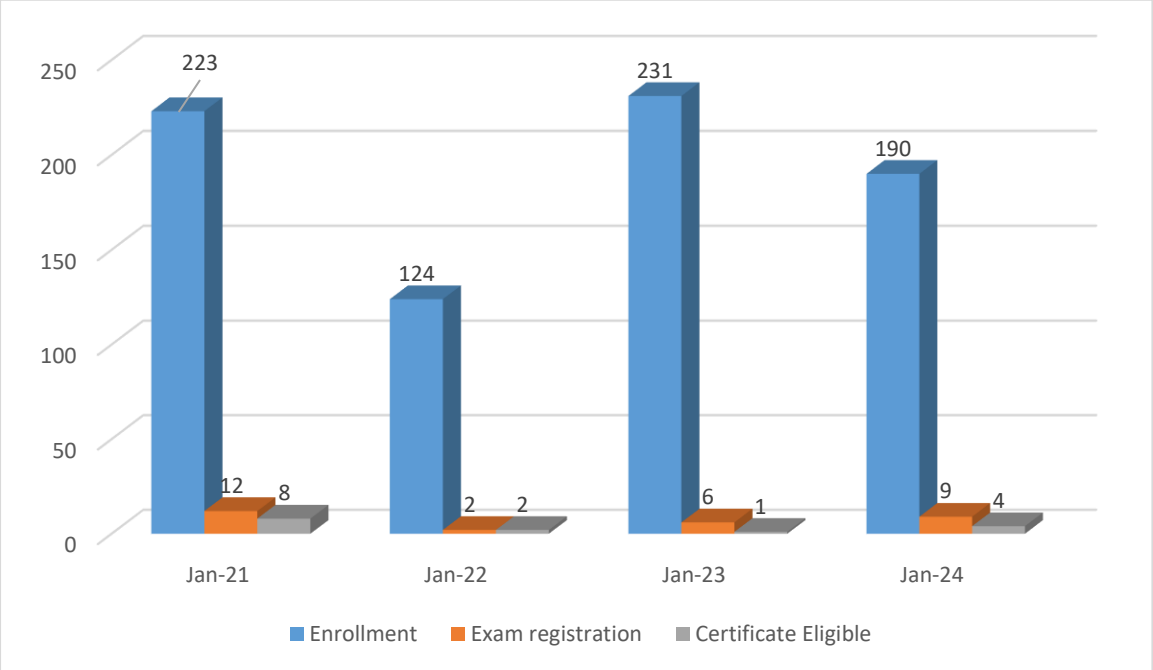
Prof. Poonam Kumari
Mechanical Engineering

Type of the course: New, Jan 2021 run Duration: 8 weeks

Course Outline:

Like beams and plates, shells are the functional element of structural engineering. At research level, a large group of researches work in the field of bending, free vibration, buckling and post buckling analysis of shells made of composites, sandwiches and advance material. In this course, basic concept of doubly curved surfaces will be developed and governing equation will be developed. This will help the participants to develop the shell equations as per their requirement. Bending, free vibration and buckling of shell will be explained. Atutorial using ABAQUS will also be conducted.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2021	New	223	12	8
Jan-Mar 2022	Rerun	124	2	2
Jan-Mar 2023	Rerun	231	6	1
Jan-Mar 2024	Repeat	190	9	4



Viscous Fluid Flow

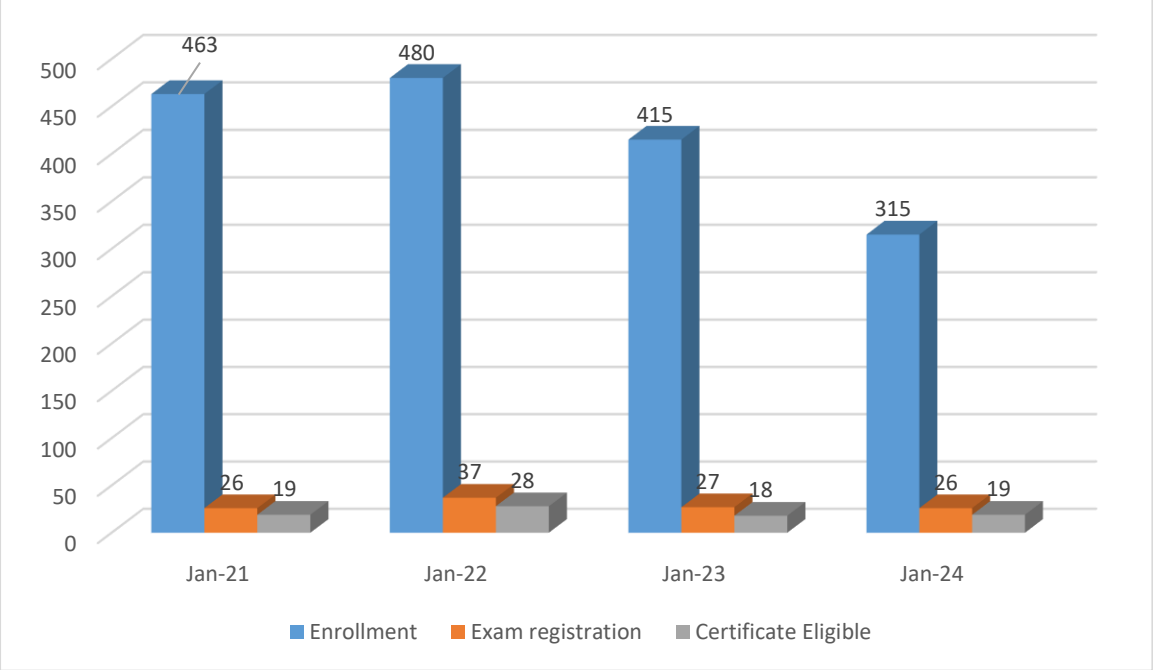
Prof. Amaresh Dalal
Mechanical Engineering

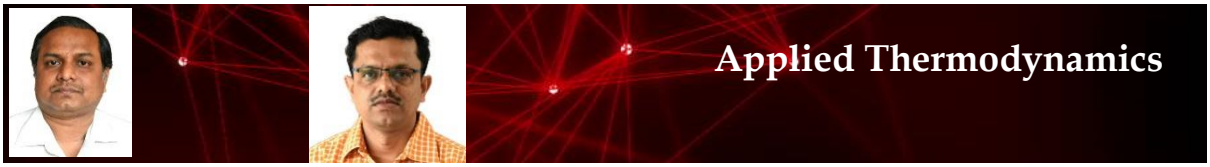
Type of the course: New, Jan 2021 run Duration: 12 weeks

Course Outline:

Viscous fluid flow covers the fundamentals of fluid mechanics from an advanced point of view with emphasis on the mathematical treatment of viscosity effects in Newtonian fluid flows. This course will cover the derivation of Navier-Stokes equations, exact solutions for simplified configurations, creeping flows, Stokess first and second problems, laminar boundary layers, wall-bounded and free-shear boundaries and hydrodynamic stability with an introduction to turbulence.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2021	New	463	26	19
Jan-Apr 2022	Rerun	480	37	28
Jan-Apr 2023	Rerun	415	27	18
Jan-Mar 2024	Repeat	315	26	19





Prof. Niranjan Sahoo
Mechanical Engineering

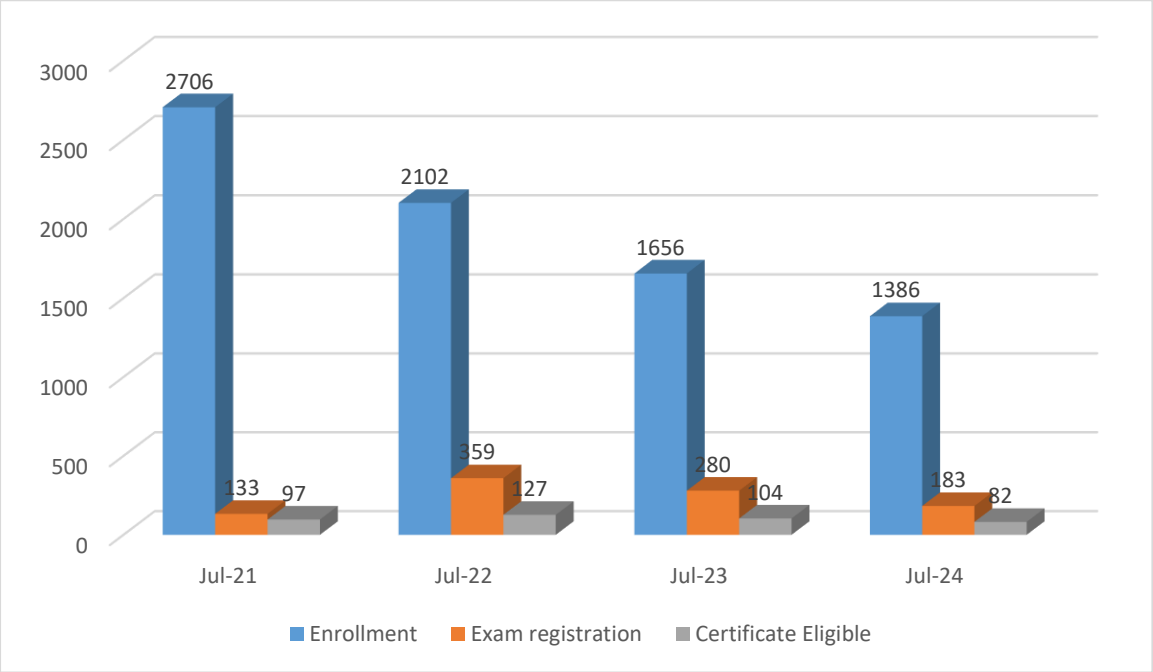
Prof. Pranab K. Mondal
Mechanical Engineering

Type of the course: New Run, July 2021 run
Duration: 12 weeks

Course Outline:

Applied Thermodynamics is a topic of fundamental interest to Mechanical Engineering and Energy Engineering disciplines. This course provides theoretical and thermodynamic background for steam and gas power cycle, refrigeration cycle, psychometric principles, internal combustion engine and gas turbine engine cycles, aircraft and rocket propulsion cycles. Prior to these topics, few lectures are devoted towards basic engineering thermodynamic fundamentals. The syllabus is framed with respect to guidelines of â€œMechanical/Energy Engineeringâ€ UG course curriculum for respective engineering disciplines across the country. The methodical online teaching, problem solving approach and online evaluation will help the candidate for credit transfer for their course curriculum.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	2706	133	97
Jul-Dec 2022	Rerun	2102	359	127
Jul-Oct 2023	Rerun	1656	280	104
Jul-Oct 2024	Rerun	1386	183	82



Aspen Plus® simulation software - a basic course for beginners

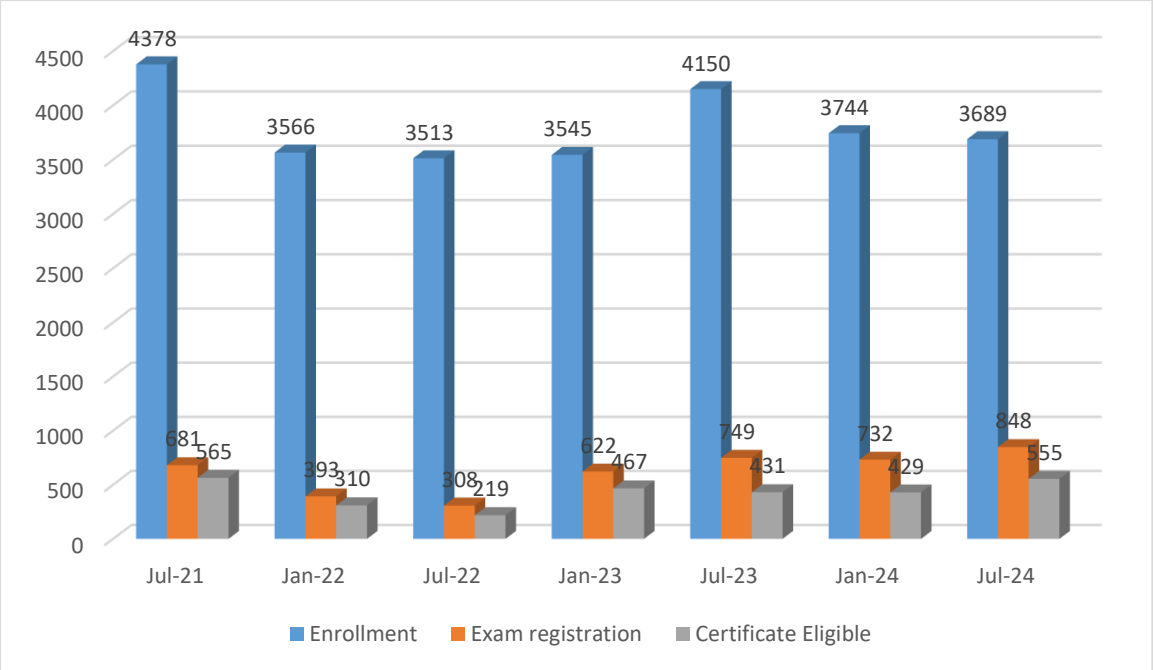
Prof. Prabirkumar Saha
Chemical Engineering

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

Aspen Plus is a process modelling tool used for process monitoring, optimization and conceptual design, especially by chemical process industries. This is a simple course on Aspen Plus Simulation engine that will teach one how to model the most common unit operations of a chemical plant. Basic unit operations such as Pump, Reactor, Valve, Heater, Distillation Column etc. will be demonstrated which would be helpful for students, teachers, engineers and researchers in the area of R&D and Plant Design/ Operation. The course is didactic, with a lot of applied theory and case studies. At the end of the course one will be able to setup a simulation, run it, get design parameters, optimize and get results. This is highly recommended for those who are willing to take a career in simulation/modelling via software.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	4378	681	565
Jan-Apr 2022	Rerun	3566	393	310
Jul-Dec 2022	Rerun	3513	308	219
Jan-Apr 2023	Rerun	3545	622	467
Jul-Oct 2023	Rerun	4150	749	431
Jan-Apr 2024	Rerun	3744	732	429
Jul-Oct 2024	Rerun	3689	848	555



C-Based VLSI Design

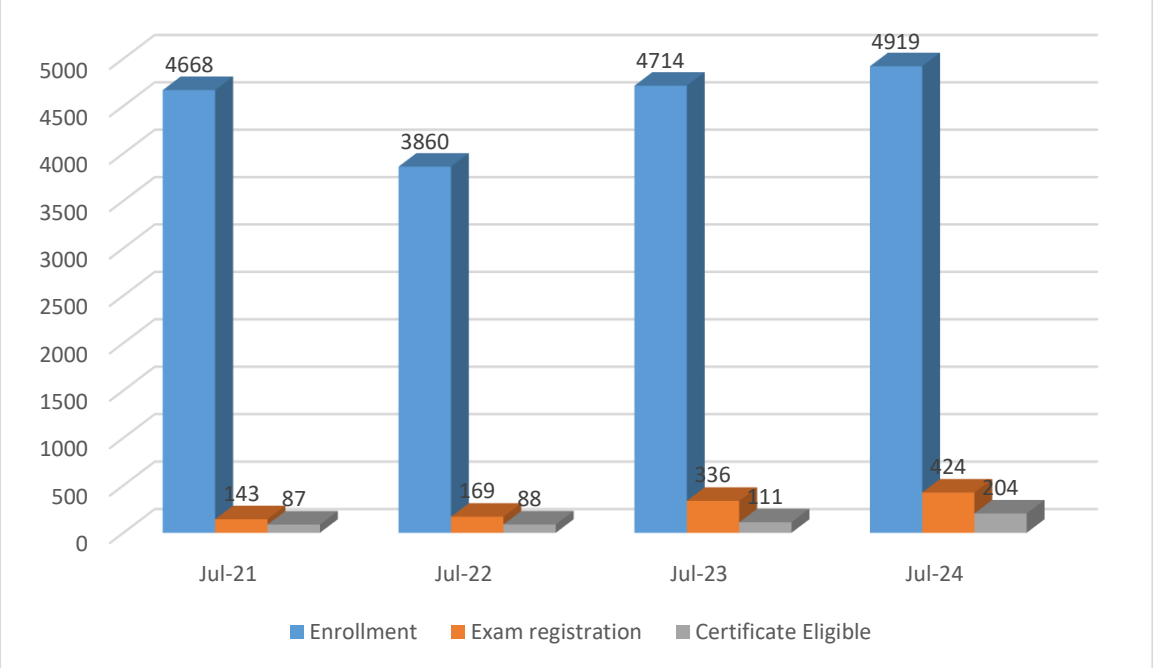
Prof. Chandan Karfa
Computer Science and Engineering

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

This course discussed how a C code can be automatically translated into register transfer level (RTL) design using high-level synthesis (HLS). HLS is an active domain of research in recent times in the domain of electronic Design Automation (EDA) of VLSI. This course will help the student to (i) understand the overall HLS flow, (ii) how a C-code will be converted to its equivalent hardware, (iii) how to write c-code for efficient hardware generation and (iv) how the common software compiler optimization can help to improve the circuit performance. Also, advanced topics like HLS for FPGA targets, HLS for Security, optimizations at RTL level and verification challenges of HLS will be covered. This course will help the student to take up research in the domain of HLS. Also, this course will help the student to become proficient for EDA industries.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	4668	143	87
Jul-Dec 2022	Rerun	3860	169	88
Jul-Oct 2023	Rerun	4714	336	111
Jul-Oct 2024	Rerun	4919	424	204



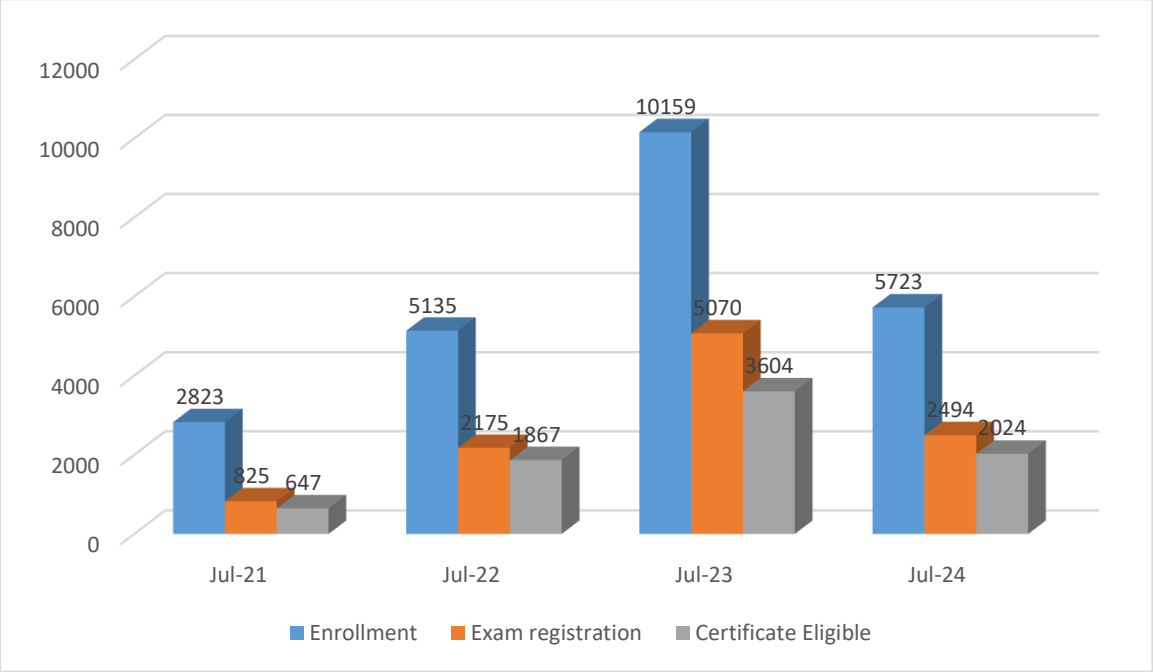
Prof. Ngamjahao Kipgen
Humanities and Social Sciences

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

The course will consist of theoretical application and environmental knowledge pertaining to sustainable development. The course analyses the reciprocal interaction between the physical environment, the social organization and human behaviour in the context of development. The course will introduce students with an overview of environmental ethics, debates and change and to facilitate their understanding and analysis of the inter-relationship between environment and development issues and apply them to their own experience and work. To enhance the students' knowledge of the nature of and underlying causes of the most pressing environmental concerns and to understand how these impact on the lives and livelihoods of the local community. To look at the possibilities for environmental regeneration providing an analysis of case studies of local sustainable development initiatives and community based natural resource management. After the successful completion of the course the students will be able to comprehend the complexity and various forms and dimensions of development and environment issues and ground them in current issues and real-life experiences.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	2823	825	647
Jul-Dec 2022	Rerun	5135	2175	1867
Jul-Oct 2023	Rerun	10159	5070	3604
Jul-Oct 2024	Rerun	5723	2494	2024



Fundamentals of Additive Manufacturing Technologies

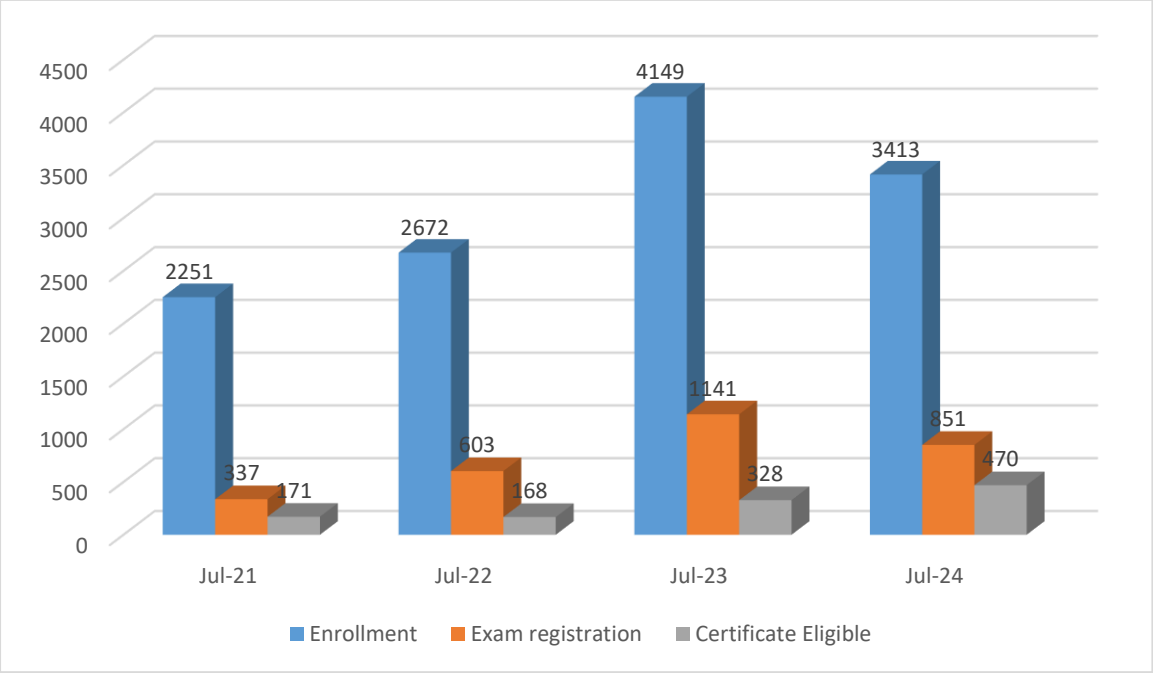
Prof. Sajan Kapil
Mechanical Engineering

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

The progress of additive manufacturing processes is ever increasing with the development of the digital platform in the manufacturing sector, which is essential for the growth of modern technologies. This course is primarily designed for fundamental understanding of different additive manufacturing technologies for realizing the metallic and non-metallic objects. The syllabus is oriented to cover from basic understanding to practical applications of this technology to develop the products.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	2251	337	171
Jul-Dec 2022	Rerun	2672	603	168
Jul-Oct 2023	Rerun	4149	1141	328
Jul-Oct 2024	Rerun	3413	851	470



Introduction to Market Structures

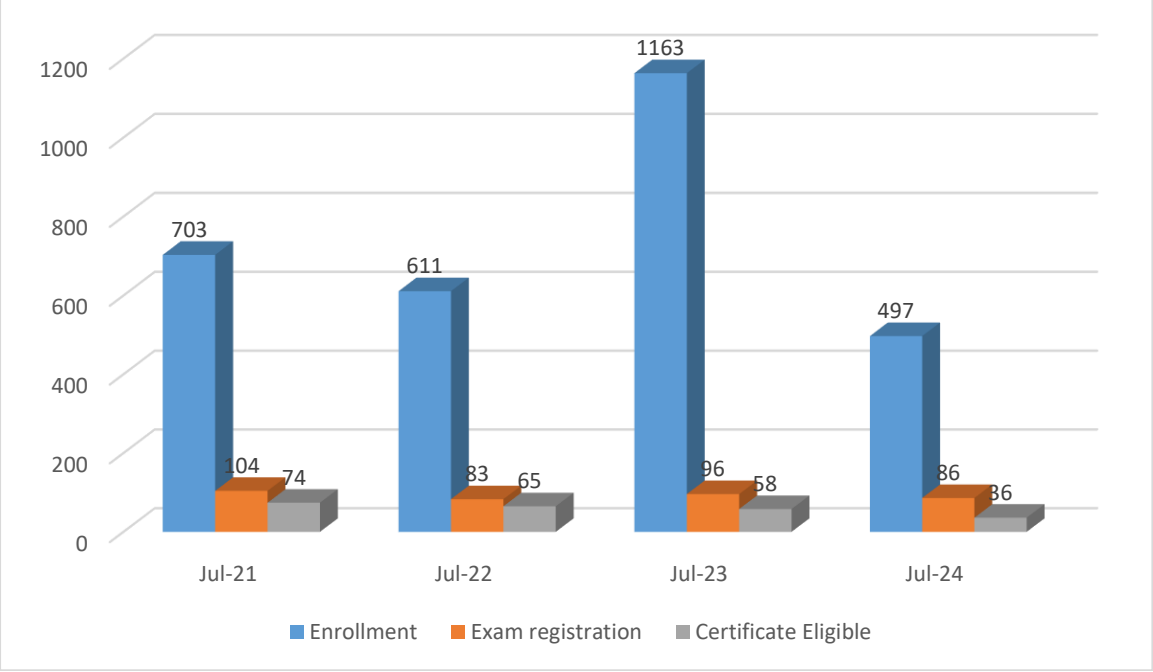
Prof. Amarjyoti Mahanta
Humanities and Social Sciences

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

This course deals with the study of market structures in economics. The study of market structures helps us to understand the pricing of goods and services in the market. Based on toy models, we will study how the price of a good changes with the changes in the market structure. This course can be considered as economic application of game theory. The main tool used to address the questions is game theory. A small component of the course will also be devoted to game theory. The different strategies used by the firms to out compete the rivals, avoid competitions, etc will be introduced in the course. This course can be considered as economic application of game theory. The main tool used to address the questions is game theory. A small component of the course will also be devoted to game theory. The different strategies used by the firms to out compete the rivals, avoid competitions, etc will be introduced in the course.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	703	104	74
Jul-Dec 2022	Rerun	611	83	65
Jul-Oct 2023	Rerun	1163	96	58
Jul-Oct 2024	Repeat	497	86	36



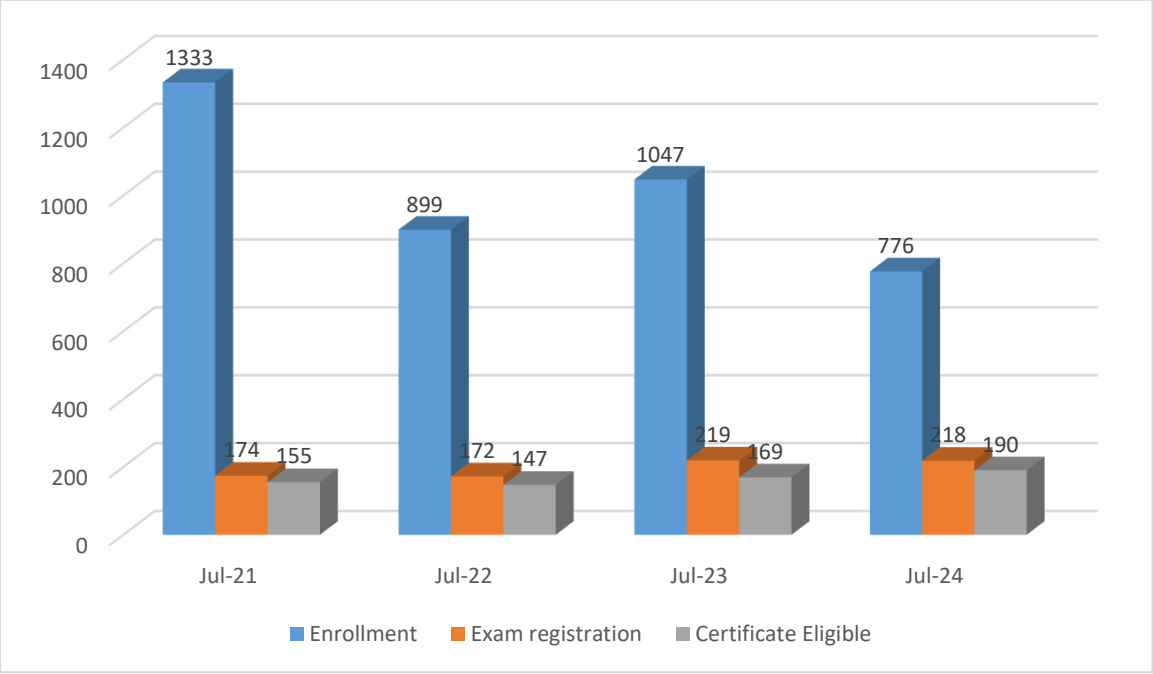
Prof. Debarshi Das
Humanities and Social Sciences

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

This is a basic course on application of mathematical techniques in economics. Students of science or engineering background would find it helpful since they have grounding in mathematics. The course will enable them to explore the subject of economics. If they want to branch out to economics or finance this course would give them training of the kind of mathematical applications used in these subjects. Students of economics and other social sciences would also benefit from this course.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	1333	174	155
Jul-Dec 2022	Rerun	899	172	147
Jul-Oct 2023	Rerun	1047	219	169
Jul-Oct 2024	Rerun	776	218	190



Optimization Methods for Civil Engineering

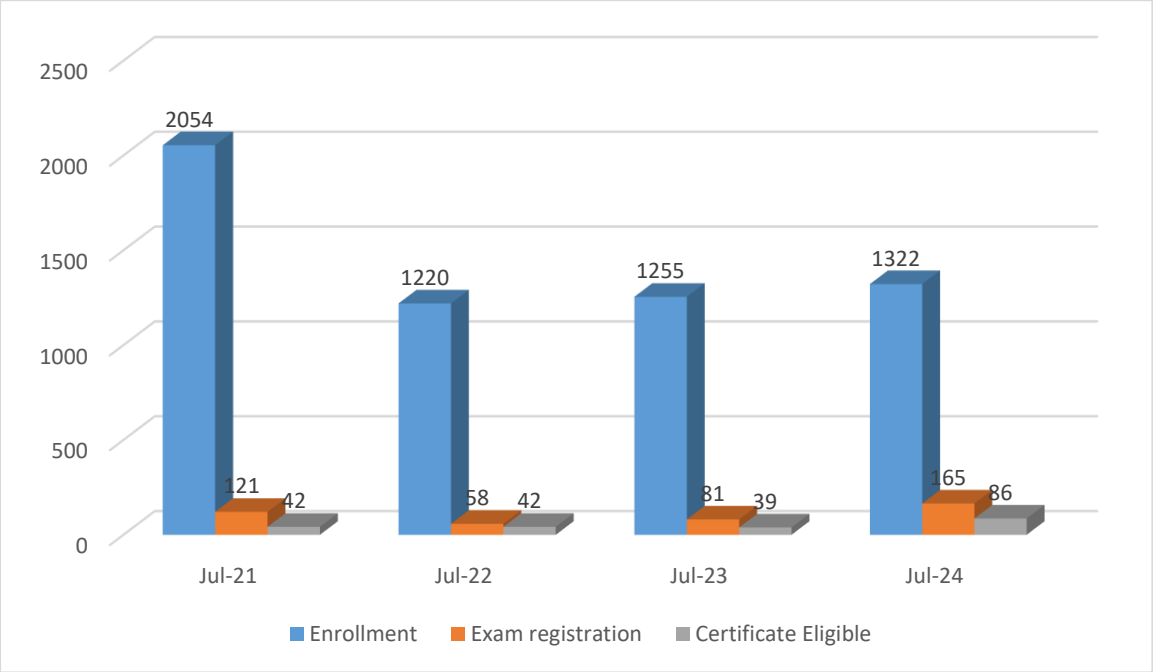
Prof. Rajib Kumar Bhattacharjya
Civil Engineering

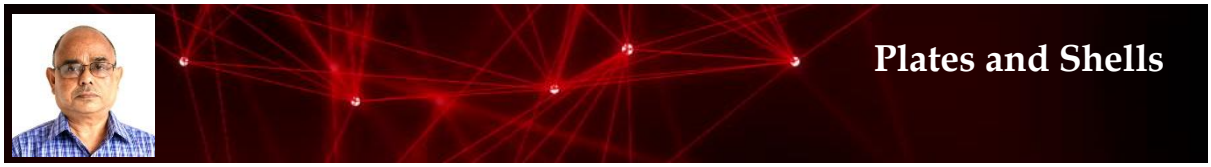
Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

The primary objectives of the course are to introducing the students to the fundamentals of classical optimization techniques and also exposing them to the theory of different non-classical optimization methods and algorithms developed for solving various types of civil engineering optimization problems.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	2054	121	42
Jul-Dec 2022	Rerun	1220	58	42
Jul-Oct 2023	Repeat	1255	81	39
Jul-Oct 2024	Repeat	1322	165	86





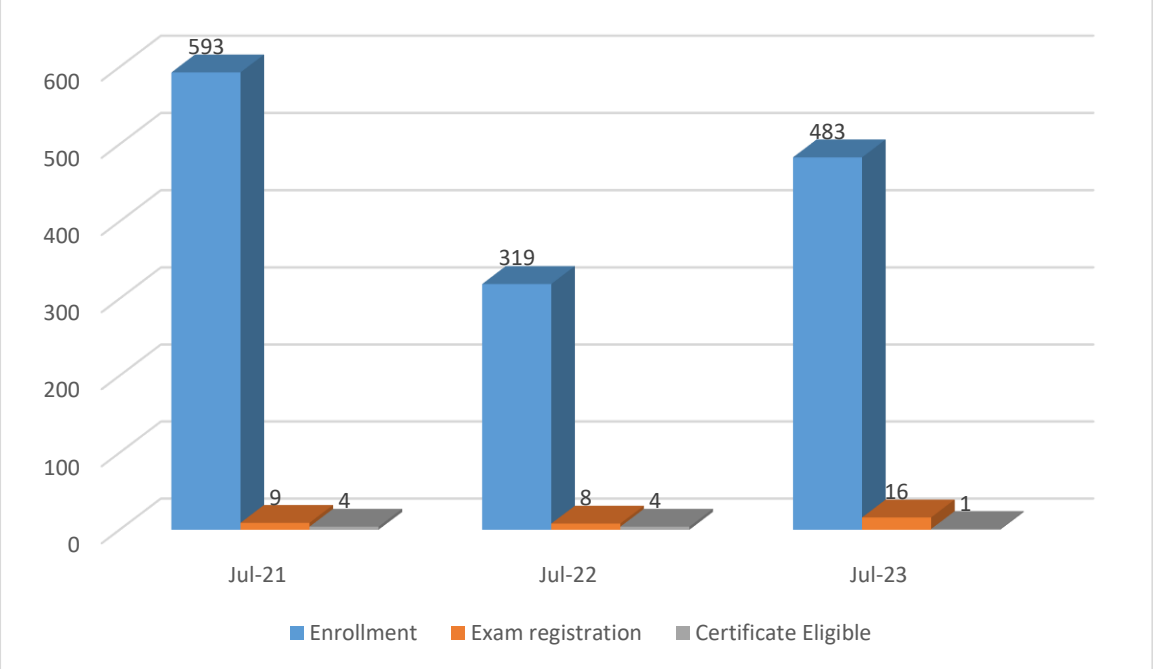
Prof. Sudip Talukdar
Civil Engineering

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

Plates and shells exhibit two dimensional structural actions that result in stronger, thinner and lighter structures and therefore, have economic advantage. This has opened the scope for the wide use of such elements in all fields of engineering due to significant increase of strength/weight ratio. This course is usually taught in Master's degree level either as separate elective subject or including some principal topics in Continuum Mechanics. The exposure to this course and its completion are very essential in understanding the behaviour of thin structures for their applications in design. The proposed course is framed for post graduate level elective subjects for 12 weeks' duration. The syllabus includes various topics of the linear elastic plate and shell theories, formulation of problems for different load cases and boundary conditions, finding closed form solutions and discussions of their limitations. The approximate methods, in case the closed form solutions are not available have also been included in the syllabus. The course is divided into 12 modules in which each module consists of 3 or 4 lecture hours. The assignment after the end of each module in MCQ/ Fill in the blanks or problem-solving mode will be offered to the participants and asked to submit for evaluation. Evaluation is planned in off-line mode.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	593	9	4
Jul-Dec 2022	Rerun	319	8	4
Jul-Oct 2023	Repeat	483	16	1



Sociology of Development

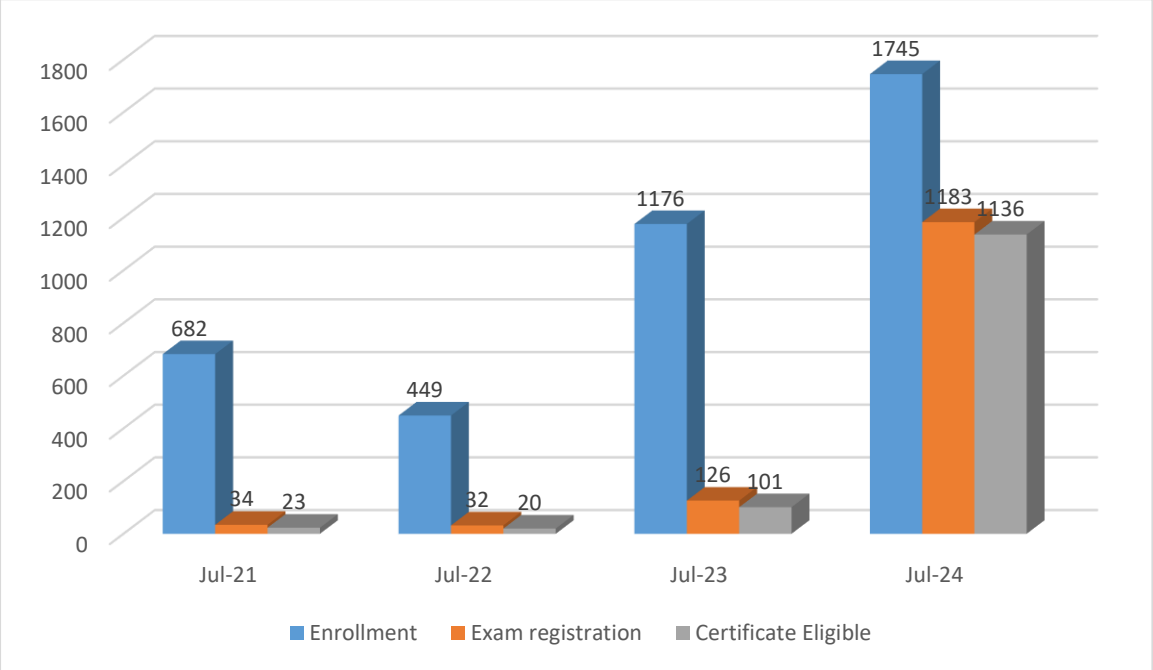
Prof. Sambit Mallick
Humanities and Social Sciences

Type of the course: New, July 2021 run Duration: 12 weeks

Course Outline:

The objective of the course is to familiarize students with the current issues and debates concerning development. The concept of development, as historically conditioned, has had several connotations, starting from incessant preoccupation with economic growth during the years following independence to the current engagement with the human and social development with active inclusion of local communities in the process. The course attempts to understand the current practices of development by an analysis of the approaches, agencies and issues involved in it.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	682	34	23
Jul-Dec 2022	Rerun	449	32	20
Jul-Oct 2023	Rerun	1176	126	101
Jul-Oct 2024	Repeat	1745	1183	1136



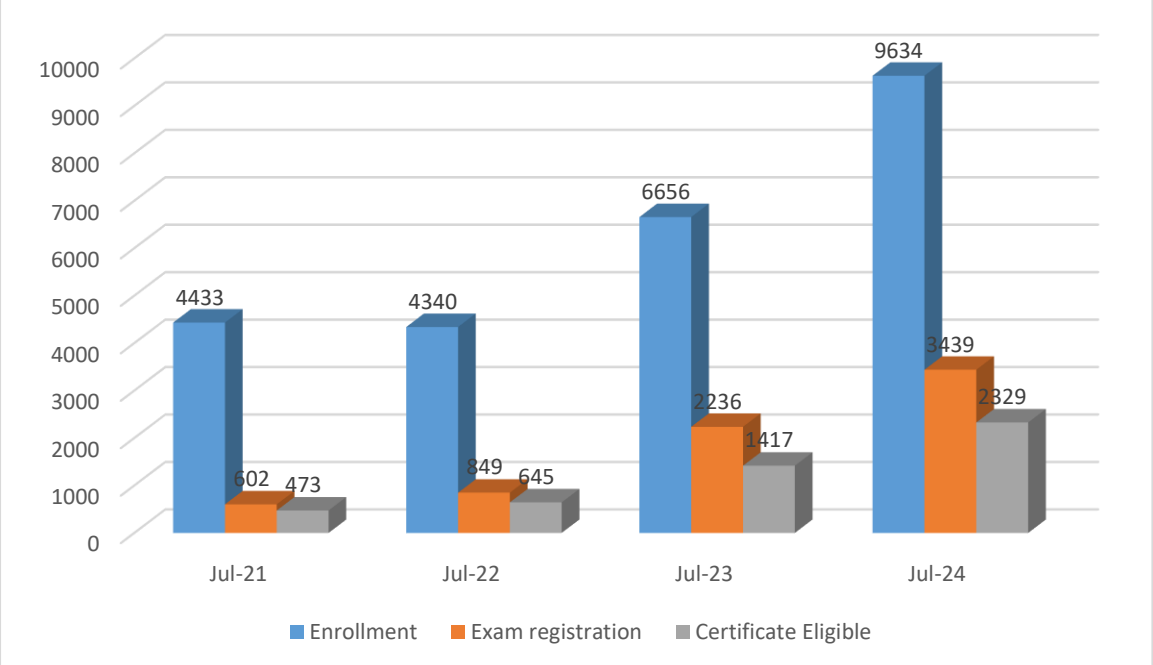
Prof. Shaik Rafi Ahamed
Electrical and Electronics Engineering

Type of the course: New, July 2021 run Duration: 08 weeks

Course Outline:

A comprehensive resource on Verilog HDL for beginners and experts large and complicated digital circuits can be incorporated into hardware by using Verilog, a hardware description language (HDL). A designer aspiring to master this versatile language must first become familiar with its constructs, practice their use in real applications, and apply them in combinations in order to be successful.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2021	New	4433	602	473
Jul-Dec 2022	Rerun	4340	849	645
Jul-Oct 2023	Rerun	6656	2236	1417
Jul-Oct 2024	Rerun	9634	3439	2329



Welding Application Technology

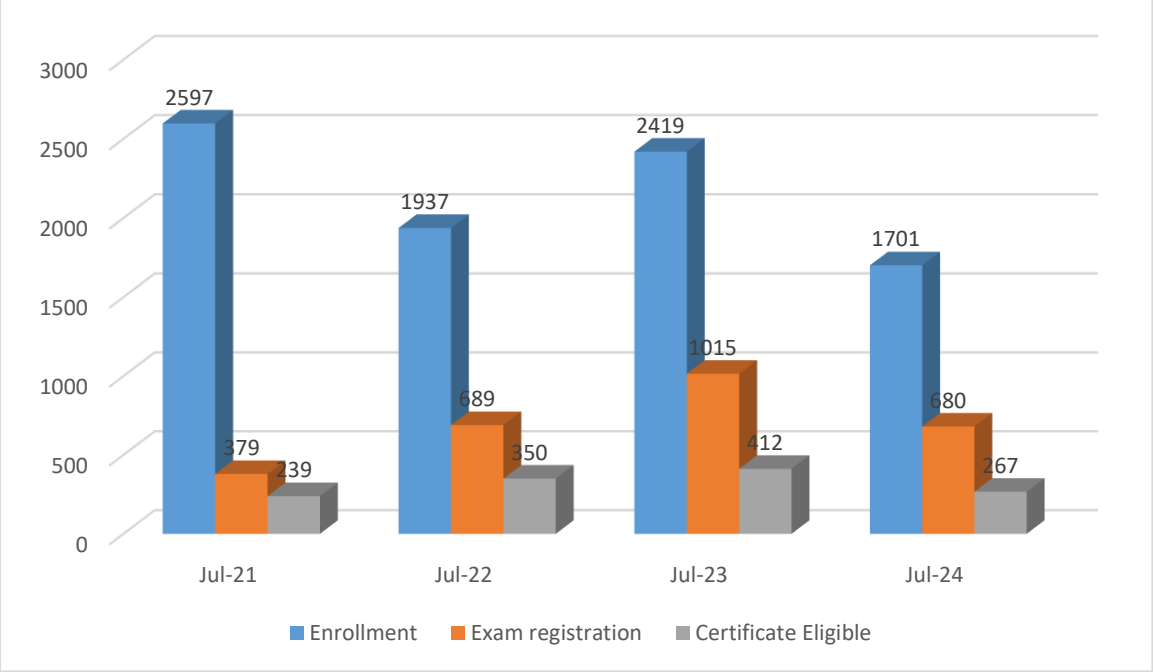
Prof. Pankaj Biswas
Mechanical Engineering

Type of the course: New, July 2021 run Duration: 8 weeks

Course Outline:

The name of the course is Welding Application Technology. As the name implies in this course I will try to cover the fundamental overview of the traditional/ industrial welding technology especially those welding processes which are widely used in manufacturing industries. I will also try to cover the detail concepts of design and analysis of welding joints, heat treatment and weld induced residual stresses & distortions and its measurement. This will help the participants to understand and apply this knowledge of welding in practice for various industrial applications. It will also encourage academic participants to increase the research interest in the field of welding. In this present course the primary focus is on basic fundamental of welding and its importance in industries. The brief overview of the course content can be stated like; this course will cover the industrial relevance of welding processes. It will give the fundamental knowledge of various important welding processes which includes most of the important fusion welding, solid state welding (i.e. Friction Welding, FSW etc.) and solid-liquid state welding (i.e. Shouldering and Brazing). It will also cover the importance and applications of all these welding techniques. This course will highlight the safety precautions to be followed in different welding techniques. This course also will cover the basic concepts of weld induced residual stresses and distortions. In this course, the concepts of different residual stresses measurements techniques will be provided. This course also will provide the fundamental concepts of residual stresses and distortions mitigation techniques. This course also will provide the basic fundamental concept on design and analysis of welding joints. This course includes most of the important topics related to static analysis of welded joints which included â€˜Design and Analysis of Butt and Fillet Welds Joints, Strength Calculation of Parallel & Transverse Fillet Welds, Analysis of Eccentrically Loaded Welded Joint, Analysis of Welded Joint Subjected to Bending Momentâ€™.

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2021	New	2597	379	239
Jul-Dec 2022	Rerun	1937	689	350
Jul-Oct 2023	Rerun	2419	1015	412
Jul-Oct 2024	Rerun	1701	680	267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267
Jul-21
Jul-22
Jul-23
Jul-24
Enrollment
Exam registration
Certificate Eligible

Basics of Biology

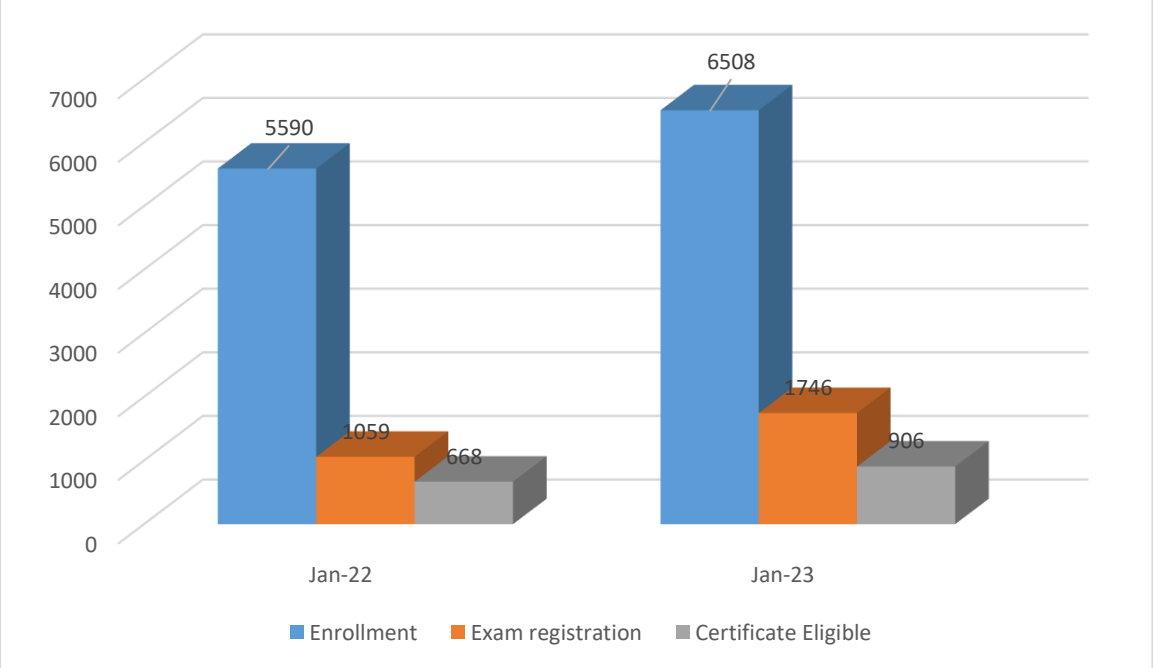
Prof. Vishal Trivedi
Biosciences and Bioengineering

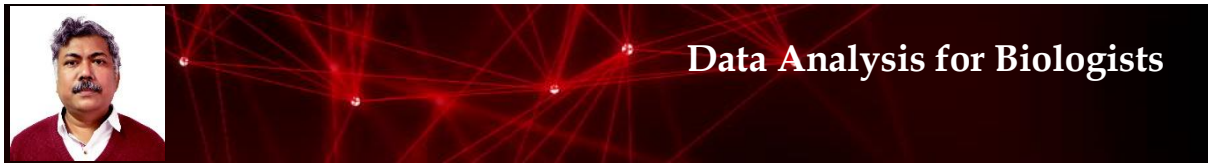
Type of the course: New, Jan 2022 run Duration: 12 weeks

Course Outline:

In the current MOOCs course, I have put effort to discuss different aspects of biology for engineer graduate students. The course will discuss in detail about human physiology and that will help the student to understand the working principles of different process as well as mechanism of different types of diseases. It will help student to understand the general biology as well as they may be able to integrate their engineer skills to take-up and solve challenging questions related to daily life. By the end of this course, student will be able to understand: 1. Basics of biology and different types of organisms in universe. 2. Understanding different types of cells and their structure and functions. 3. Molecular Cell biology and mechanism of different cellular processes. 4. Human physiology and disease biology.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	5590	1059	668
Jan-Apr 2023	Rerun	6508	1746	906





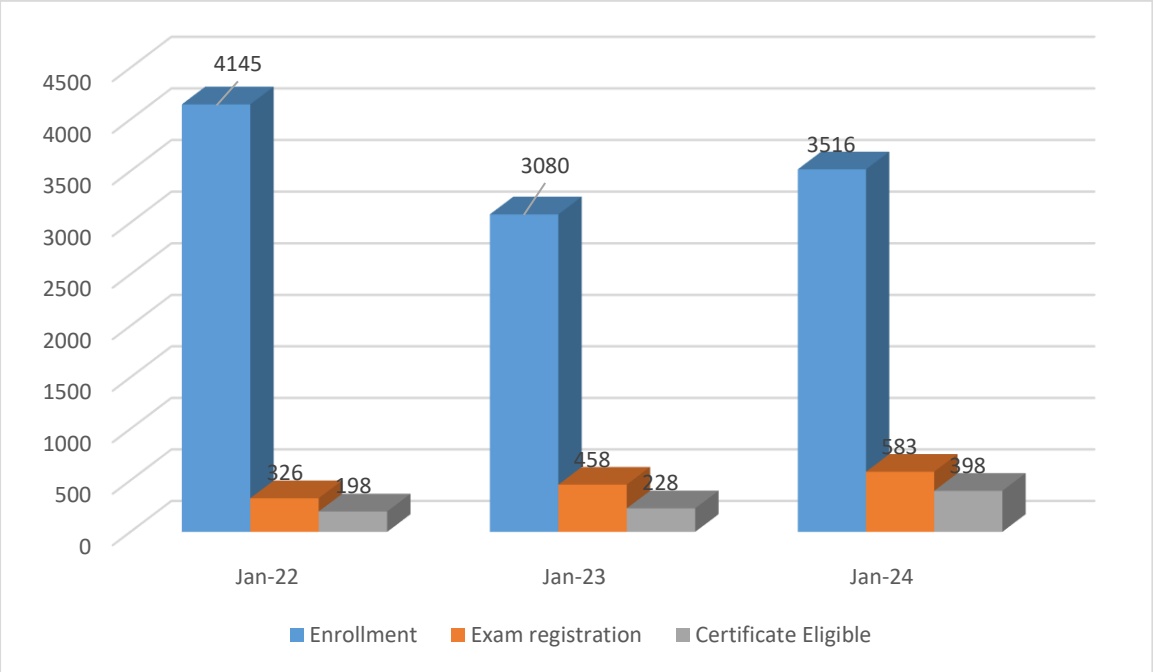
Prof. Biplab Bose
Biosciences and Bioengineering

Type of the course: New, Jan 2022 run Duration: 8 weeks

Course Outline:

Analysis of data is an integral part of biology, both in academic research and the Industry. With the advent of high-throughput techniques, biological data analysis has crossed the realm of classical statistical techniques and now involves techniques used by the wider data analytic and machine learning community. It is now expected that every biology student is acquainted with the key concepts and tools of data analysis. This course is designed specifically for biology students to learn the key concepts, applications, and limitations of commonly used data analysis techniques. This course emphasizes visualization and analysis of higher-dimensional data, like clustering, classification, and dimensionality reduction.

Timeline	Type	Enrolled	Registered	Certified
Feb-Apr 2022	New	4145	326	198
Jan-Mar 2023	Rerun	3080	458	228
Jan-Mar 2024	Rerun	3516	583	398



Design of Power Electronic Converters

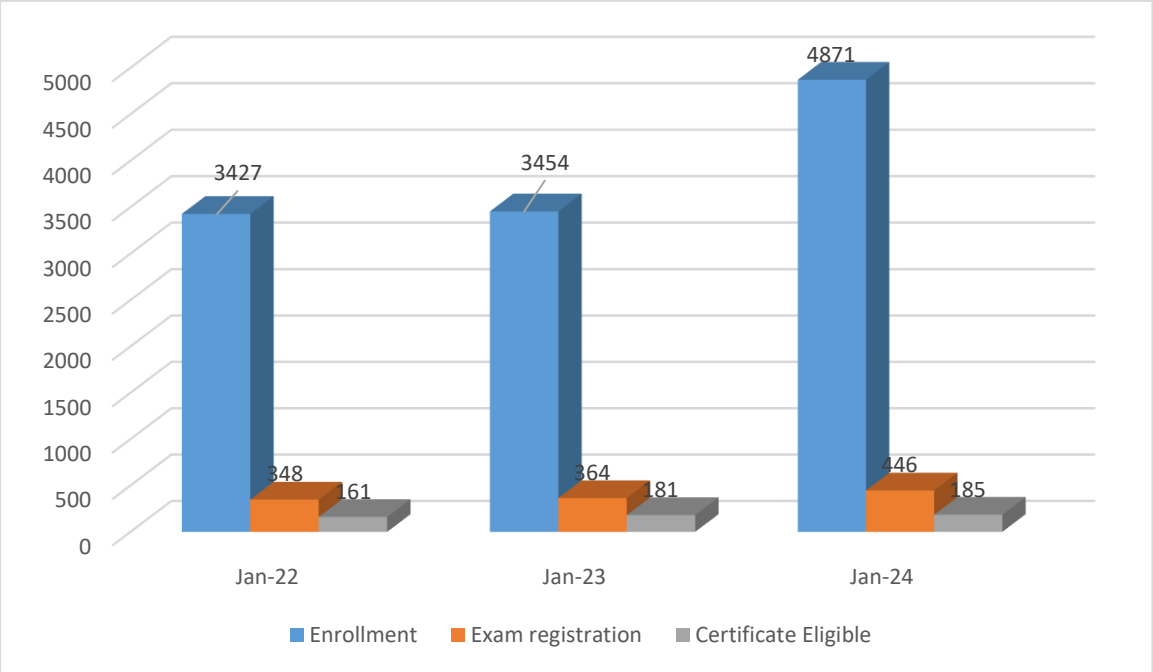
Prof. Shabari Nath
Electronics and Electrical Engineering

Type of the course: New, Jan 2022 run Duration: 8 weeks

Course Outline:

Undergraduate level courses on power electronics teach different power converter circuits and methods to analyze them. But all jobs related to power electronics need good knowledge of designing hardware. Proper hardware design in power electronics involves knowledge of several topics which are beyond the scope of a core course in power electronics. This course intends to fill this gap. In this course, students will learn the important concepts needed to design proper power electronic hardware, simulation tools, proper designing of power PCB, designing magnetics, reducing electromagnetic interference etc. By the end of course students should be able to design and test any power electronic converter on their own.

Timeline	Type	Enrolled	Registered	Certified
Feb-Apr 2022	New	3427	348	161
Jan-Apr 2023	Rerun	3454	364	181
Jan-Apr 2024	Rerun	4871	446	185



Prof. Ayon Ganguly
Mathematics

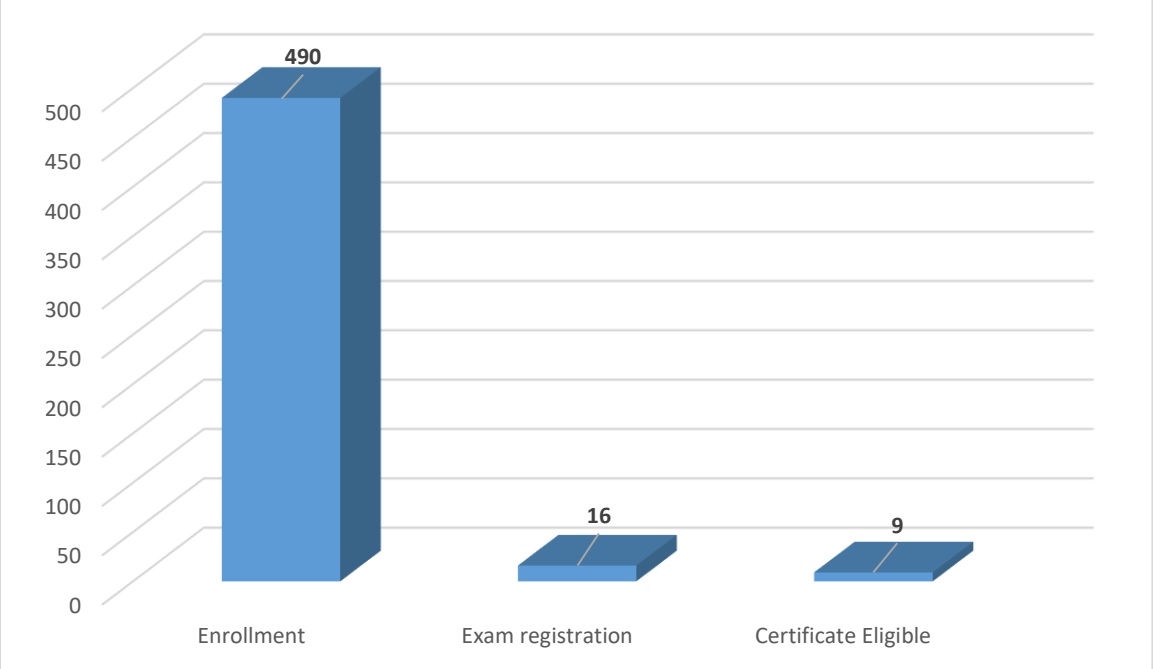
Prof. Subhamay Saha
Mathematics

Type of the course: New, Jan 2022 run
Duration: 8 weeks

Course Outline:

In this course we will cover discrete-time Markov chains and Poission Processes. Knowledge of basic probability is essential for this course. The mathematical rigor of the course will be at an undergraduate level. We will cover from basic definition to limiting probabilities for both discrete -time Markov chains. We will discuss in detail Poisson processes, the simplest example of a continuous-time Markov chain. The course will involve a lot of illustrative examples and worked out problems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2022	New	490	16	9



Engineering Hydrology

Prof. Sreeja Pekkat
Civil Engineering

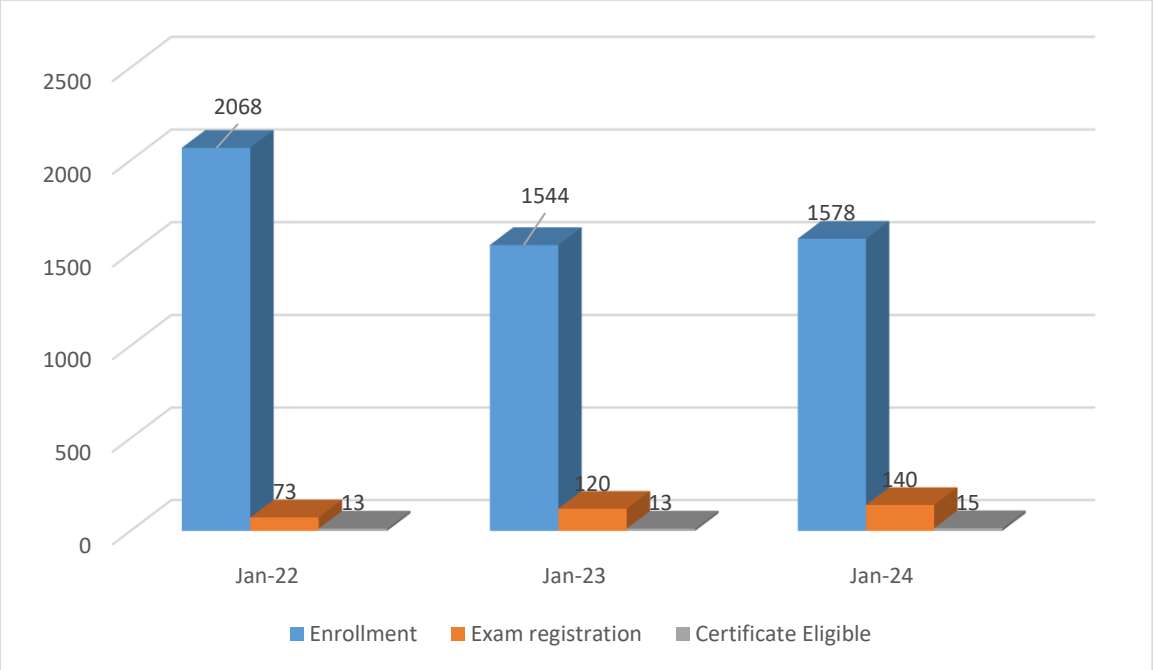
Type of the course: New, Jan 2022 run

Duration: 12 weeks

Course Outline:

This course on engineering hydrology aims to impart knowledge on the processes that secure the most valuable natural resource: WATER. It deals with the complex interaction and pathways of water connecting atmosphere, lithosphere and hydrosphere. This course will give an idea on how the hydrological science is mathematically quantified for engineering applications to manage water resources. The knowledge acquired in this course will be pre-requisite for different advanced level courses in post-graduate. The course starts with the explanation of hydrological processes related to atmosphere, surface and subsurface regime. This is followed by the explanation on hydrological analysis, which is mandatory for the design of hydraulic structures. The course ends with basic discussion on hydrological statistics important for dealing significant amount of data and its uncertainties, which forms the backbone of hydrological analysis.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	2068	73	13
Jan-Apr 2023	Rerun	1544	120	13
Jan-Apr 2024	Repeat	1578	140	15



Expansive Soil

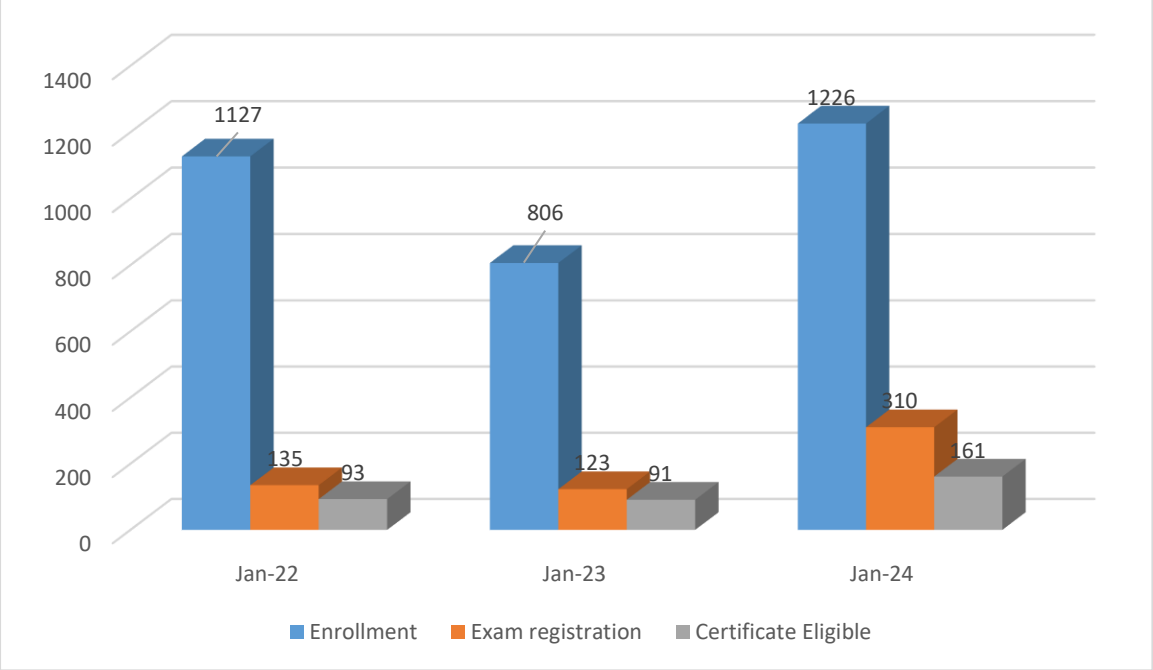
Prof. Anil Kumar Mishra
Civil Engineering

Type of the course: New, Jan 2022 run Duration: 8 weeks

Course Outline:

Expansive soil occurs in many parts of the world particularly in arid and semi-arid regions. These soils undergo volumetric changes upon wetting and drying, thereby causing ground heave and settlement problems. Cracking associated with the shrinkage is of concern for embankment and earth-dam stability. This leads to considerable construction defects if not adequately taken care of. Such soils are considered natural hazards and pose challenges to civil engineers.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2022	New	1127	135	93
Jan-Mar 2023	Rerun	806	123	91
Jan-Mar 2024	Rerun	1226	310	161



Introduction to Queueing Theory

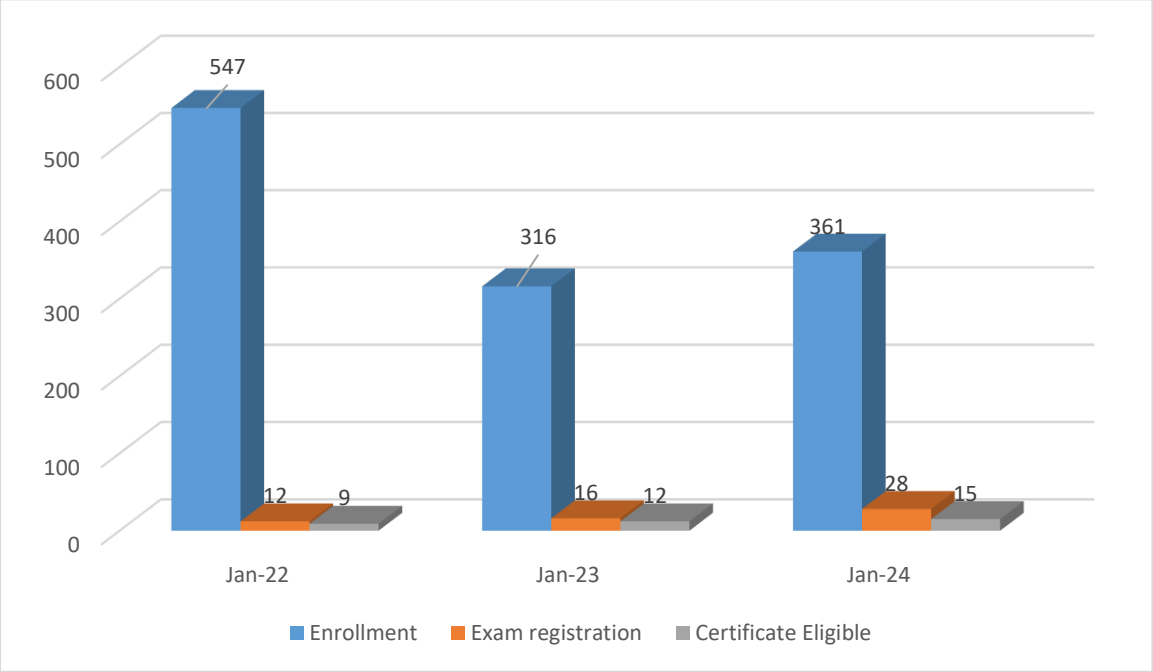
Prof. N. Selvaraju
Mathematics

Type of the course: New, Jan 2022 run Duration: 12 weeks

Course Outline:

This course gives a detailed introduction into queueing theory along with the stochastic processes techniques useful for modelling queueing systems. A queue is a waiting line, and a queueing system is a system which provides service to some jobs (customers, clients) that arrive with time and wait to get served (Examples: - a telecommunication system that processes requests for communication; - a hospital facing randomly occurring demand for hospital beds; - central processing unit that handles arriving jobs). Queueing theory is a branch of applied probability theory dealing with abstract representation and analysis of such systems. Its study helps us to obtain useful and unobvious answers to certain questions concerning the performance of systems which in turn would help to design better systems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	547	12	9
Jan-Apr 2023	Rerun	316	16	12
Jan-Apr 2024	Repeat	361	28	15



Language, Culture and Cognition: An Introduction

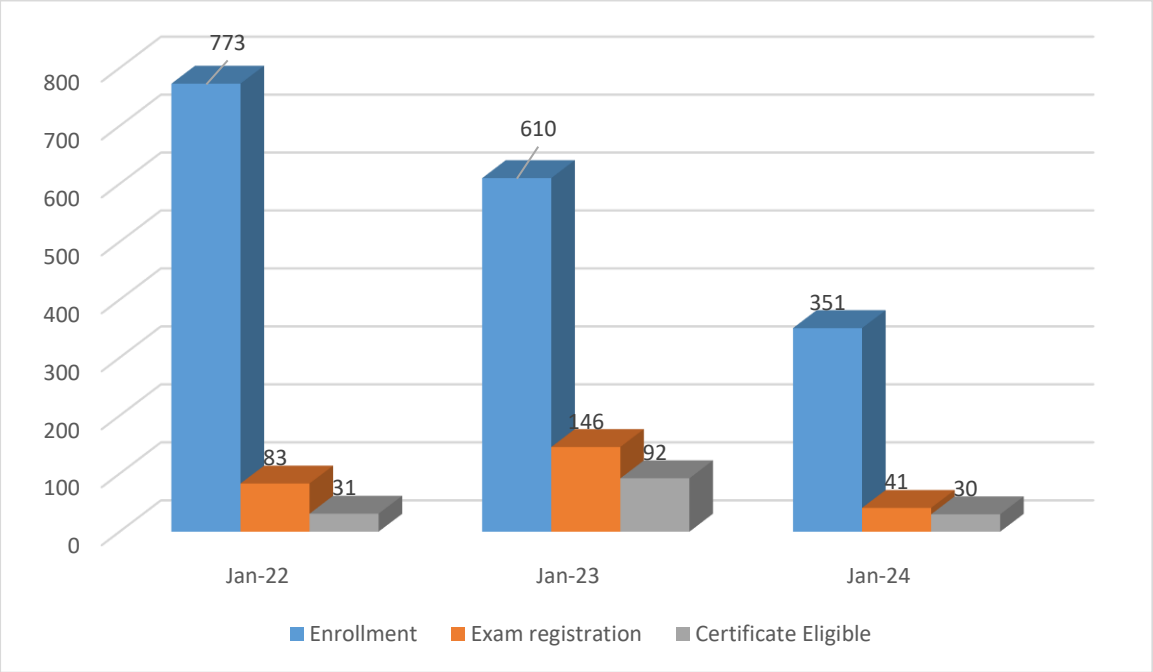
Prof. Bidisha Som
Humanities and Social Sciences

Type of the course: New, Jan 2022 run Duration: 8 weeks

Course Outline:

The course approaches language studies from the cognitive science perspective. Language does not work in a vacuum and is related to another mental faculty. Together they help us humans make sense of our experiences. Again, experiences can be different from one culture to another, thus bringing in another angle to the mind and cognition relationship: culture. This course gives a brief overview of the relation between language, cognition and culture, discussed through three different angles of Cognitive Linguistics, cognitive neuroscience of language and language processing. Each of these domains will be discussed in terms of theoretical underpinning as well as the latest state of the art research. The lectures will connect language structure, brain areas responsible for various linguistic functions, relationship of language with attention, executive control and so on, embedding them in the cultural backdrop wherever applicable. The interaction between the inner and outer world of humans through language is the main focus of this course.

Timeline	Type	Enrolled	Registered	Certified
Feb-Apr 2022	New	773	83	31
Jan-Apr 2023	Rerun	610	146	92
Jan-Mar 2024	Rerun	351	41	30



Mechanics of Fiber Reinforced Polymer Composite Structures

Prof. Debabrata Chakraborty
Mechanical Engineering

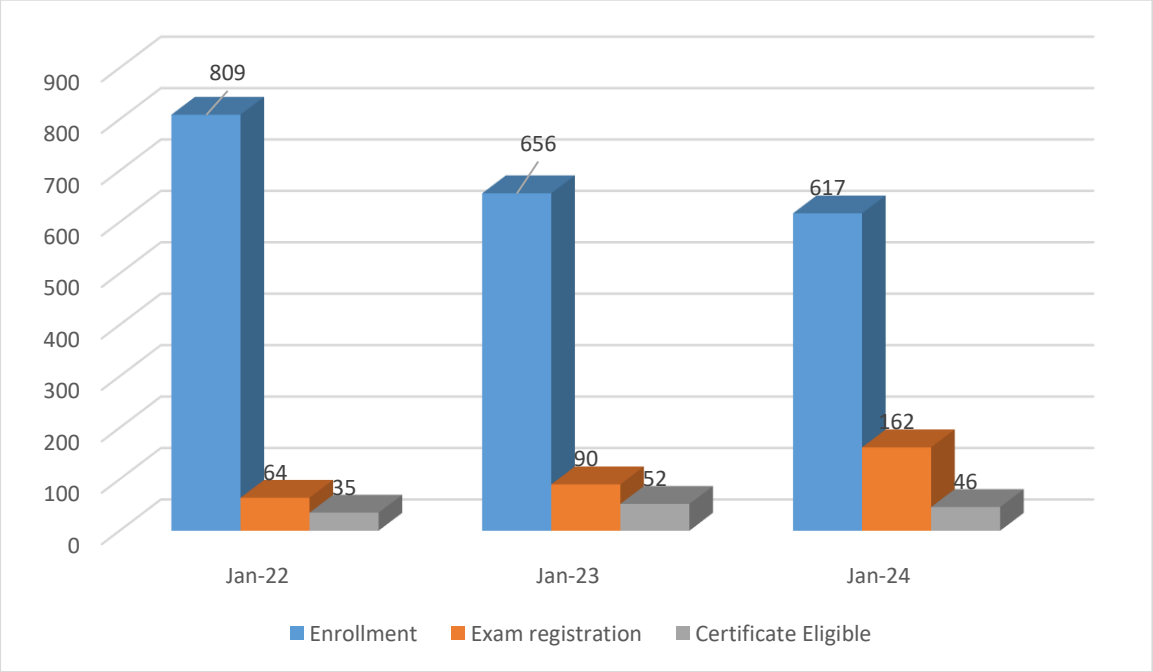
Type of the course: New, Jan 2022 run

Duration: 12 weeks

Course Outline:

This is introductory course on Mechanics of Fiber Reinforced Composite Structures. One course is basically aimed at introducing the students of mechanical, civil engineering streams to the basics of design and analysis of structural components made of FRP composites. The contents of the course are so designed that it requires the first course on strength of materials, solid mechanics as a prerequisite which is anyway a core course for mechanical, civil undergraduates. It introduces the students first to the basic mechanics (stress strain and load deformation relations) of fiber composites, possible failure modes and corresponding failure theories proposed. Next, the course introduces the design and analysis using those concepts along with the design of some components made of such materials. At the end a few topics of slightly advanced nature (for UG students) are kept for brief introduction only.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	809	64	35
Jan-Apr 2023	Rerun	656	90	52
Jan-Apr 2024	Repeat	617	162	46



Operation and Planning of Power Distribution Systems

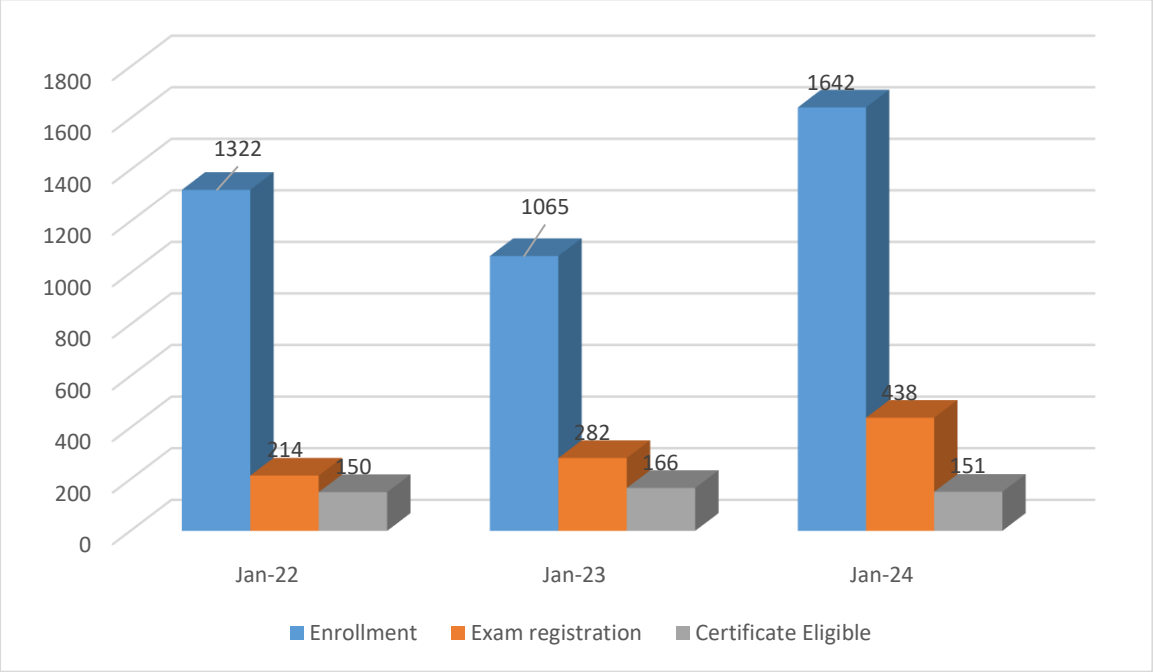
Prof. Sanjib Ganguly
Electronics and Electrical Engineering

Type of the course: New, Jan 2022 run Duration: 12 weeks

Course Outline:

Due to the inception of various automation technologies and integration of distributed energy resources, the electrical power distribution systems are slowly transformed into smart and active networks. This course will provide an overview of modern power distribution systems. The course will start with the discussions of different components and layouts of power distribution systems, load models, different reliability assessment techniques, and different planning approaches. The conventional reactive power compensation techniques will also be covered. Then, the impact of distributed generation on distribution systems will be discussed. Modeling of different types of distributed generation units and storage will also be discussed. Finally, the evolution of distribution systems toward smart network will be covered.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	1322	214	150
Jan-Apr 2023	Rerun	1065	282	166
Jan-Apr 2024	Rerun	1642	438	151



Physical and Electrochemical Characterizations in Chemical Engineering

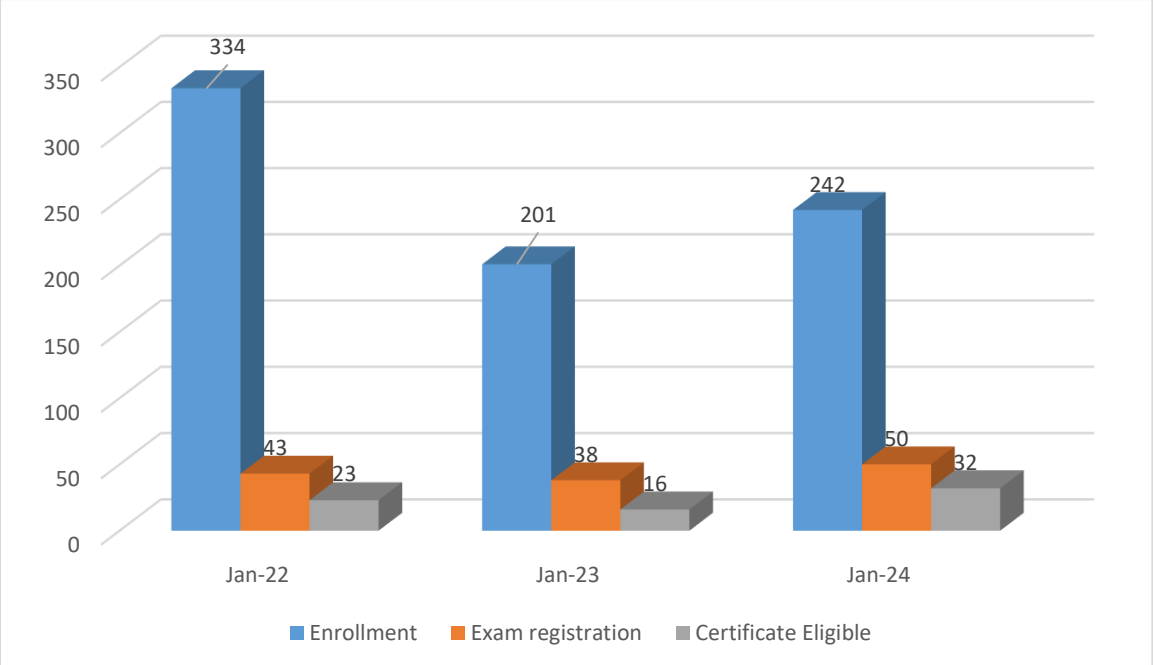
Prof. Tamal Banerjee
Chemical Engineering

Type of the course: New, Jan 2022 run Duration: 8 weeks

Course Outline:

Information on the various properties of materials are the key to unlock and analyze their suitability for various futuristic applications. The course Physical and Electrochemical Characterizations in Chemical Engineering aims to address these aspects fundamentally and practically in the field of Chemical Engineering and allied disciplines. The study span during the course includes the fundamental principles of various instrumentation techniques, which include spectroscopy, surface and electrochemical characterizations, and mechanical stability. Upon successful completion of the course, students are expected to be conversant with various characterization techniques including characterization of bio/nanostructures and nano/bio/smart materials. They are expected to become competent in carrying out analysis on the structural, thermal, chemical and mechanical properties of materials. Videos concerning the actual experiments shall also follow.

Timeline	Type	Enrolled	Registered	Certified
Jan-Mar 2022	New	334	43	23
Jan-Mar 2023	Rerun	201	38	16
Jan-Mar 2024	Repeat	242	50	32



Quantum Technology and Quantum Phenomena in Macroscopic Systems

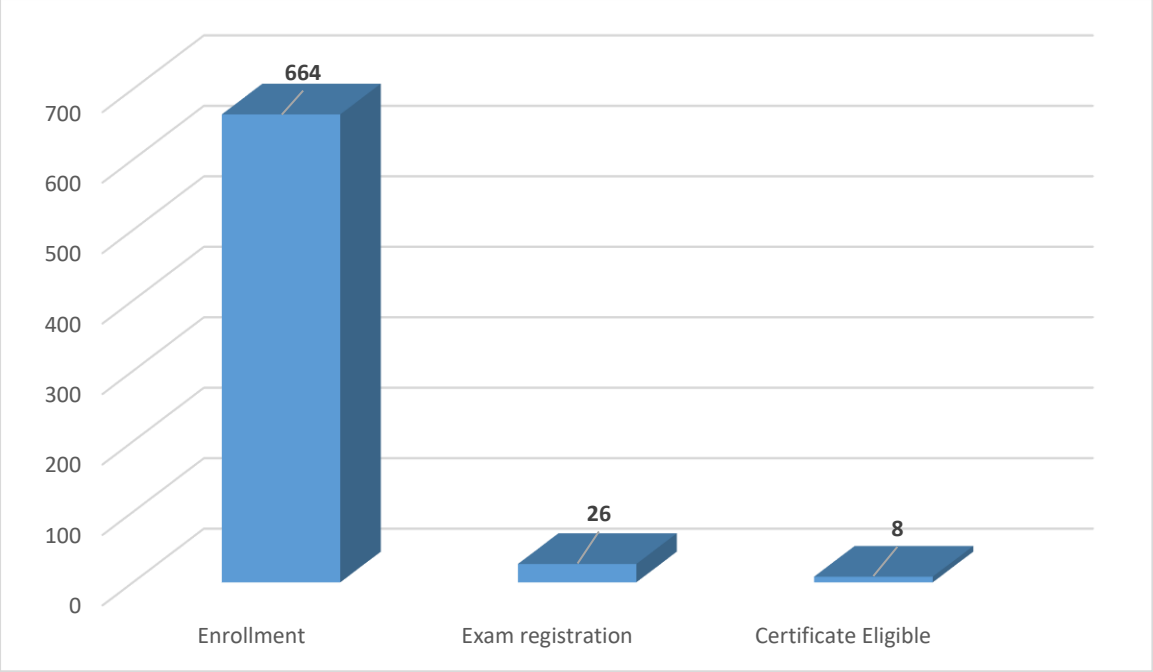
Prof. Amarendra Kumar Sarma
Physics

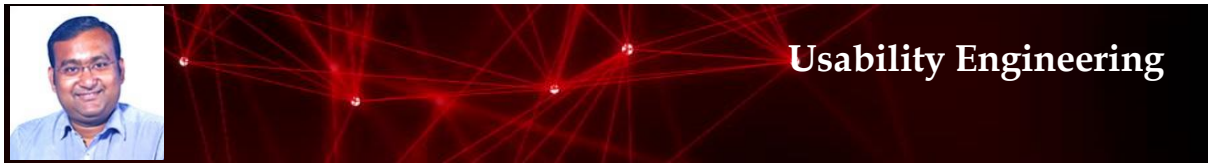
Type of the course: New, Jan 2022 run Duration: 12 weeks

Course Outline:

In recent times, owing to the rapid advancement in technology a variety of solid-state nano-systems have been realized. One needs quantum optics to describe these systems. It is understood that the next phase of technology revolution needs to use quantum mechanics. This course will enable the students to understand the fundamentals behind these upcoming quantum technologies. The course will prepare and motivate them to take a research carrier in this highly promising modern area of inter-disciplinary research.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	664	26	8





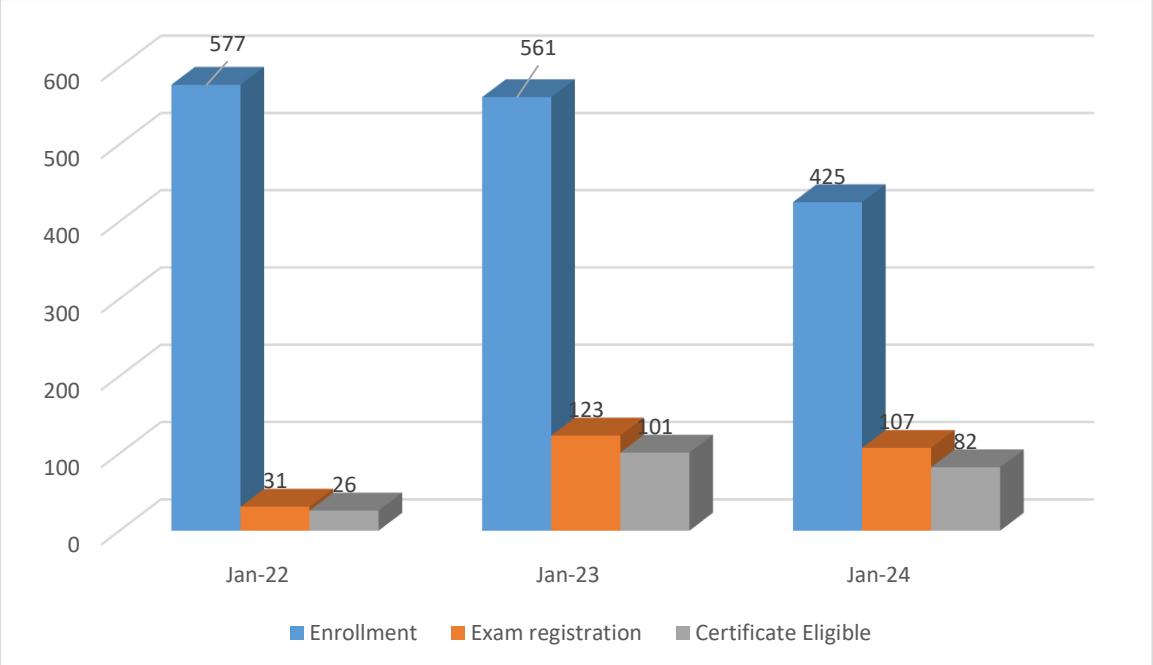
Prof. Debayan Dhar
Electronics and Electrical Engineering

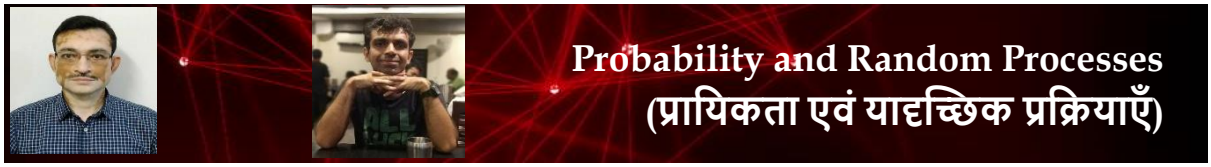
Type of the course: New, Jan 2022 run Duration: 12 weeks

Course Outline:

Rapid growth of Information and Communication technologies has given opportunities to various startups, to introduce smart products/applications in our ecosystem. In the era of globalization, competition across startups, specifically products are huge and if any start up or product fails to attract loyal consumer base, it is doomed to collapse. In order to ensure enhanced consumer interaction and their loyalty, aspects of human factors need to be engineered into these products. This is where Usability Engineering comes into existence. Usability focuses on qualitative and quantitative aspects of effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments. This is a detailed basic level course that would focus on user's psycho social and cognitive parameters, frameworks to capture and identify consumer/users' individual parameters and ways to design and conceptualize functional products around them.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2022	New	577	31	26
Jan-Apr 2023	Rerun	561	123	101
Jan-Apr 2024	Repeat	425	107	82





Prof Rohit Sinha
Electronics & Electrical Engineering

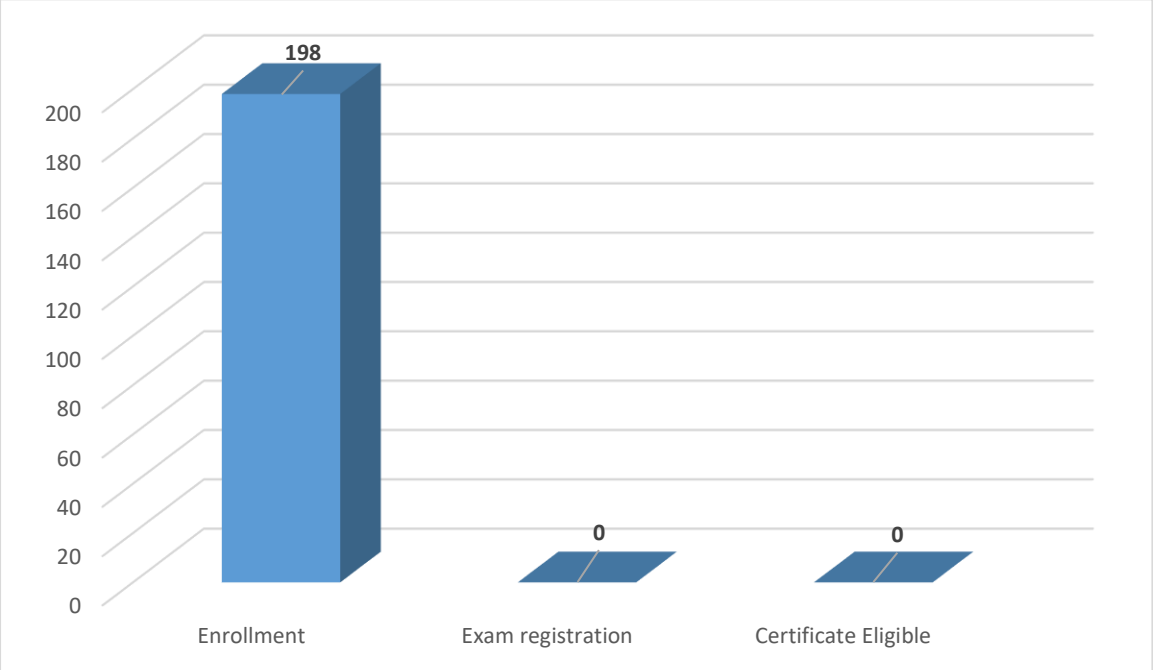
Prof. Ribhu Chopra
Electronics & Electrical Engineering

Type of the course: New run, July 2022 run
Duration: 12 weeks

Course Outline:

Viscous fluid flow covers the fundamentals of fluid mechanics from an advanced point of view with emphasis on the mathematical treatment of viscosity effects in Newtonian fluid flows. This course will cover the derivation of Navier-Stokes equations, exact solutions for simplified configurations, creeping flows, Stokess first and second problems, laminar boundary layers, wall-bounded and free-shear boundaries and hydrodynamic stability with an introduction to turbulence.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	552	0	0



Dynamics of Classical and Quantum Fields

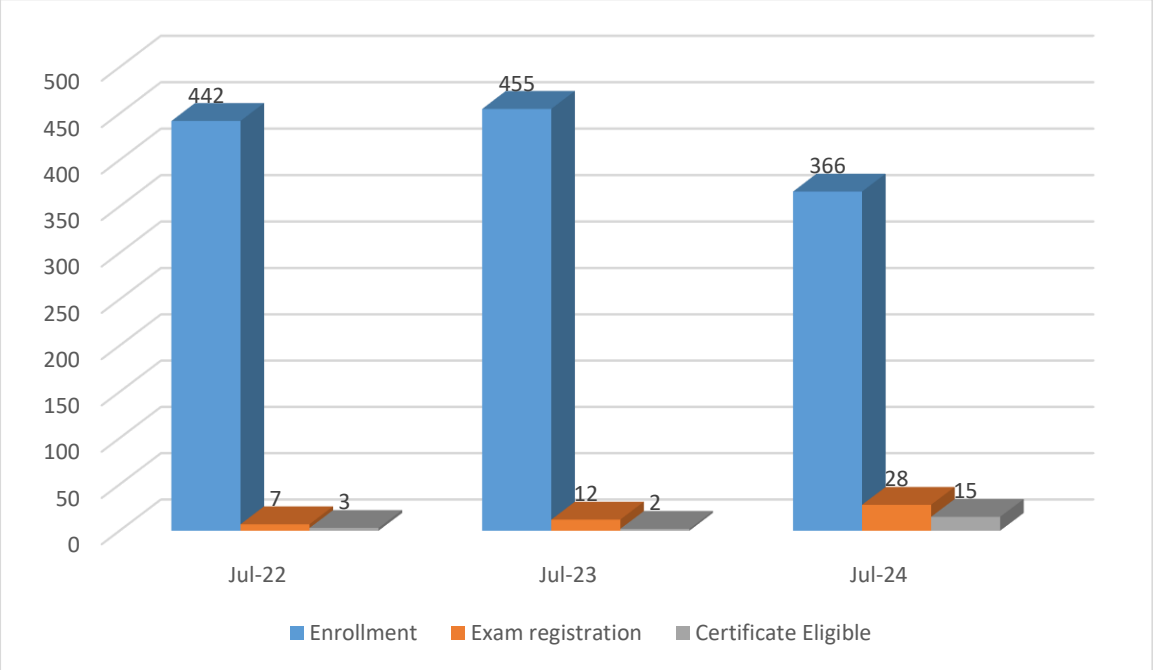
Prof. Girish S. Setlur
Physics

Type of the course: New Run, July 2022 run Duration: 12 weeks

Course Outline:

This course covers introductory topics in Classical and Quantum Fields that are typically not given due importance in the M.Sc. coursework. There is a considerable knowledge gap between the present-day M.Sc. level courses and actual PhD level research in theoretical physics. The contents of this course are carefully chosen to fill this gap and help aspiring/early stage PhD scholars come up to speed with research level topics in theoretical physics.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	442	7	3
Jul-Oct 2023	Rerun	455	12	2
Jul-Oct 2024	Repeat	366	28	15



Advanced Thermodynamics and Combustion

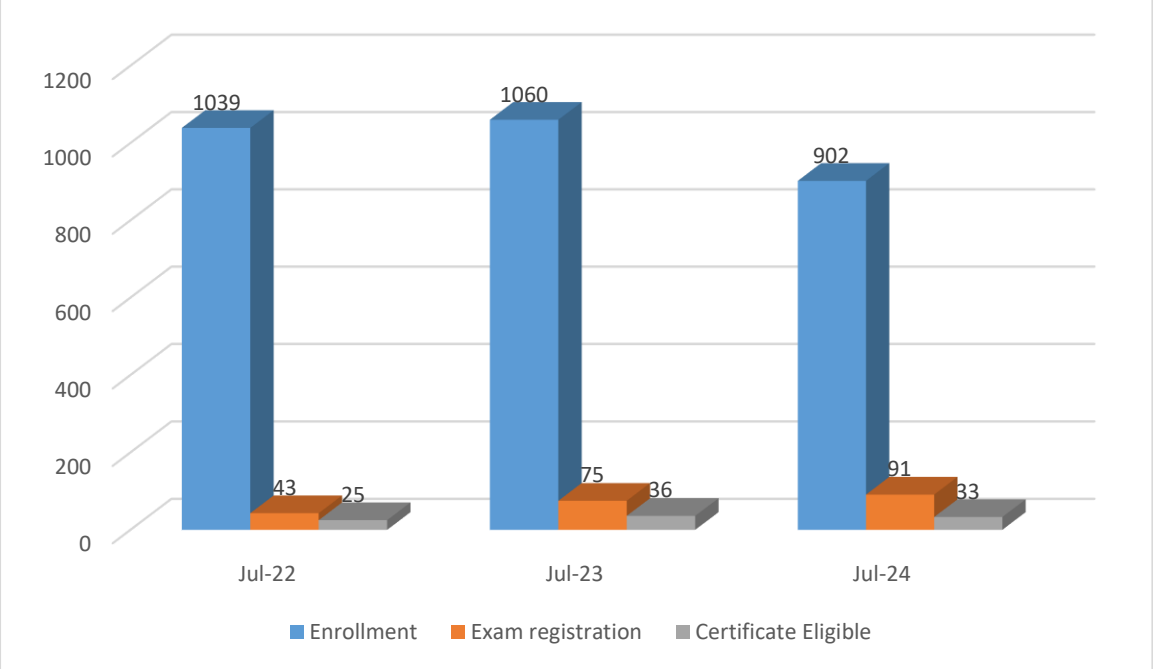
Prof. Niranjan Sahoo
Mechanical Engineering

Type of the course: New Run, July 2022 run Duration: 12 weeks

Course Outline:

"Advanced Thermodynamics" is one of the core courses in the curriculum of postgraduate (PG) syllabus in the Mechanical Engineering Discipline. Also, the fundamental course on "Combustion" is also offered as an elective for PG audience and research scholars of Mechanical, Aerospace and Energy Engineering disciplines. Classically, both courses are popular in most of the engineering colleges in the country. In these courses, the basic thermodynamic fundamentals are studied in details and the thermochemistry concepts are applied to combustion phenomena occurring in internal combustion (IC) engines, gas turbine (GT) engines, rocket propulsion etc. In this backdrop, a blended version of the course has been designed for the next generation learners. It is offered in the name of "Advanced Thermodynamics and Combustion" that highlights the thermodynamic concepts/equations in various combustion process. The course package is mainly composed of the following major contents: (a) Exhaustive discussions on entropy and exergy analysis in thermodynamic systems; (b) Thermodynamic property relations and its application to gas mixtures, phase change processes; (c) Combustion fundamentals involving premixed and non-premixed flames for laminar and turbulent combustion; (d) Combustion phenomena in practical occurring applications such IC and GT engines.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	1039	43	25
Jul-Oct 2023	Rerun	1060	75	36
Jul-Oct 2024	Repeat	902	91	33



Design & Implementation of Human-Computer Interfaces

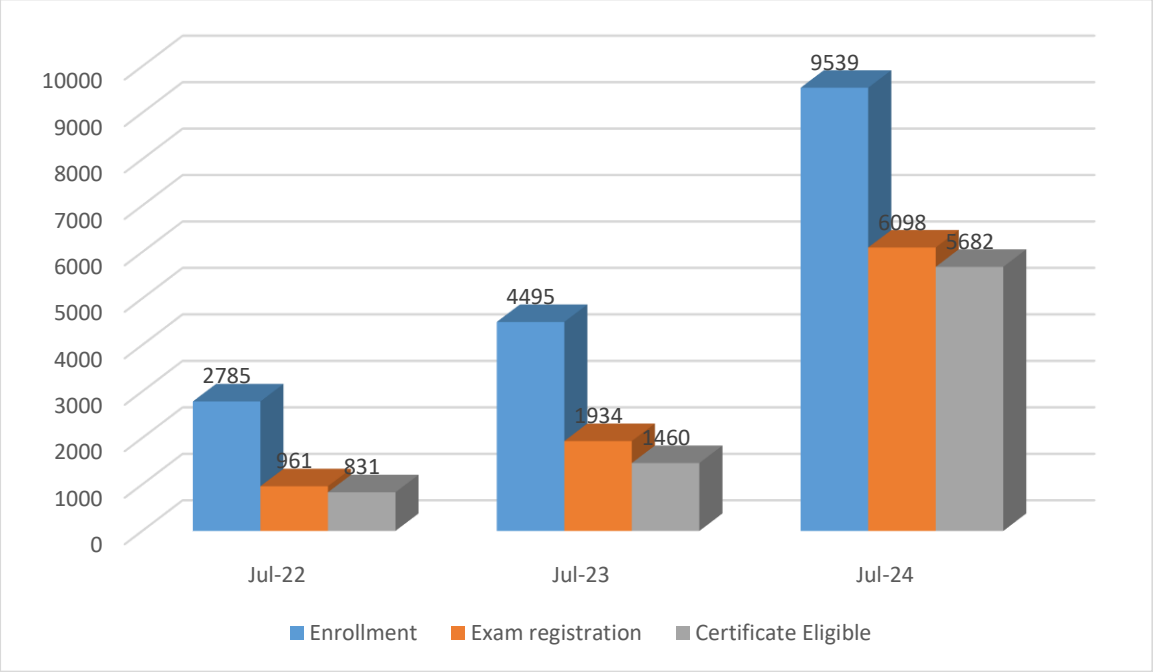
Prof. Samit Bhattacharya
Computer Science & Engineering

Type of the course: New Run, July 2022 run Duration: 12 weeks

Course Outline:

Human-computer interfaces have become very much part of our lives, due to the proliferation of large number of consumer electronic products. The key issue is to make the products usable to lay-persons. As a result, the main concern is usability and how to ensure it for the product. As it happens, development of a usable system follows a process consisting of stages. In this course, we shall learn the stages a system should follow to be usable. In the first few lectures (first week), we will get introduced to the human-computer interfaces, concept of usability and its engineering (including the stages). In the subsequent lectures, the stages will be covered. Weeks 2 and 3 are devoted to the topics on identification of usability requirements. In week 4, we shall learn about the fundamental concepts involved in usable design. Evaluation of the design to ensure usability is covered in week 5. Weeks 6 and 7 contains lectures on converting the design to an information system. Implementation of the system is discussed in weeks 8-10. Week 11 will cover the concepts related to the evaluation for system usability. In the final week (12), we will cover few related topics and conclude the course.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	2785	961	831
Jul-Oct 2023	Rerun	4495	1934	1460
Jul-Oct 2024	Rerun	9539	6098	5682



Natural Resources Management

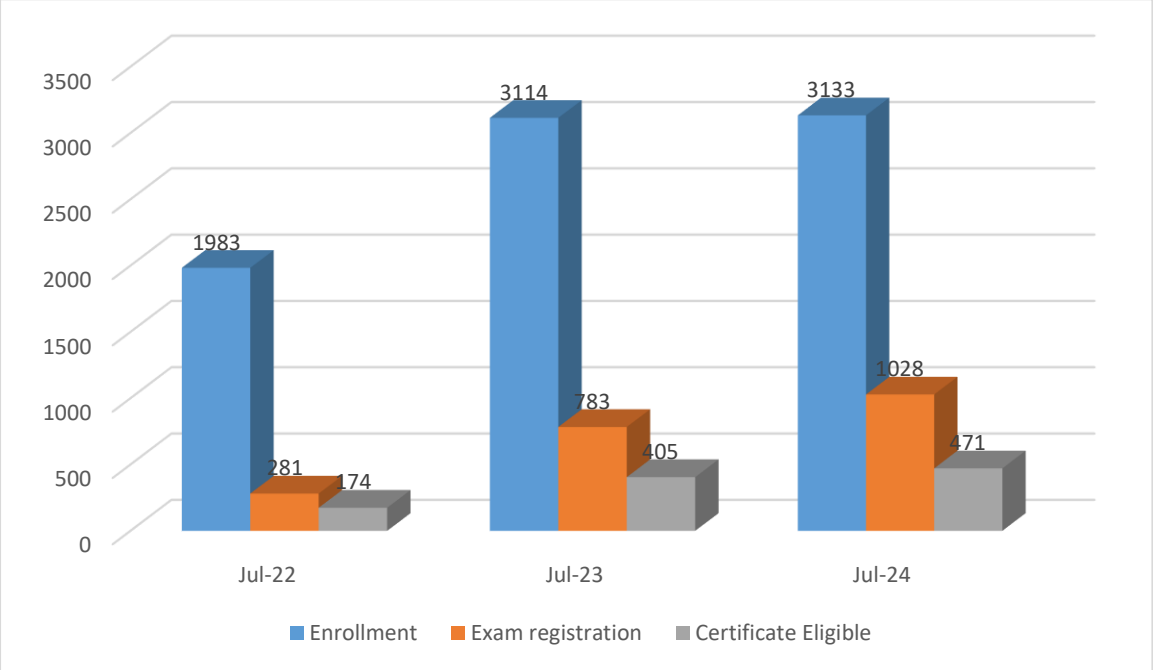
Prof. Sudip Mitra
School of Agro and Rural Technology

Type of the course: New Run, July 2022 run Duration: 12 weeks

Course Outline:

This course focuses on the need of sustainable management of the Earth's depleting natural resources such as soil, water, forest, minerals and biological resources, in relation to the growth of the human population. The range of topics covered in the course will provide students with a wider perspective on many national and international natural resource management (NRM) issues. Farm based technologies and simulation modeling is an important aspect of modern day NRM. Appropriate NRM is the key to the sustainable development.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	1983	281	174
Jul-Oct 2023	Rerun	3114	783	405
Jul-Oct 2024	Rerun	3133	1028	471



Genome Editing and Engineering

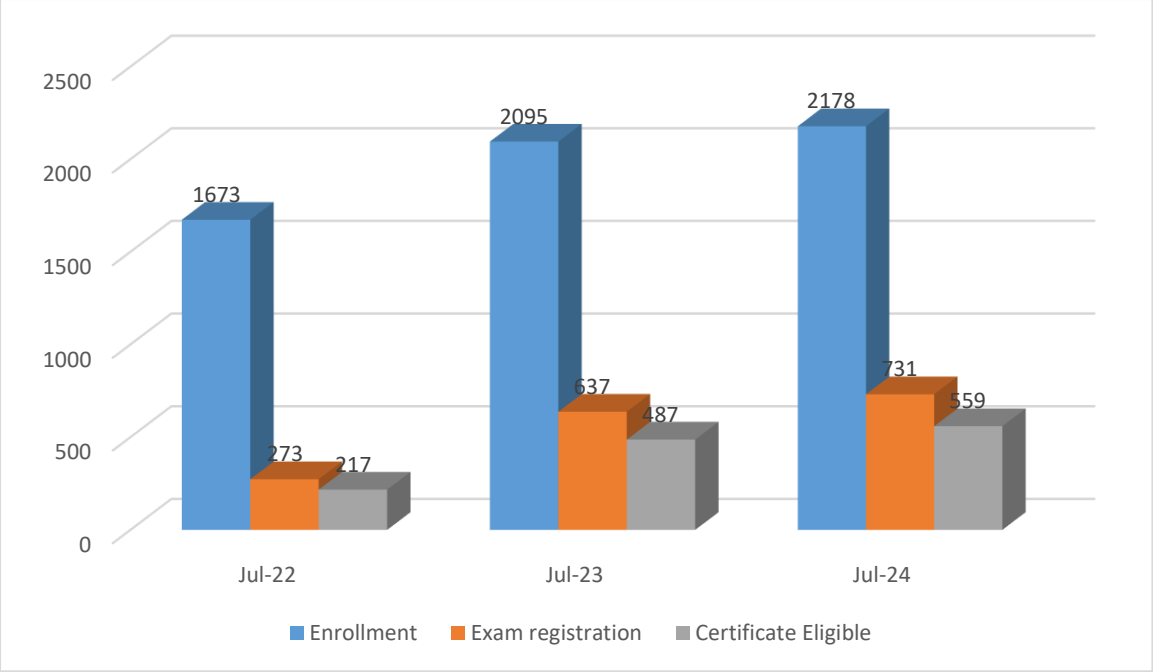
Prof. Utpal Bora
Biosciences and Bioengineering

Type of the course: New Run, July 2022 run Duration: 12 weeks

Course Outline:

This course is designed for UG & PG students, research scholars and young scientists to introduce them to basics and applications of genome editing and engineering. The course starts with understanding of basic organization and structure of genome. It gives a brief overview on different DNA strand breaks and their repair mechanism. It introduces learners to theoretical basics of genetic engineering and discusses its limitations in tackling genetic problems of animals and plants. The key concepts of Genome editing are discussed thoroughly with emphasis on the major genome editing tools ZFN, TALEN and CRISP/Cas9. It discusses the biochemical basis of development of the genome editing tools, their design and their applications in various genetic conditions. It also discusses the scope and prospect of using these technologies in solving major genetic disease of human. The learners will also be acquainted with the ethical concerns associated with applications of genome editing and engineering in germline.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	1673	273	217
Jul-Oct 2023	Rerun	2095	637	487
Jul-Oct 2024	Rerun	2178	731	559



Laser Based Manufacturing

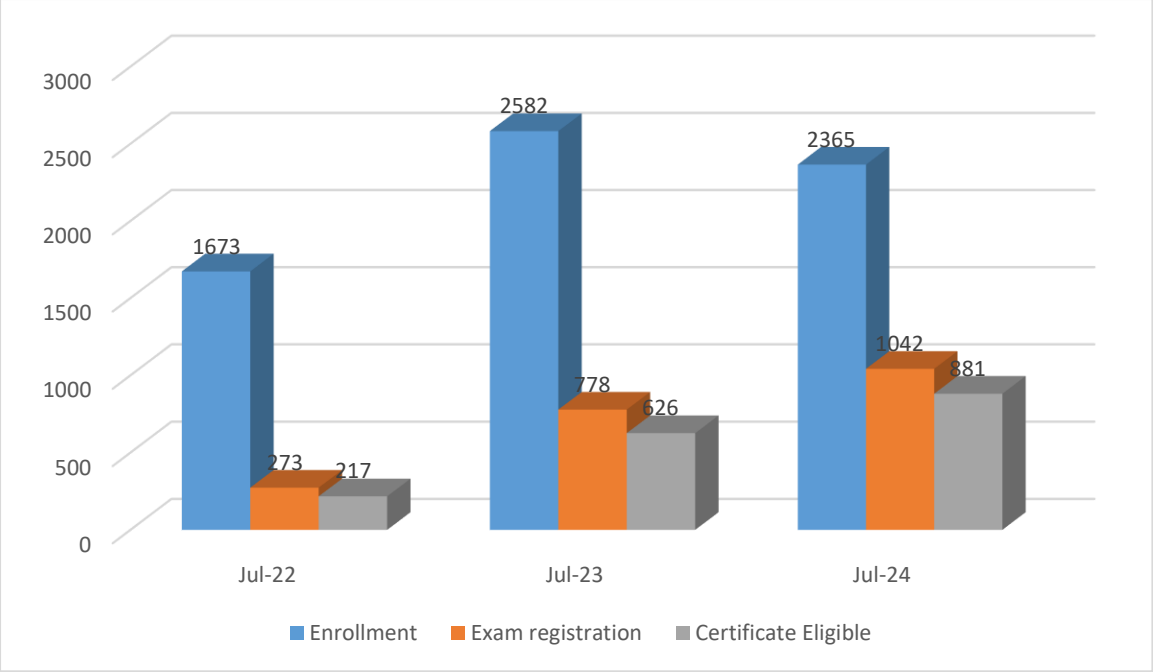
Prof. Shrikrishna N. Joshi
Mechanical Engineering

Type of the course: New Run, July 2022 run Duration: 8 weeks

Course Outline:

This is a basic course on applications of laser technology in manufacturing. The subject laser technology has a very wide range of applications in the product development, manufacturing, surface engineering, and instrumentation. The course emphasizes the fundamental concepts of the laser technology viz. principle of working, characteristics, types, monitoring and control. There is a comprehensive coverage of physical concepts, process characteristics, mathematical formulations along with examples of various laser-based manufacturing processes such as of laser machining (cutting), laser forming, laser welding, laser surface treatment and laser based additive manufacturing. There is a state-of-the-art description of newer and advanced applications of the lasers in industry. This course will be very useful to the students, practicing engineers and researchers. After completion of the course, the students will have a strong foundation on laser technology and will be able to apply the basic principles, process characteristics in the practical scenarios.

Timeline	Type	Enrolled	Registered	Certified
Jul-Dec 2022	New	1673	273	217
Jul-Oct 2023	Rerun	2582	778	626
Aug-Oct 2024	Rerun	2365	1042	881



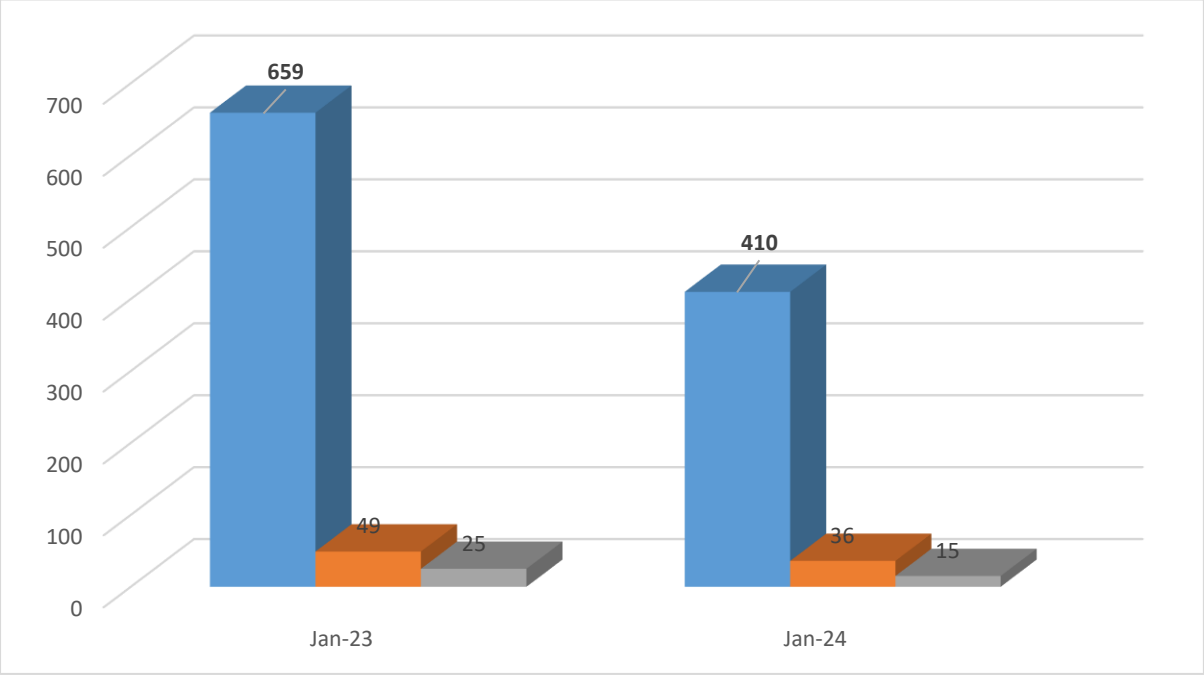
Prof. Bidisha Som
Humanities and Social Sciences

Type of the course: New, Jan 2023 run Duration: 8 weeks

Course Outline:

The course offers a comprehensive take on the phenomenon of Bilingualism. Bilingualism is a seemingly simple fact of todayâ€™s world, but this practice has implications beyond the realm of just communicative needs. Starting from how a society becomes and remains bilingual, the important aspects of a bilingual society, how this impacts many things like social attitude to business strategies and so on to a completely different world of the mind and brain of a bilingual: a wide range of interesting factors make it worthwhile to delve deeper. In order to bring out the various facets of this practice, the course will bring together linguistic, socio-pragmatic, psychological, applied and cognitive significance of this phenomenon. The students will learn about how linguistic and cognitive mechanisms interact in a bilingual mind and how these interactions shape the way the bilingual person processes information at various levels. Also included will be discussion on the topic of effects of bilingualism on general cognitive abilities of a person, be it children or the elderly. Thus, starting with the social factors responsible for bilingualism to the bilingual individualâ€™s language processing and how all this impacts our life at a broader scale, all these topics will be covered in this course.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	659	49	25
Jan-Mar 2024	Repeat	410	36	15



Chemical Process Technology

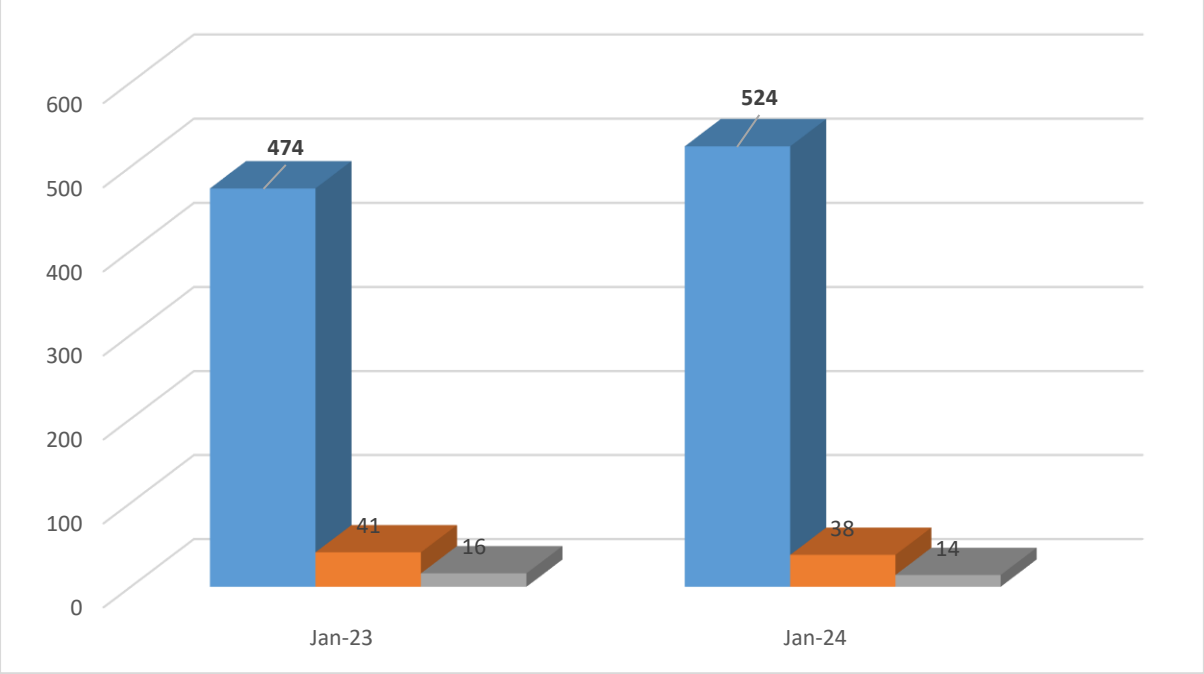
Prof. Tamal Banerjee
Chemical Engineering

Type of the course: New, Jan 2023 run Duration: 12 weeks

Course Outline:

The course shall bring out concepts forming the basis of the Chemical Process Industry and to give a solid background for innovative process development. It shall discuss the actual industrial processes that presents opportunities and challenges for chemical engineers for the development of these processes. Some of these processes still exhibit open challenges. Our goal is to help students and in developing a vision on chemical processes taking into account the microscale ((bio)chemistry, physics), the mesoscale (reactor, separation units), and the macroscale (the process) domains. Hence the knowledge of these will be helpful for outgoing undergraduates for employment opportunities.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	474	41	16
Jan-Apr 2024	Repeat	524	38	14



Enzyme Sciences and Technology

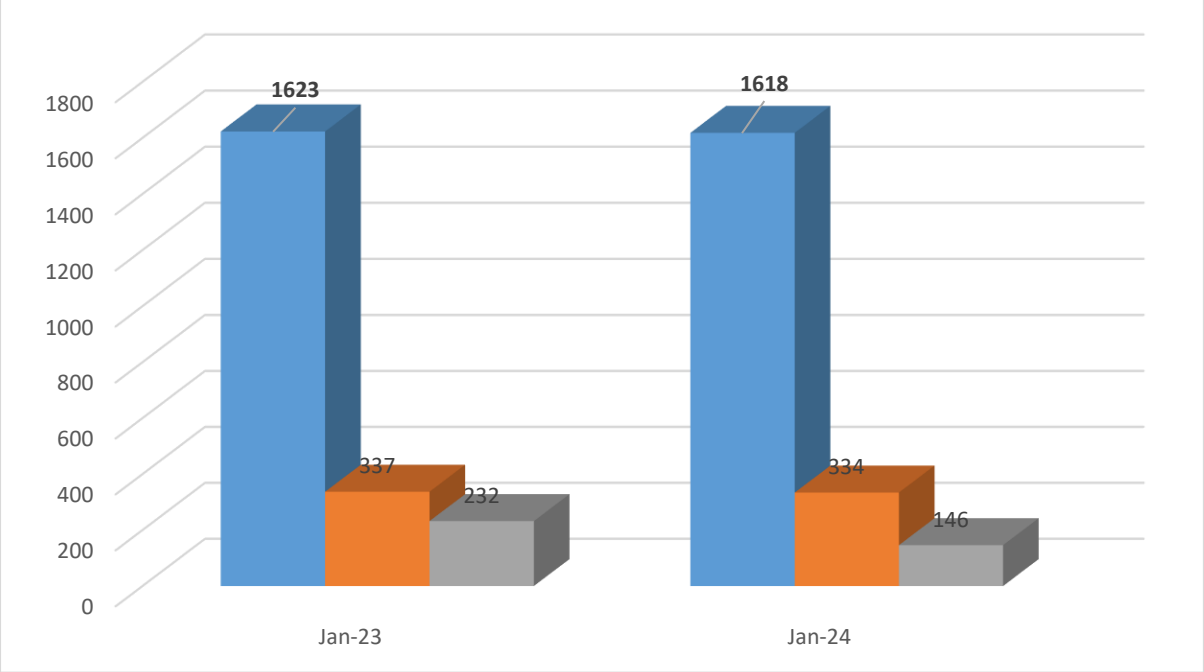
Prof. Vishal Trivedi
Biosciences and Bioengineering

Type of the course: New, Jan 2023 run Duration: 12 weeks

Course Outline:

In the current MOOCs course, I have put effort to discuss different aspects of enzymology for engineer graduate students as well as MSc students. Enzyme play pivotal role in running different types of metabolic reactions, converting toxic substances into non-toxic products and they are essential for running several physiological processes. 1. Basics understanding of enzyme structure and functions, its production through different types strategies, purification etc. 2. Understanding different approaches to study the interaction of substrate with enzymes, enzyme assay and kinetics. 3. Broad over-view of different approaches to design inhibitors against enzyme, understanding the enzyme-inhibitor kinetics and mode inhibition. 4. Role of enzyme in cell metabolism, physiology and application of enzymes.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	1623	337	232
Jan-Apr 2024	Rerun	1618	334	146



Inorganic Chemical Technology

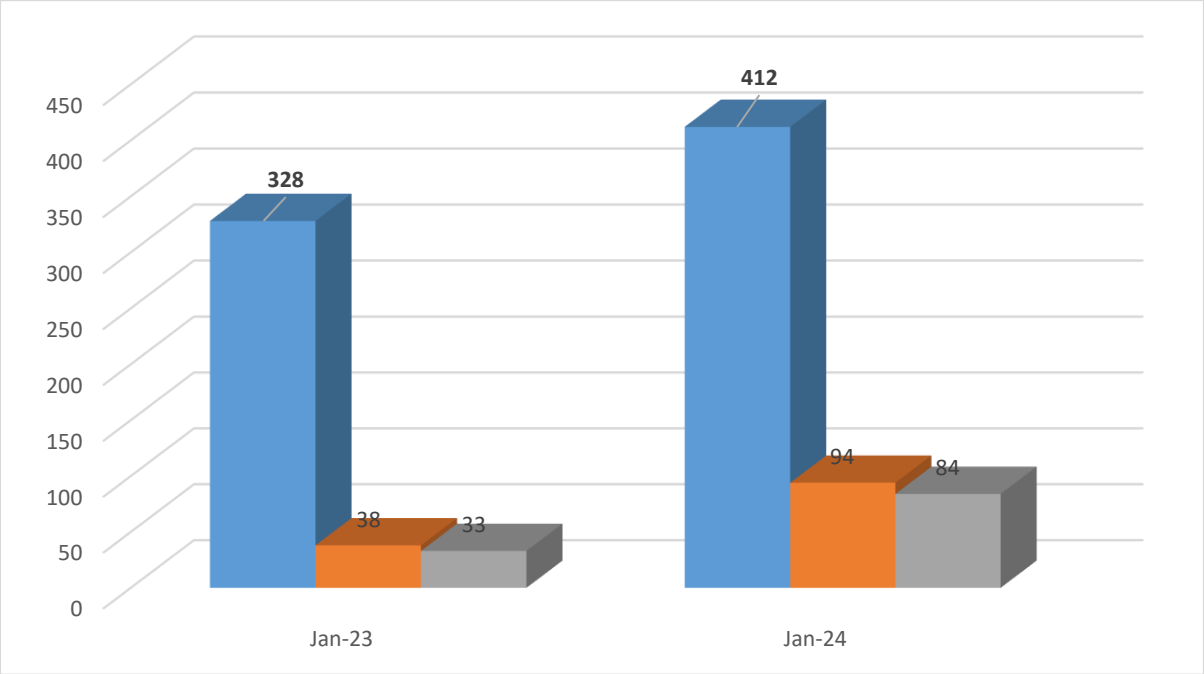
Prof. Nanda Kishore
Chemical Engineering

Type of the course: New, Jan 2023 run Duration: 12 weeks

Course Outline:

This course is primarily on manufacturing processes of various inorganic chemicals at the industry level. For production of a variety of inorganic chemicals, the basic raw materials requirement, different processes available for the production, flowsheets for such processes, engineering problems associated with such production processes and economics of the processes/materials produced will be discussed. Prior to discussing the production of inorganic chemicals, details of Indian industry along with their current production status and possible improvements discussed in the course. In addition, at the beginning of the course, the discussion of various unit operations and unit processes that form a complete chemical plant, presented in the course.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	328	38	33
Jan-Apr 2024	Repeat	412	94	84



Thermal Engineering: Basic and Applied

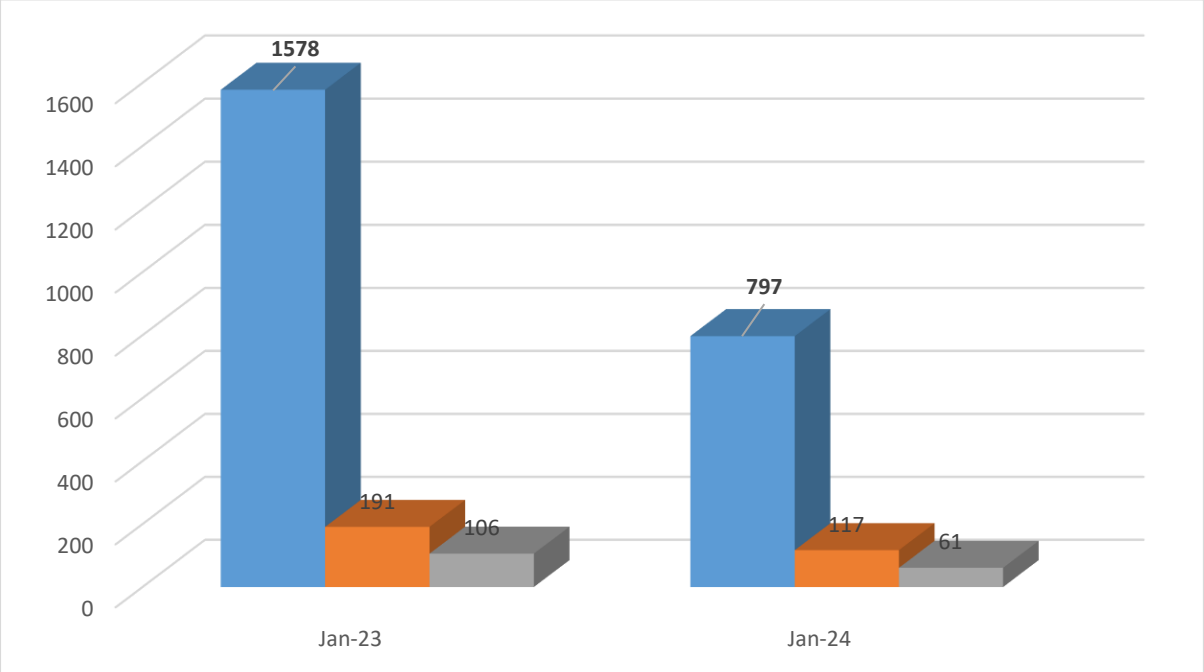
Prof. Pranab K. Mondal
Mechanical Engineering

Type of the course: New, Jan 2023 run Duration: 12 weeks

Course Outline:

This course deals with the Applied Thermal. This course focuses on different aspects of applied thermodynamics, which include fundamental analysis of steam power plant starting from thermodynamics to its application in different processes, analysis of the Internal combustion engines, Gas turbine cycles, and the Refrigeration cycle. Thus, this course would provide an understanding on several aspects of thermal engineering from the basics to applied parts and would unveil several physical issues concerning with the fundamental analysis and operational principle.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	1578	191	106
Jan-Apr 2024	Rerun	797	117	61



Vibration of Continuous Systems

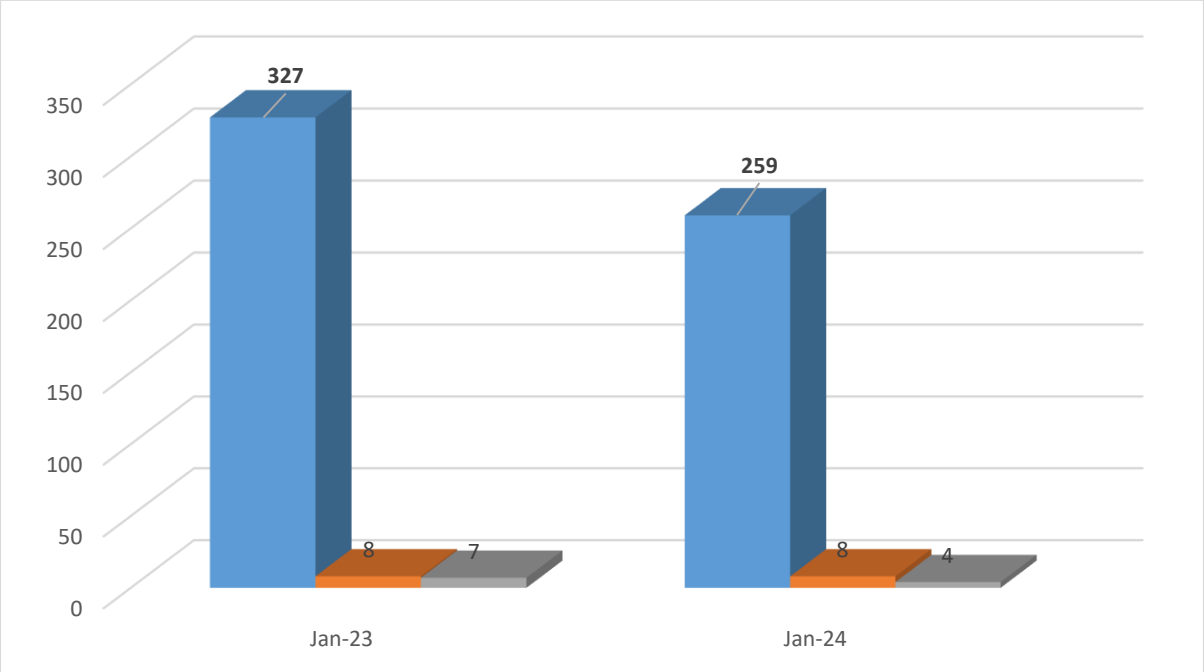
Prof. Sudip Talukdar
Civil Engineering

Type of the course: New, Jan 2023 run Duration: 12 weeks

Course Outline:

All structures or mechanical systems are in fact, continuous having their physical parameters, external forces and their response are distributed in space. The dynamic behavior of the structures or machine components, can only be truly reflected in the continuous systems. The slenderness of the structures necessitates the adoption of continuous modelling. The exact solutions that can be obtained from continuous models provide true physical behavior in addition to yielding various bench mark results for testing the efficacy of many numerical methods used in discrete approaches. Keeping this in mind, the present course has been framed to teach the students about the formulation and solution of vibration problems of the continuous systems by exact method as well as by numerical techniques with application of MATLAB tool box. The course is designed for 12 modules in which each module will consist of 3 or 4 lecture hours.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2023	New	327	8	7
Jan-Apr 2024	Repeat	259	8	4



Reliability-Based Structural Design

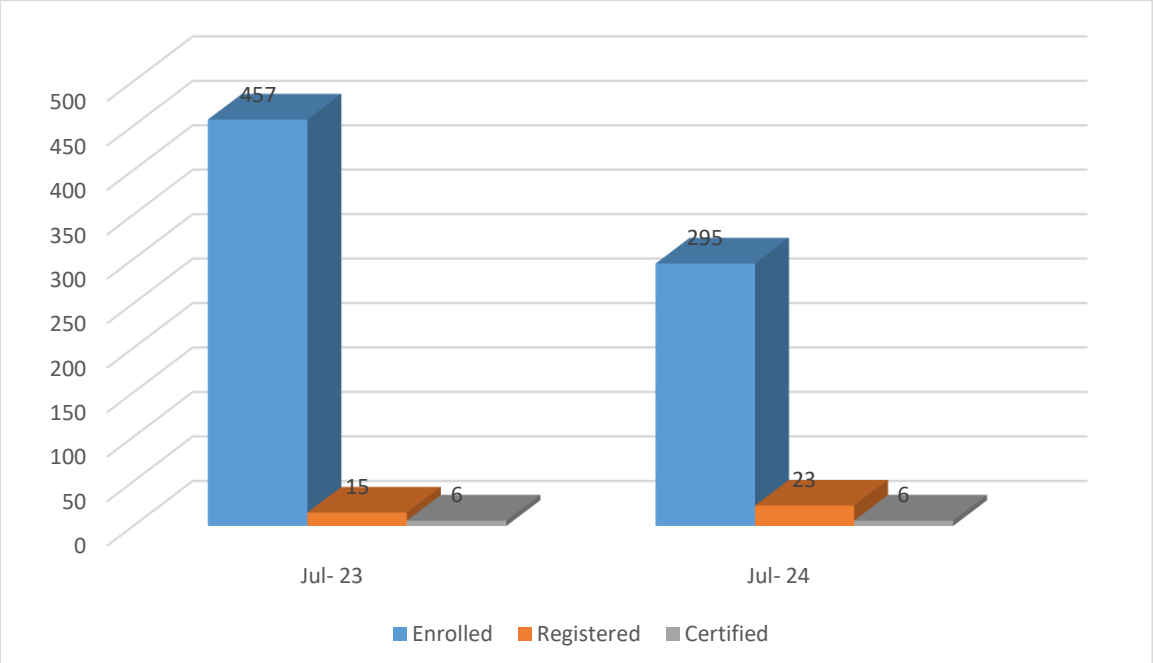
Prof. Arunasis Chakarborty
Civil Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

The course introduces basic concepts of probability theory at the beginning, which is followed by the Level-2 reliability methods. The readers are then introduced to the intricacies of Monte-Carlo simulation and its advanced versions for variance reduction and subset simulation. The treatment of implicit limit states using RSM and recently developed SRSM techniques are explained separately with examples. With this knowledge of reliability analysis in hand, the course then aims to explain the applications of these methods for code calibrations and reliability analysis under multiple failure modes.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	457	15	6
Jul-Oct 2024	Repeat	295	23	6



Organic Chemical Technology

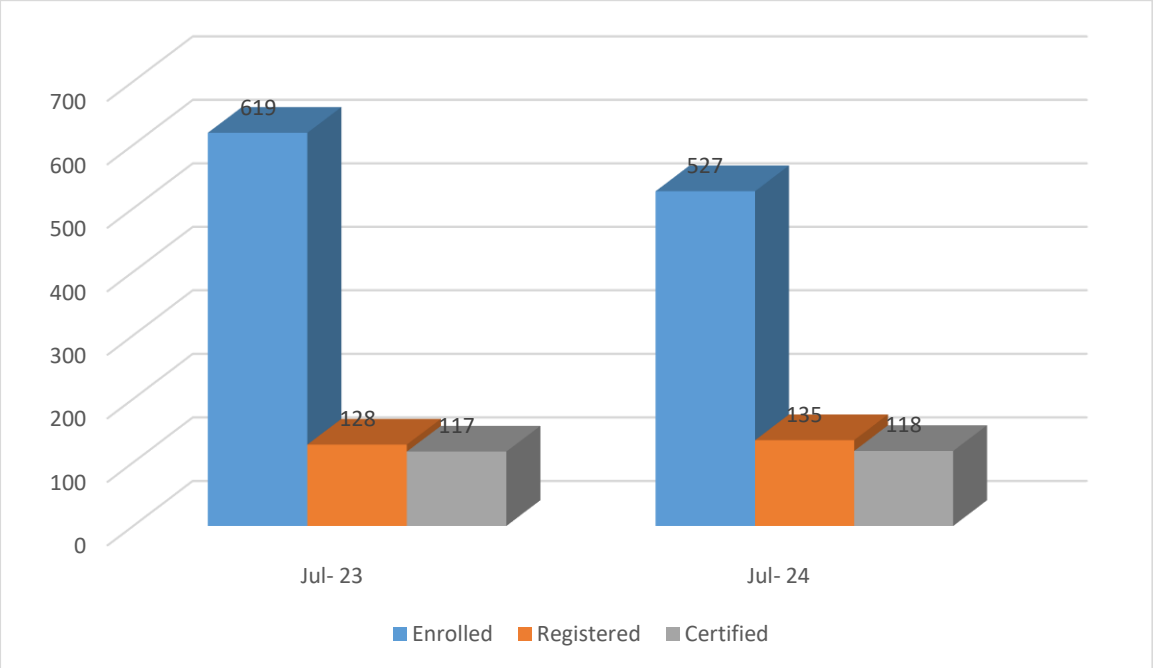
Prof. Nanda Kishore
Chemical Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

Organic chemical industry may be crudely grouped as natural and synthetic chemical industry. Natural product industries may include production of edible and essential oils, soaps and detergents, paints and varnishes, sugar and starch, pulp and paper, etc. while the synthetic chemical industries may include production of petrochemicals, polymers, etc. Thus, this course would present manufacturing processes of various natural and synthetic organic chemicals along with required raw materials, process chemical reactions, process flow charts, major engineering problems and economics of each individual organic chemical.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	619	128	117
Jul-Oct 2024	Rerun	527	135	118



Solid-Fluid Operations

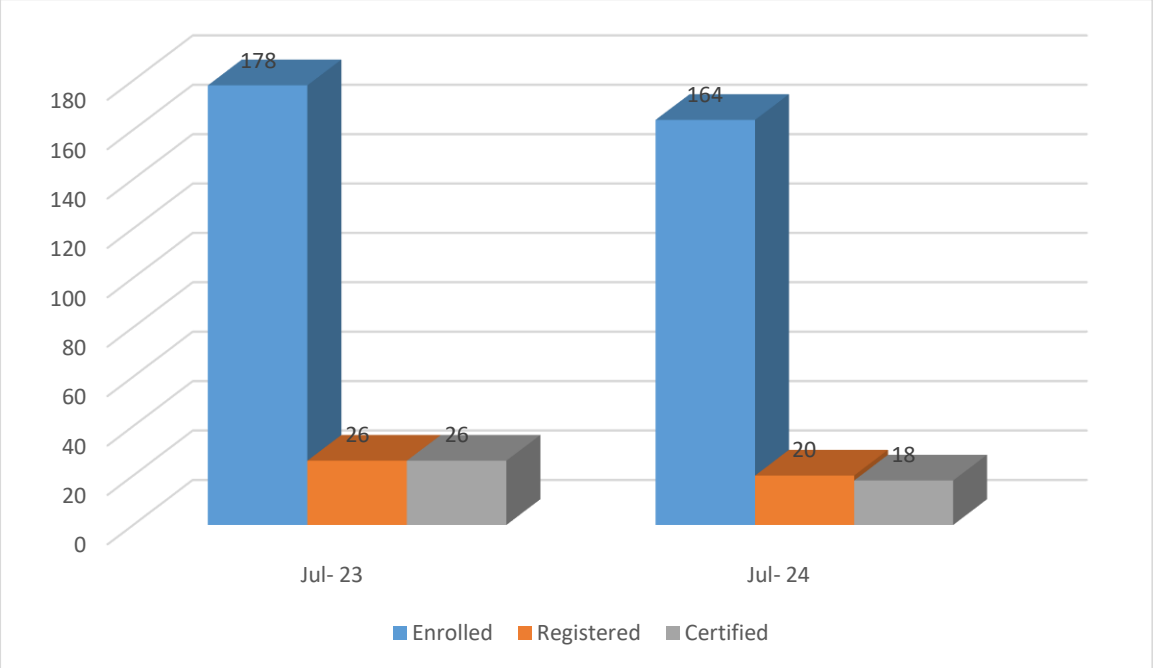
Prof. Subrata Kumar Majumder
Chemical Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

Solid-Fluid Operations is a term used to refer to the science and technology related to the handling and processing of particles and powders is presence and absence of fluid. Particle technology is also often described as powder technology, particle science and powder science. Powders and particles are commonly referred to as bulk solids, particulate solids and granular solids. The objective of this course is to introduce the subject of particle technology to students studying degree courses in disciplines requiring knowledge of the processing and handling of particles and powders. Although the primary target readership is amongst students of chemical engineering, the material included should form the basis of courses on particle technology for students studying other disciplines including mechanical engineering, civil engineering, applied chemistry, pharmaceutics, metallurgy and minerals engineering.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	178	26	26
Jul-Oct 2024	Repeat	164	20	18



Energy Conversion Technologies (Biomass and Coal)

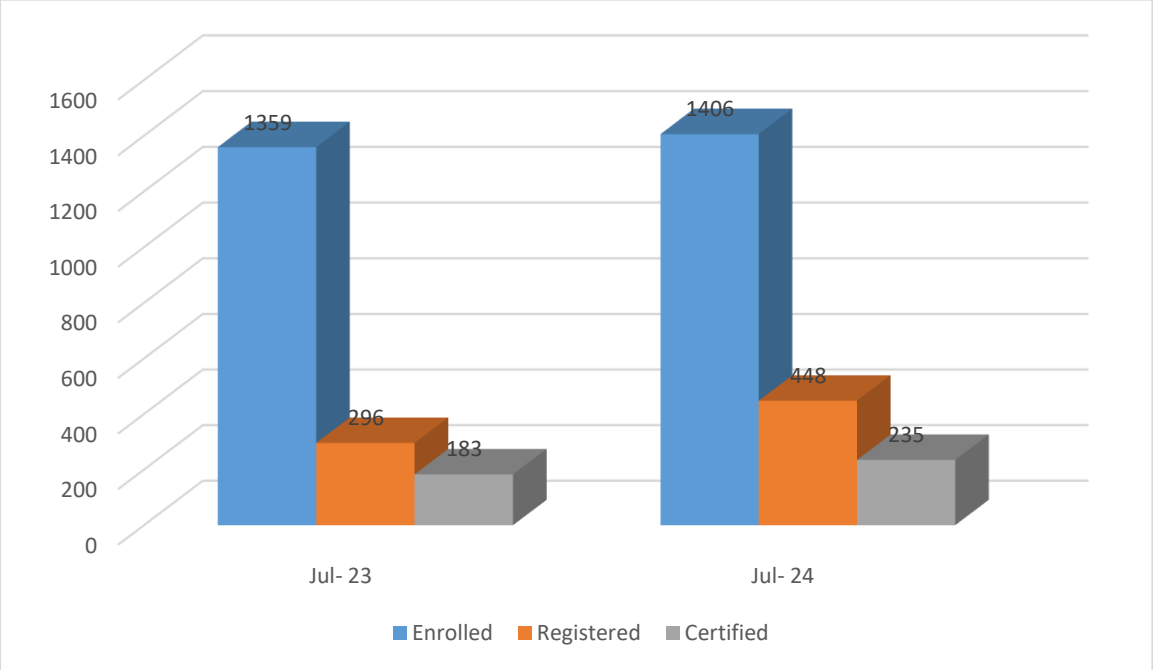
Prof. Vaibhav V. Goud
Chemical Engineering

Type of the course: New, July 2023 run Duration: 8 weeks

Course Outline:

Energy conversion technology is concerned with the transformations of energy from forms provided by nature to convenient or useful forms of energy. Harnessing the energy through these sources using efficient technologies is expected to play an important role in serving as clean energy source for mankind. This course covers fundamentals of such energy conversion systems with a broad perspective that encompasses technical and environmental aspects. The topic covers analysis of energy conversion in thermochemical, biochemical, and chemical processes using range of traditional and alternative energy sources and presents assessments of their availability, sustainability, and evaluation of their potential role in solving the global energy crisis. This course aims at providing the recent advancement and technological developments (carbonization, torrefaction, sub and supercritical water gasification, thermochemical conversion to ethanol, green diesel) in the field of conventional (coal) and non-conventional energy sources (biomass) with emphasis on engineering and design aspects and concept of integration of energy system. This course has been especially prepared for researchers, academician, professionals from industries and students to learn the important aspects of environmentally friendly energy conversion technologies to produce fuels and chemicals.

Timeline	Type	Enrolled	Registered	Certified
Jul-Sep 2023	New	1359	296	183
Jul-Sep 2024	Rerun	1406	448	235



Petroleum Reservoir Engineering

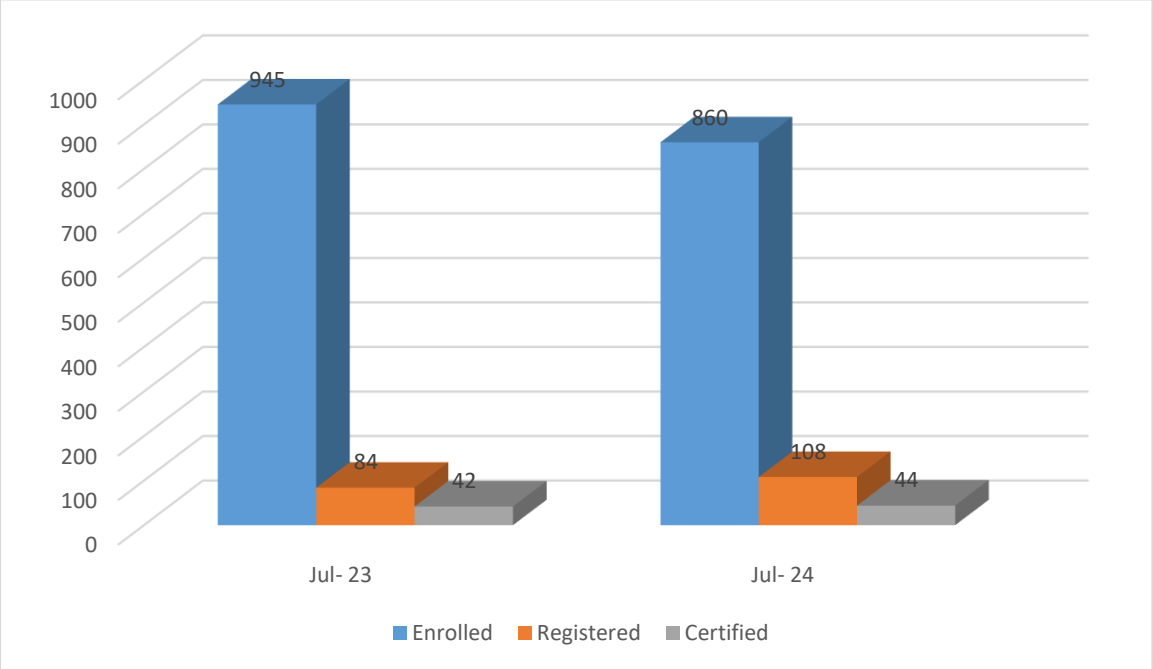
Prof. Pankaj Tiwari
Chemical Engineering

Type of the course: New, July 2023 run Duration: 8 weeks

Course Outline:

The fundamental concepts of the Petroleum Reservoir Engineering are very much important for petroleum production and the allied engineering for safe and efficient operation of petroleum reservoirs. The course provides a broad outline with respects to both the basic and advanced topics in the field of reservoir engineering including enhanced oil recovery, reservoir simulation tools and unconventional production of natural gas.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	945	84	42
Aug-Oct 2024	Rerun	860	108	44



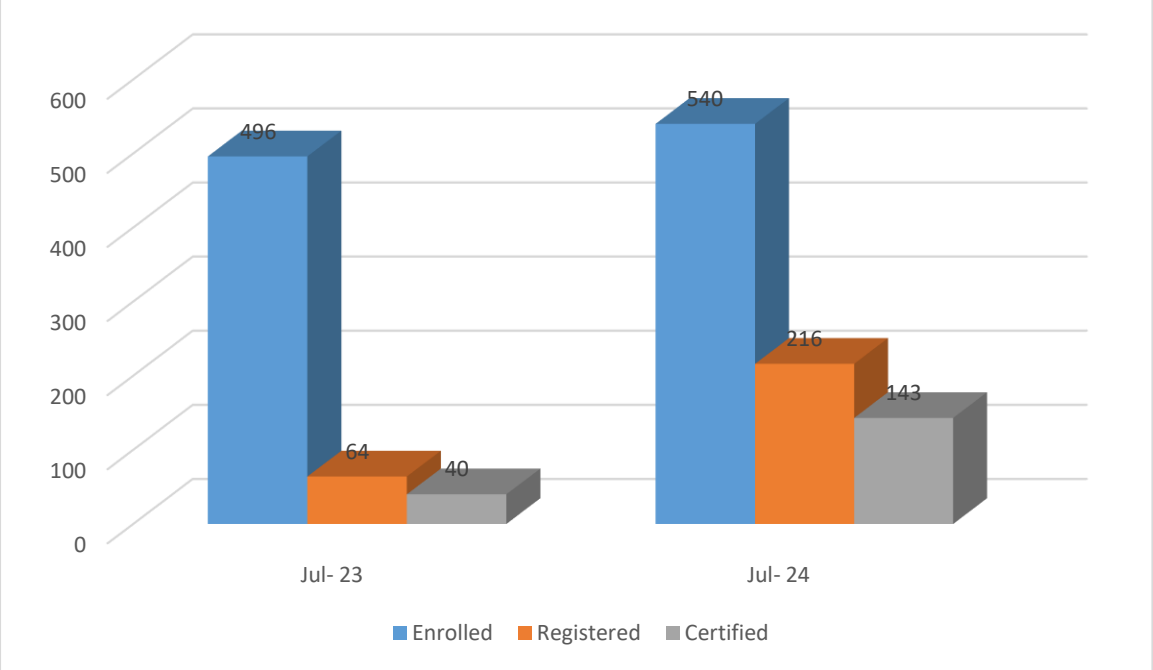
Prof. Urmi R. Salve
Design Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

This course will help the students to understand the critical issues faced during any field data collection, data analysis and interpretation. It will give an understanding about building the phases of ergonomics research through practical exposure. Also, in this course, few case studies will be discussed which will help the students to understand â€œbasic steps to be followedâ€ for ergonomics research. Instrument handling, human data collection which is inevitable part of ergonomics research will be taught in this course thoroughly.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	496	64	40
Jul-Oct 2024	Rerun	540	216	143



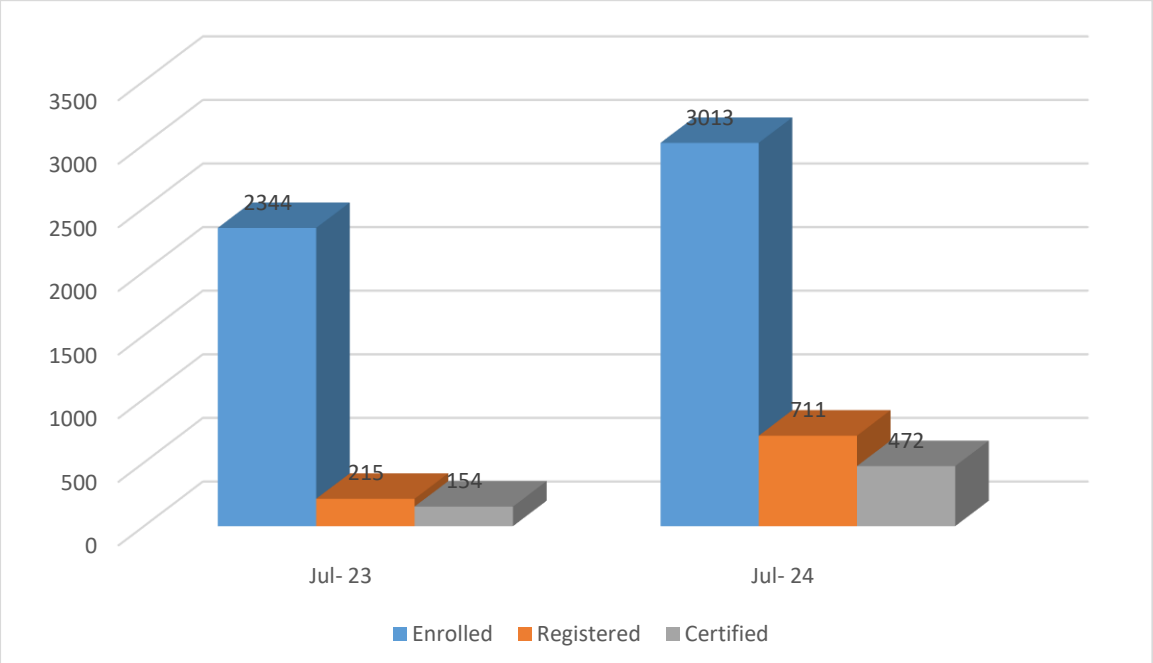
Prof. Ribhu
Electronics and Electrical Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

This is course is meant to introduce students to the idea of modelling and simulation of communication systems exhibiting while highlighting the underlying stochastic behavior of these systems. The key objectives of this course are twofold: To introduce the importance of Monte Carlo methods for analyzing the behavior of communication systems. To encourage students to model and analyze stochastic systems around them. By the end of this course, the students will be able to confidently program in MATLAB and develop programming models for simulating communication systems.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	2344	215	154
Jul-Oct 2024	Rerun	3013	711	472



Nanophotonics, Plasmonics, And Metamaterials

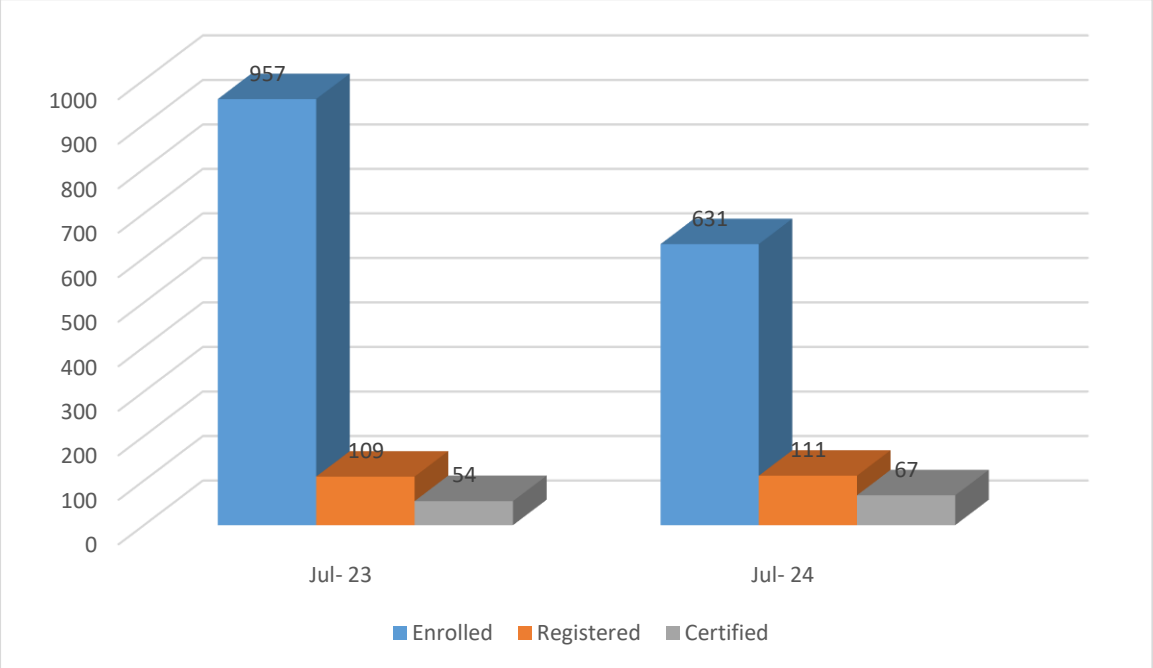
Prof. Debabrata Sikdar
Electronics and Electrical Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

The course provides a detailed introduction to the three cornerstones of the future photonic technologies, viz., nanophotonics, plasmonics, and metamaterials, covering their fundamentals and latest advancements. The basics and applied aspects of nanophotonics i.e. controlling, guiding, and manipulating electromagnetic radiation at the nanoscale will be discussed. The course will first cover the principles of photonic crystals, metal optics, surface plasmon resonance and their applications. Later on, the course will focus on metamaterials and metasurfaces, covering their fundamentals and various applications such as tunable devices, absorbers, hyper lens, super lens, beam steering, and in cloaking and transformation optics. The course will also introduce new alternative materials for nanophotonics and summarize different techniques for fabrication of these nanophotonic devices.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	957	109	54
Jul-Oct 2024	Rerun	631	111	67



Machine Learning and Deep Learning -- Fundamentals and Applications

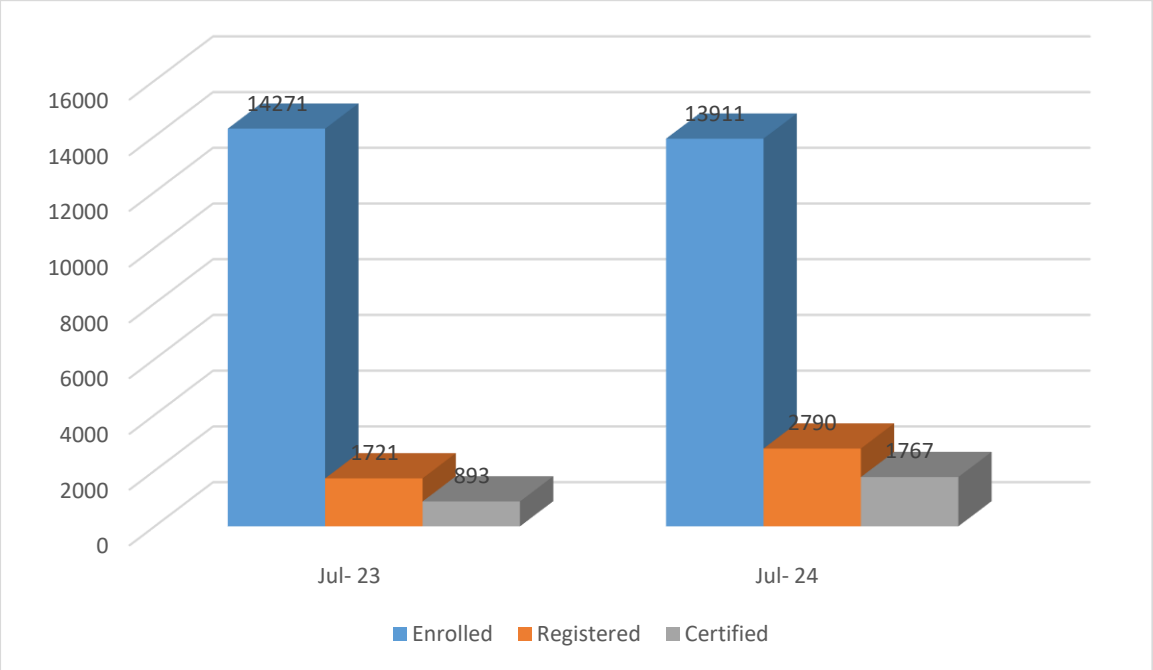
Prof. M.K. Bhuyan
Electronics and Electrical Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

In this course we will start with traditional Machine Learning approaches, e.g. Bayesian Classification, Multilayer Perceptron etc. and then move to modern Deep Learning architectures like Convolutional Neural Networks, Autoencoders etc. We will learn about the building blocks used in these Deep Learning based solutions. Specifically, we will learn about feedforward neural networks, convolutional neural networks, recurrent neural networks and attention mechanisms. On completion of the course students will acquire the knowledge of applying Machine and Deep Learning techniques to solve various real-life problems.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	14271	1721	893
Jul-Oct 2024	Rerun	13911	2790	1767



Sustainable Power Generation Systems

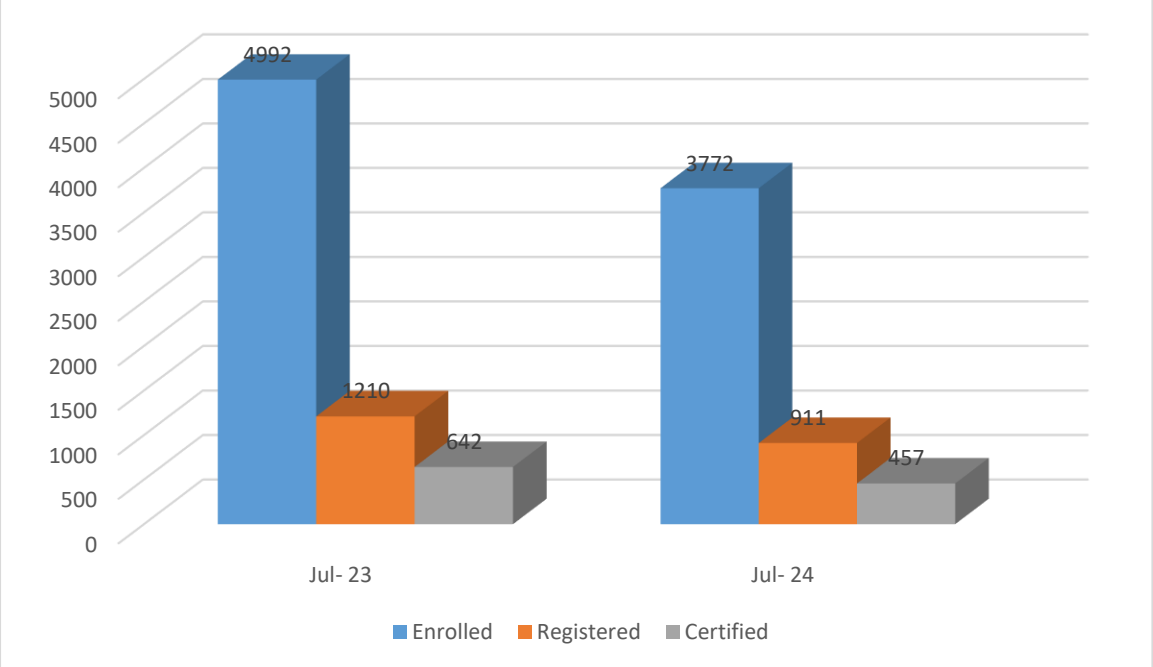
Prof. Pankaj Kalita
School of Energy Science and Engineering

Type of the course: New, July 2023 run Duration: 12 weeks

Course Outline:

The course content is designed to provide comprehensive knowledge of various renewable energy systems. Specifically, in this course, the design and analysis of renewable energy power plants will be discussed. The concepts will be illustrated with practical examples, schematics and block diagrams wherever required. A sufficient number of numerical problems with solutions will be discussed in the course. This course is specifically designed for undergraduate and postgraduate students of Energy Engineering and Technology. Further, the course will be very much useful for students and researchers from varied academic backgrounds for the synthesis of novel energy conversion devices and processes.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	4992	1210	642
Jul-Oct 2024	Rerun	3772	911	457



Quantum Hall Effects

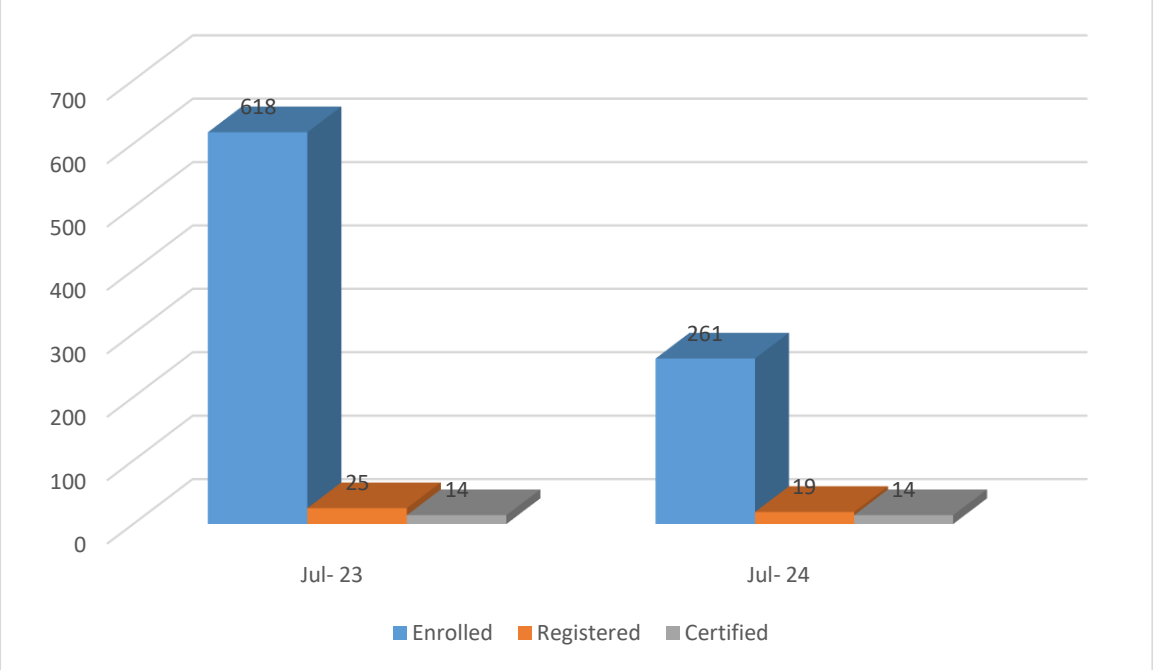
Prof. Saurabh Basu
Physics

Type of the course: New, July 2023 run Duration: 8 weeks

Course Outline:

Quantum Hall effect is undoubtedly the greatest discovery in material science in the last century. The quantized Hall plateaus shows the occurrence of quantum effects at macroscopic scales and sets the standard of resistance from a lab experiment on a dirty two-dimensional electron gas. The Hall effect is used in magnetic field sensors that are present in a large number of devices. It has already earned 3 noble prizes, one each of Integer Qauntum Hall effect (1985) , Fractional Quantum Hall effect (1998) and its connections with topology (2016). The course will introduce from the scratch the behavior of electrons at low temperatures and large magnetic fields, formation of Landau levels, Quantization of Hall plateaus from a physical perspective and hence derive Kubo formula. The connections with topology are shown via computing the Chern number. Moreover, the fractional quantum Hall effect is introduced with a brief description of fractional statistics and Anyons. Finally, the course introduces Spin Hall effect and its relevance to the field of spintronics.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2023	New	618	25	14
Jul-Sep 2024	Repeat	261	19	14



Applied Seismology for Engineers

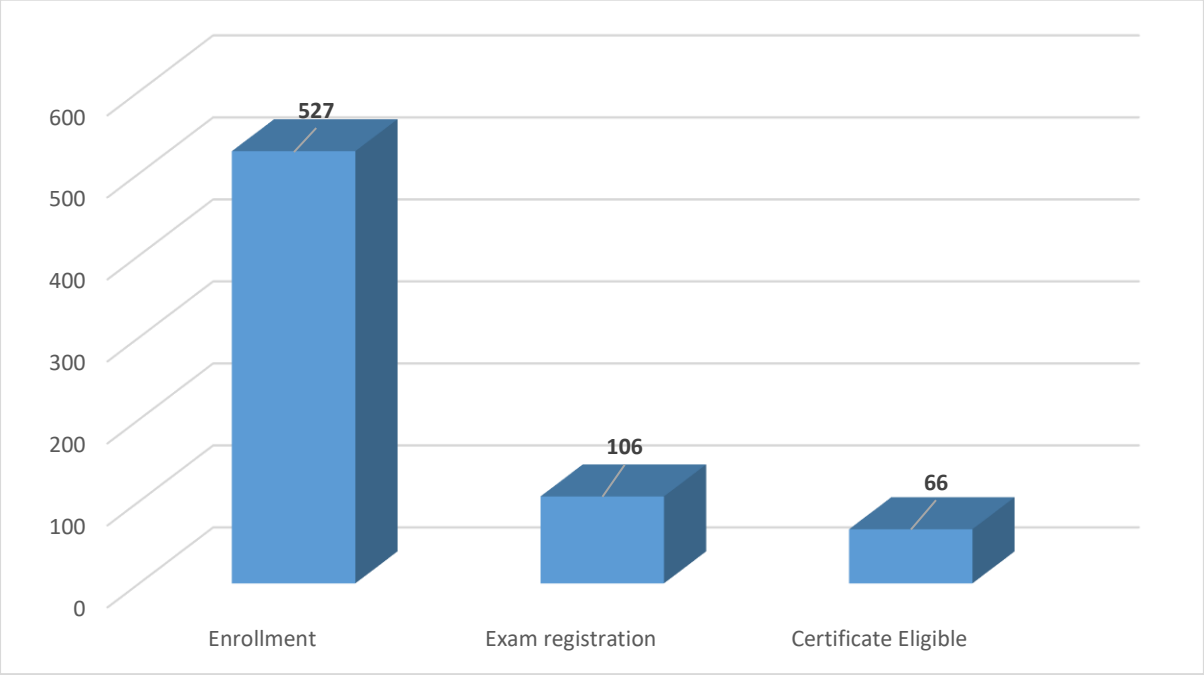
Prof. Abhishek Kumar
Civil Engineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

The present course gives an overview followed by in-depth knowledge about various topics which are required particularly for seismic analysis whether related to determination of seismic loading, understanding dominating fault mechanism in the region, understanding slope stability problems, development of synthetic ground motions, seismic hazard analysis, source characterization, ground response analysis etc. It will help reader to gain deep understanding about above subjects and how these are applied to real life problems. Theoretical explanation followed by numerical problems on above mentioned topics will be covered.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	527	106	66



Applied Statistical Thermodynamics

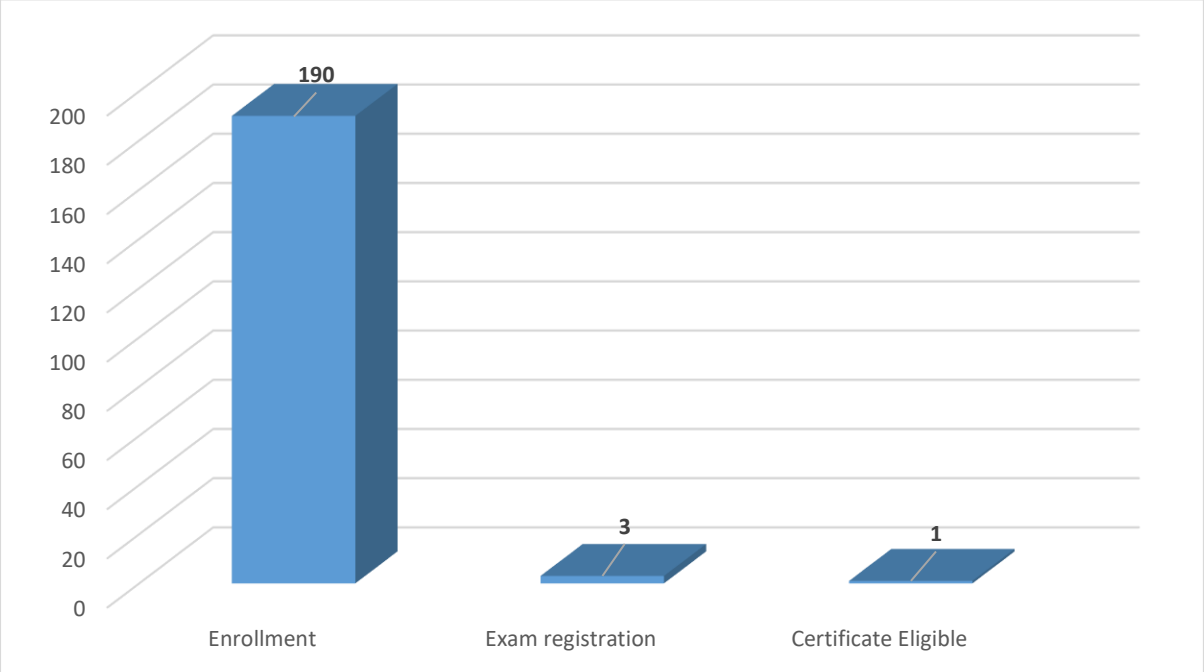
Prof. Tamal Banerjee
Chemical Engineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

With the current emphasis on nano- and biotechnologies, descriptions at the molecular level can be used to create effective predictions in chemical engineering and physical chemistry. Classical thermodynamics can be used to relate heat and work and to describe various processes, including phase behaviour, chemical reaction equilibria, and flows on changes of state, but it hardly acknowledges the existence of molecules. This information can also be obtained by statistical thermodynamics, which begins with a description of individual molecules. Molecular-level description and statistical thermodynamics helps us to gain useful insights. In this course, only equilibrium properties, not dynamic or kinetic properties such as the kinetic theory of gases or liquids, are examined; thus, the term statistical thermodynamics is used rather than the more comprehensive statistical mechanics.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	190	3	1



Digital Design with Verilog

Prof. Chandan Karfa, Prof. Aryabartta Sahu
Computer Science and Engineering

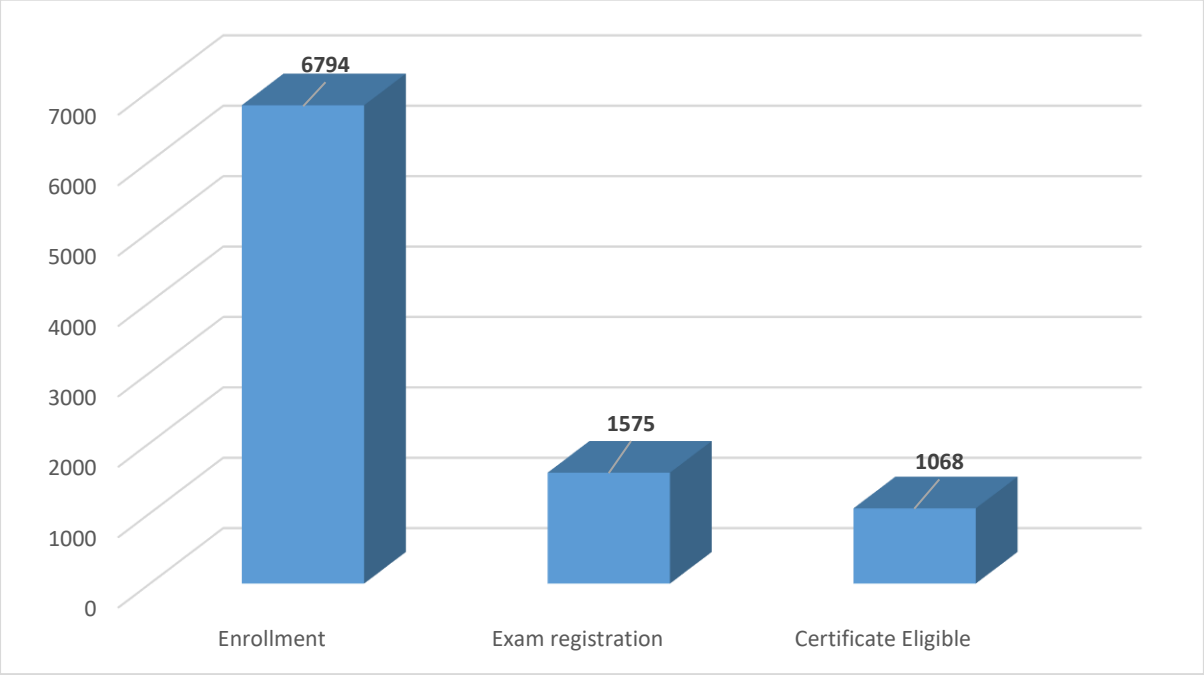
Type of the course: New, Jan 2024 run

Duration: 12 weeks

Course Outline:

Digital Design is a fundamental course for developing large VLSI designs. This course helps student to understand the internal logic of various combinational units that is needed to develop large VLSI design. The course also introduces the sequential components, clocks and concepts of register transfer level design development process. In this course, we not only introduce the core concepts of digital design, we also introduce hardware description language Verilog. In each module, we will discuss how to implement all fundamental blocks in Verilog. Therefore, this course will help students to understand the internal details of fundamental blocks of digital circuits and also their implementation details.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	6794	1575	1068



Prof. Shaik Rafi Ahamed
Electronics and Electrical Engineering

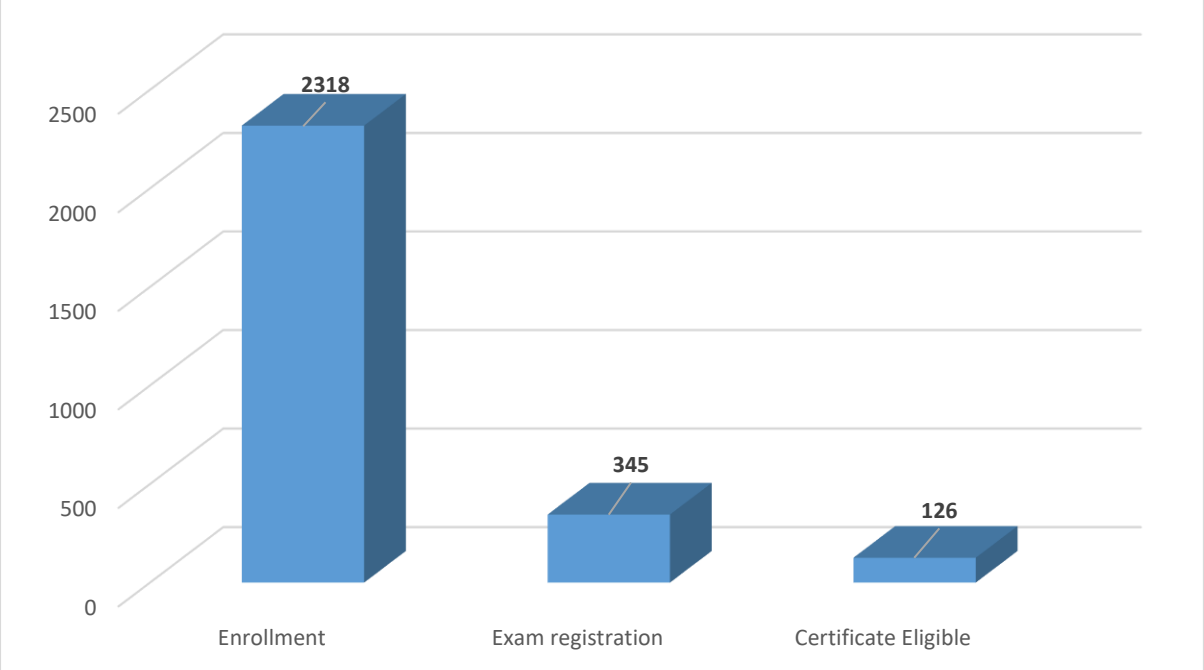
Type of the course: New, Jan 2024 run

Duration: 12 weeks

Course Outline:

The objective of this course is to impart thorough understanding of operational amplifiers. After completing this course, the participants would be able to design and implement various signal conditioning operations involved in instrumentation, signal processing and communication systems.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	2318	345	126



Introduction to Solidification Processing

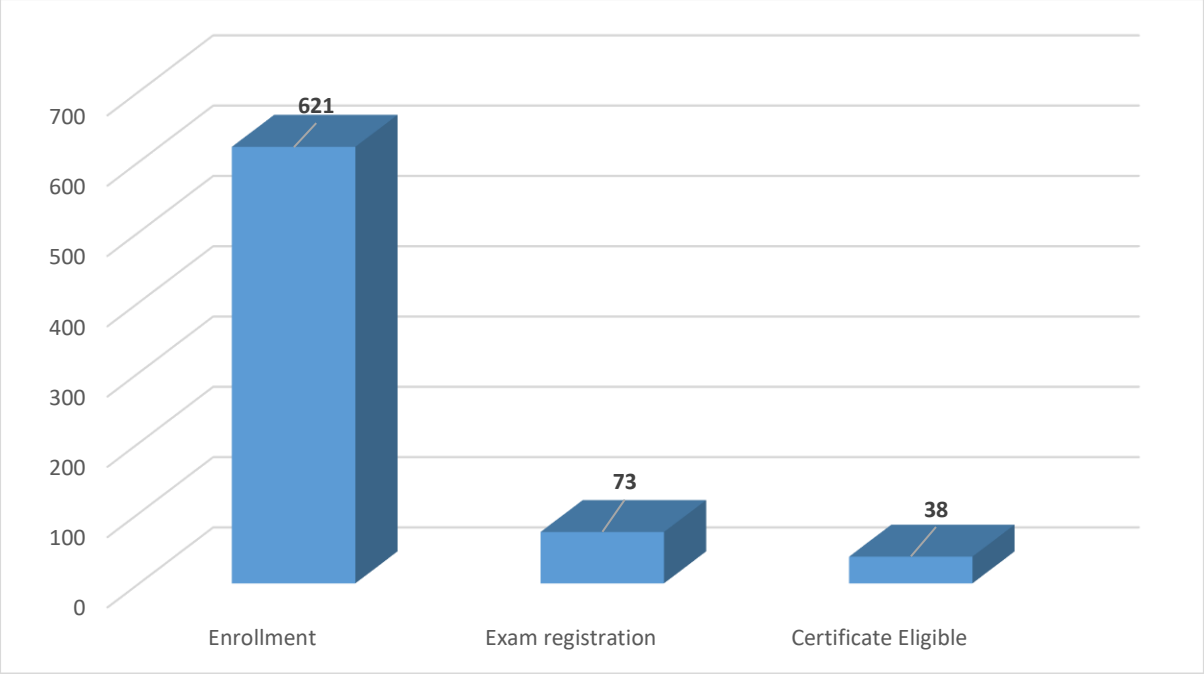
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, Jan 2024 run Duration: 8 weeks

Course Outline:

This course is primarily designed by targeting the students who are interested in fundamental understanding of solidification in broad area of materials and manufacturing processes. The aim of this course is to understand the thermodynamic principles and heat transfer mechanism associated with casting and welding processes. This course emphasizes on to the linking of kinetics and development of microstructure during solidification processing. The syllabus is oriented to cover from basic understanding to practical applications of this technology. Students will be able to develop fundamental understanding on the metallurgical aspect of casting and welding processes through the lectures and will be reinforced through assignments. The modules cover almost all the aspects of solidification processing, and it is blended with fundamental development to the recent technologies such as rapid solidification and solidification in additive manufacturing. This course is presented in a lucid and simplified way to make it enjoyable for the beginners.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	621	73	38



Mechanics of Sheet Metal Forming

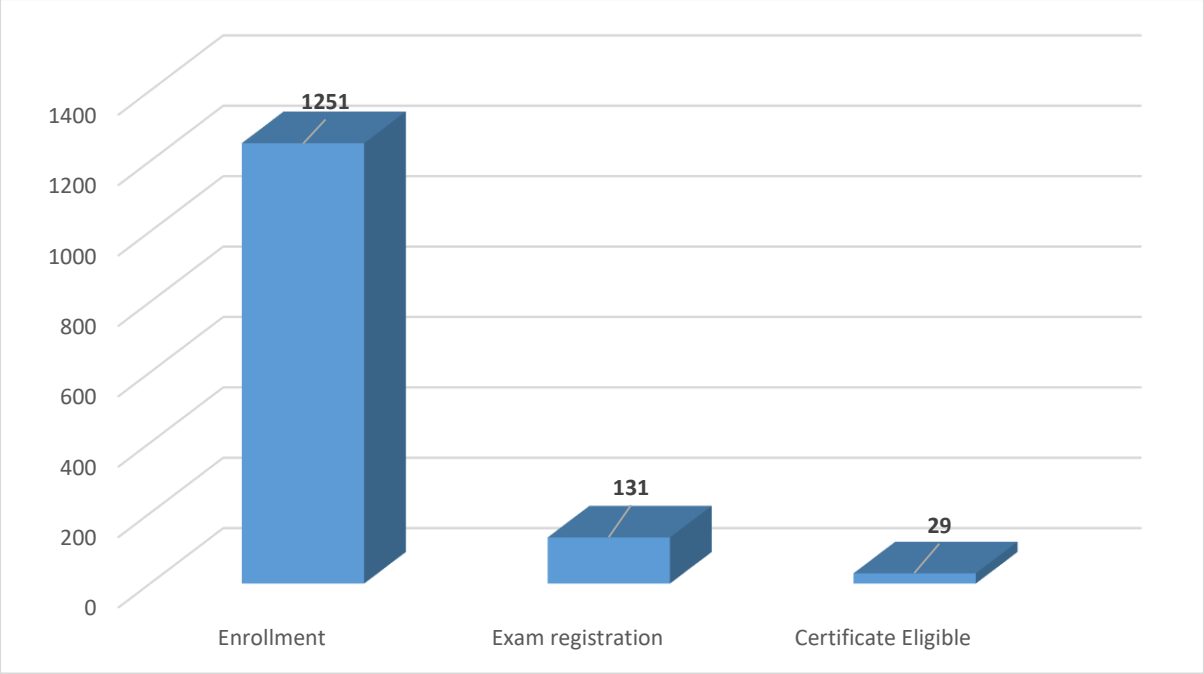
Prof. R Ganesh Narayanan
Mechanical Engineering

Type of the course: New, Jan 2024 run Duration: 8 weeks

Course Outline:

Sheet metal forming processes are useful in manufacturing components in automotive, aerospace, defense and stamping industries. The components are used in automobiles, household items, space equipment, defense equipment, and several others. There is a need to understand the mechanics part of the sheet forming processes such as deep drawing, stretch forming, bending, hydroforming, along with basic plasticity. This course will provide such details through theoretical analyses and numerical problems, along with basic concepts in metal forming. The first part of the course deals with several concepts in metal forming and plasticity, and the second part includes theoretical analyses of few sheet forming and tube forming operations. The course will be useful to design engineers, stamping engineers, manufacturing students and scholars, and academia. Through this course, participants will be able to apply basic concepts for modeling any manufacturing processes involving plastic deformation.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	1251	131	29



Molecular Biology

Prof. Vishal Trivedi
Biosciences and Bioengineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

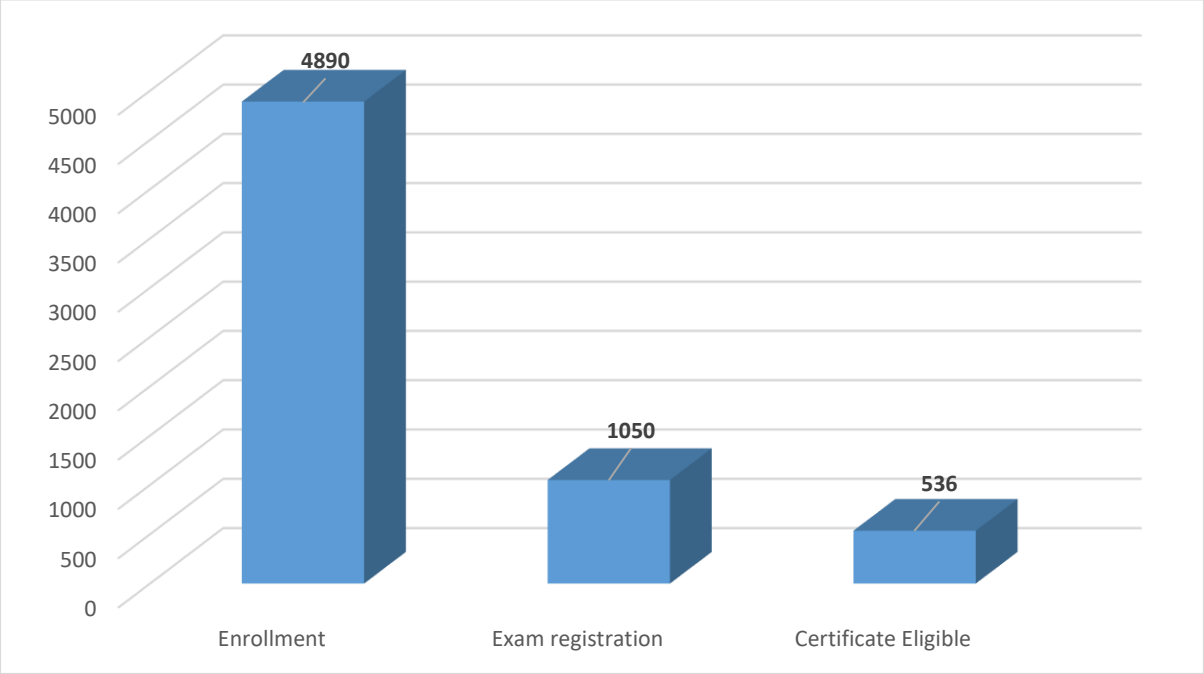
In the current MOOCs course, I have put effort to discuss different aspects of molecular biology for engineer graduate students as well as MTech students. Biological processes are controlled by different types of molecules such as cell signaling, replication, transcription, protein expression and development. Apart from these aspects, molecular biology theory leads to the development of several diagnostic methods and recombinant DNA technology. At the end of the course, student could be able to understand following aspects;

1. Basics understanding of central dogma of molecular biology involving replication, transcription and translation. In addition, we will discuss about structure and function of cells, their manipulation and exploitation using molecular biology tools.

2. Discussion about mutagenesis and repair mechanism. Approaches for Genome Editing and gene silencing.

3. At the end we will discuss the role of molecular biology to develop different types of techniques, cloning and over-expression of foreign protein in expression system.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	4890	1050	536



Organizational Behaviour: Individual Dynamics in Organization

Prof. Abraham Cyril Issac
School of Business

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

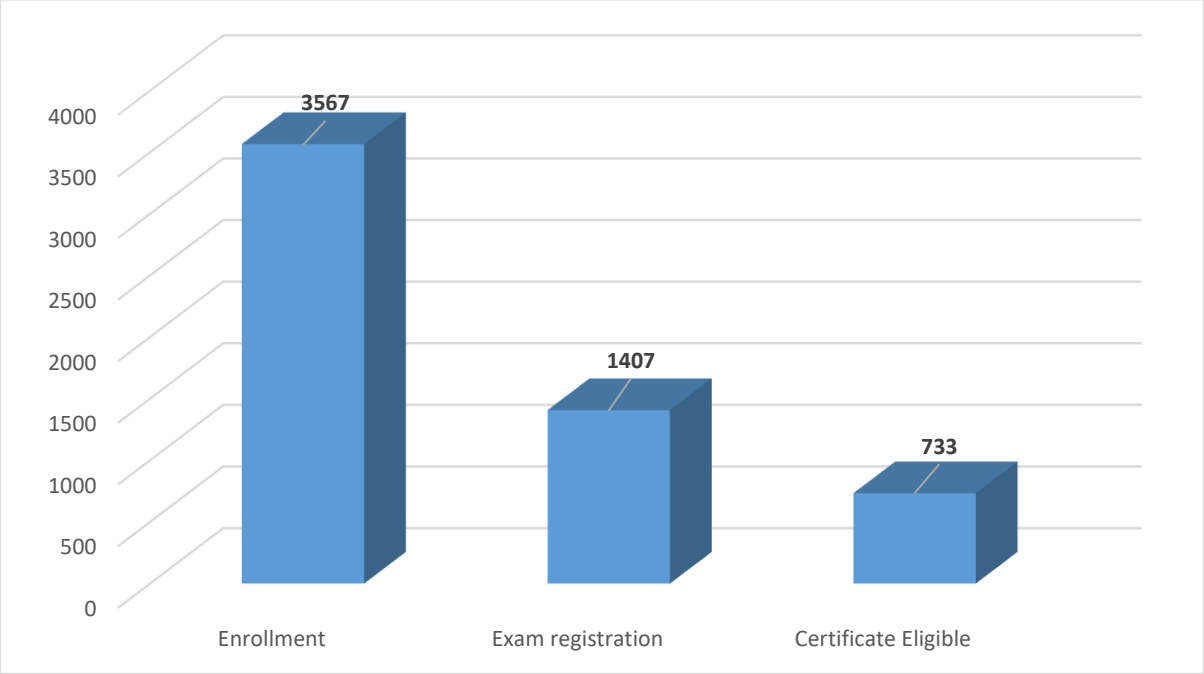
Organizational behaviour is an essential part of management studies as it centers around the activities of individuals nested within the system and interacting amongst themselves and the system to create output. The focus on individual dynamics is the crux of this course which will equip the course takers to understand the theories and applications of behavior in work settings. The course encompasses individual attributes which impact workersâ€™ behavior at their workplace. Individuals are the basic blocks of organizational behavior. Some individual characteristics remain the same across time whereas some change depending on their internal and external conditions. By the end of this course, students are expected to have a thorough understanding of the individual dynamics that play an important role in organizational context. They will be able to

i) Analyze the human factors responsible for various events occurring within the organization

ii) Think critically about situations using theoretical underpinnings

iii) Undertake better management practices and decisions.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	3567	1407	733



Parallel Computer Architecture

Prof. Hemangee K. Kapoor
Computer Science and Engineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

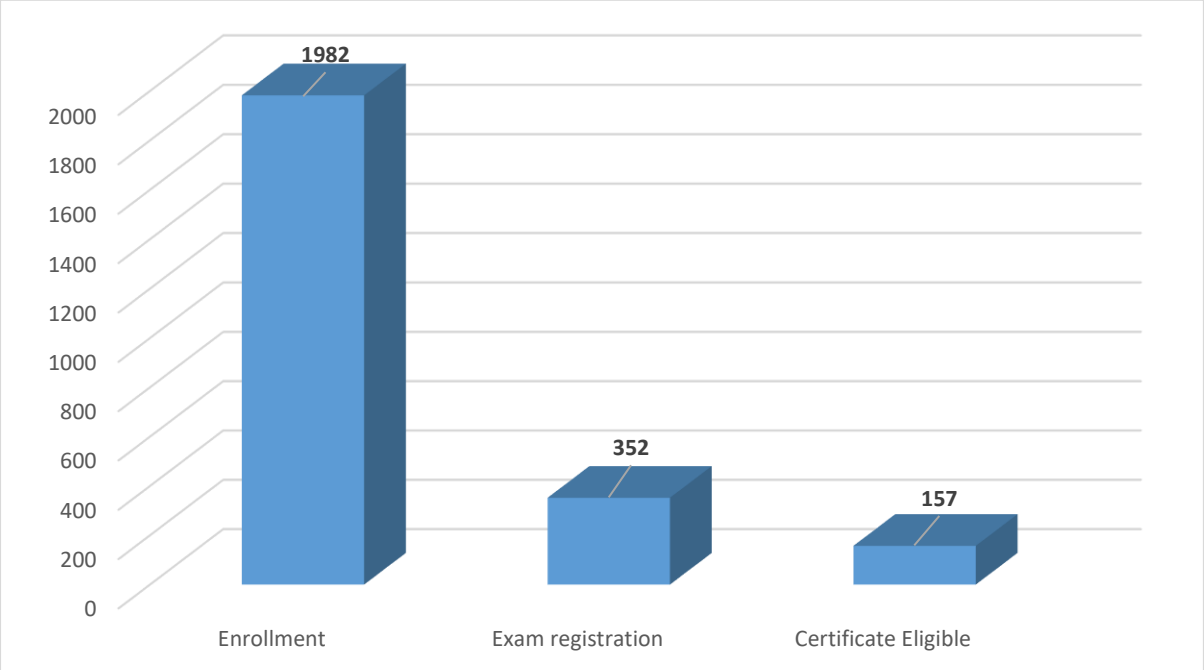
Course Outline:

With the emergence of application domains requiring large data processing as well as faster compute performance, parallel computing has become a critical component. This involves the use of multi-core processors as well as tightly integrated clusters of PCs and workstations. The most exciting development is the convergence of traditionally disparate approaches of shared memory, message passing and data driven computing onto the same platform

As the parallel applications communicate with each other using sharing data; it is important to correctly manage the shared data within the memory hierarchy to avoid inconsistency. Here, we need to understand the mechanisms used for data access, communication and coordination of work and its correct implementation.

This course will introduce the eld of parallel architectures and discuss in-depth shared memory management for parallel architectures. We will also learn about the interconnection topologies and routing methods which are important for connection and communication of the multiple cores executing the parallel applications. The course will conclude with overview of various parallel architectures and on-going research directions.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	1982	352	157



Power Plant System Engineering

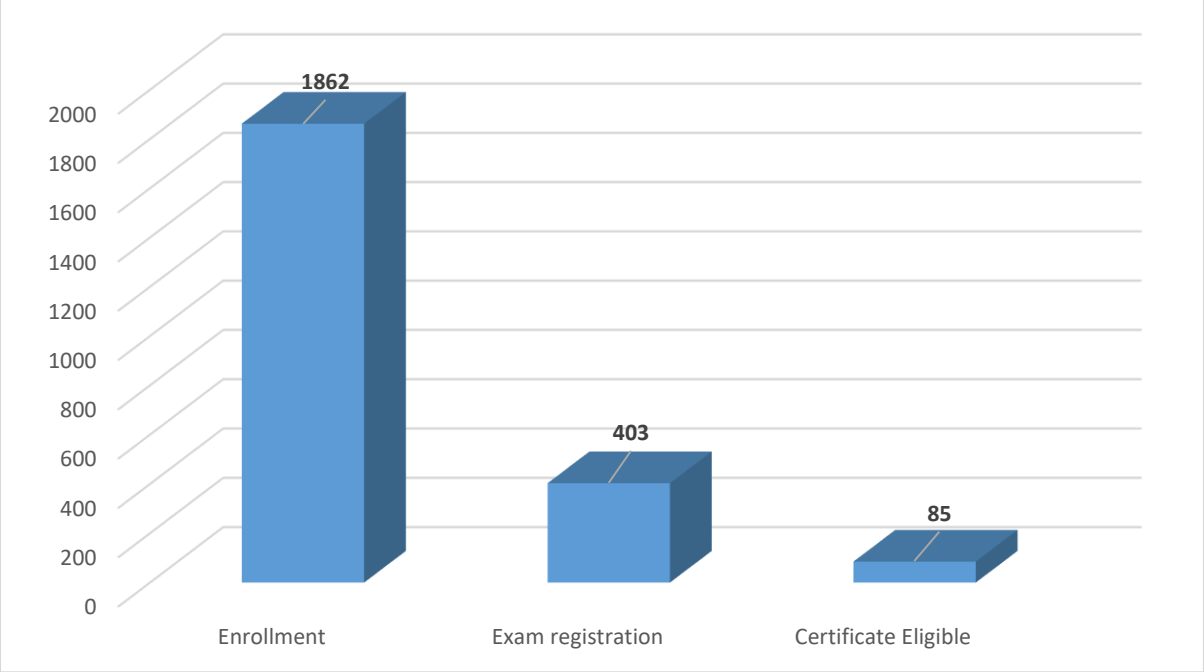
Prof. Niranjan Sahoo
Mechanical Engineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

The thermodynamics analysis of steam power plant is a topic of fundamental interest to Mechanical Engineering and Energy Engineering disciplines. Classically, the course on â€œPower Plant Engineeringâ€ is most popular in the engineering colleges of the country where only steam power cycle and its subsequent execution of power generation from steam are addressed. In this backdrop, the new the course on â€œPower Plant System Engineeringâ€ is proposed with advanced topics on power generation mechanisms from various energy resources. It covers fundamental aspects steam generation mechanisms (such as boilers, re-heaters, super-heaters), steam power generation units (impulse and reaction turbines), condensing units and cooling towers. With recent crises of fuel (coal) and stringent emission norms, the steam power system is normally integrated with gas power cycles through cogeneration mode of power generation. So, few contents of the course are emphasized towards gas power system. In addition, fundamental theories of power generation from non-conventional and renewable energy system are a recent inclusion in this course. The course contents are explained in simplified and lucid manner for beginners of intended audience. The scientists and practicing engineers of R&D organizations and public sector undertakings, will gain the fundamental glimpses on working principles and thermodynamic aspects of power plants. The syllabus is framed with respect to guidelines of â€œMechanical/Energy Engineeringâ€ AICTE approved UG course curriculum. The methodical online teaching, problem solving approach and online evaluation will help the candidate for credit transfer for their course curriculum.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	1862	403	85



Psychology of Emotion: Theory and Applications

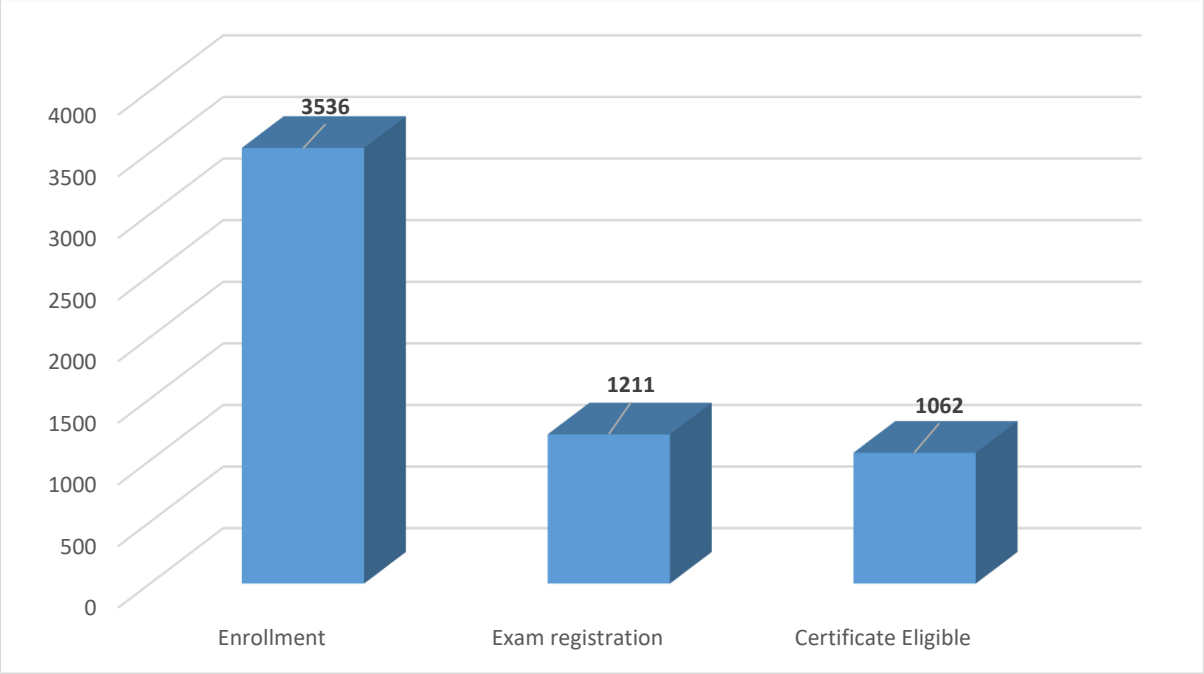
Prof. Dilwar Hussain
Humanities and Social Sciences

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

We are emotional beings. We cannot imagine human life without diverse emotional experiences. Emotions are integral to every aspect of our life and psychology. Emotions have purpose and we need to handle them with curiosity, understanding and wisdom. This course will provide a comprehensive understanding and applications of the psychology of emotions and emotional intelligence. This course will address some major questions associated with the scientific study of emotions, such as-What are emotions? Are they universal or culture specific? How they influence our brain and body? What happens when we are not able to manage emotions? Is there emotion based psychological disorders? Can we learn to regulate destructive emotions? What are positive emotions and happiness? Can we enhance them to experience more satisfaction in our life? What is emotional intelligence? Why it is so important for success and satisfaction in our personal and professional life? Can we learn the skills of emotional intelligence?

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	3536	1211	1062



Quantum Entanglement: Fundamentals, measures and applications

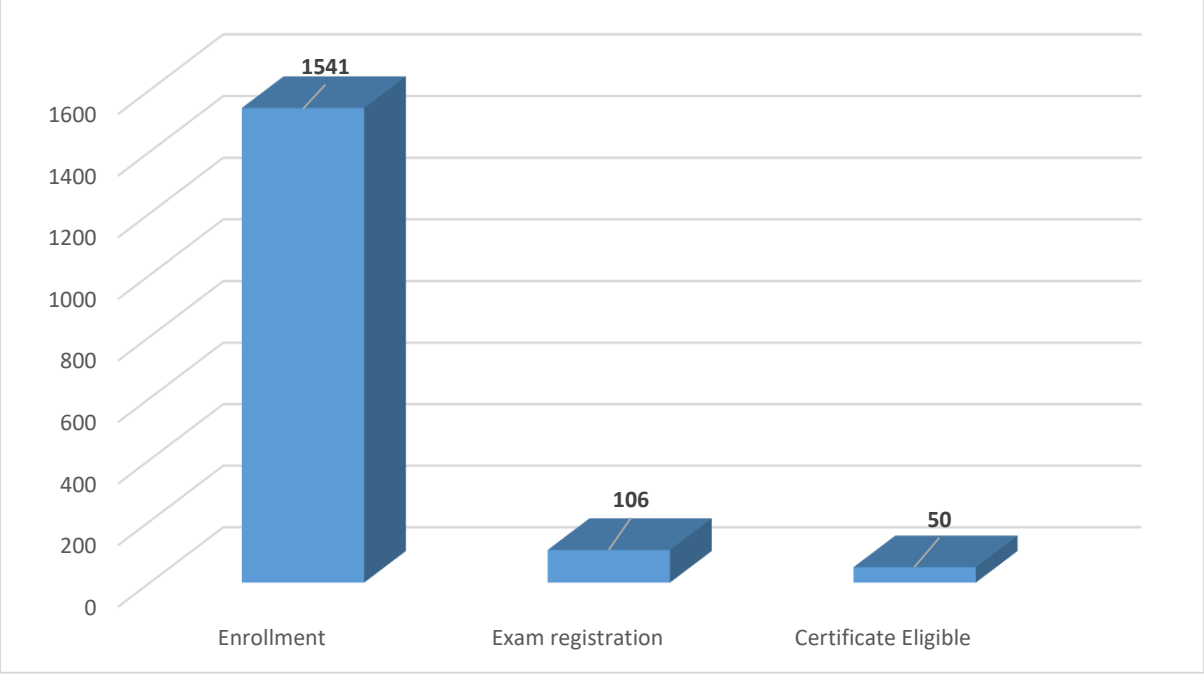
Prof. Amarendra Kumar Sarma
Physics

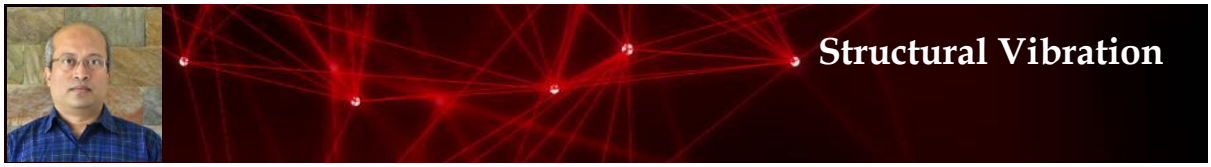
Type of the course: New, Jan 2024 run Duration: 4 weeks

Course Outline:

In recent times, there is huge interest in quantum computation and quantum information science. In this context, quantum entanglement is drawing tremendous interests from students as well as researchers. Unfortunately, the topic of entanglement is not covered anywhere in an accessible way. This course will enable the students to understand the fundamentals behind quantum entanglement. Also, they will learn associated mathematical tools to quantify entanglement. The course will prepare and motivate them to take a research carrier in this highly promising modern area of inter-disciplinary research.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	1541	106	50





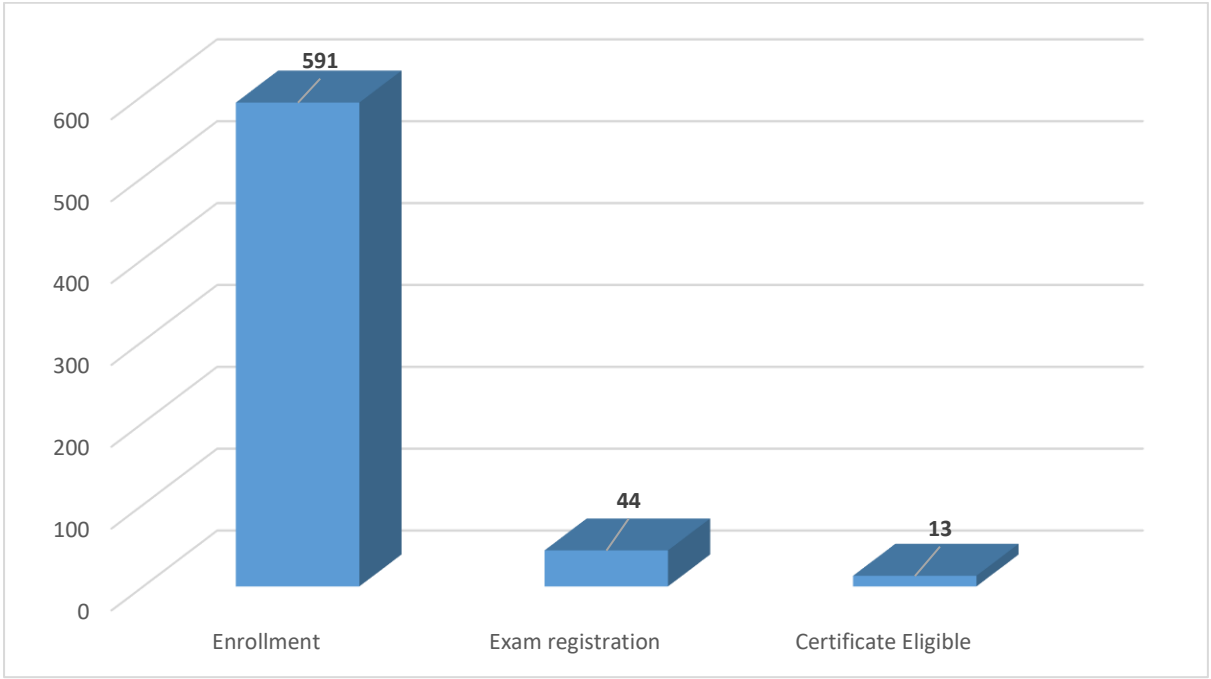
Prof. Arunasis Chakarborty
Civil Engineering

Type of the course: New, Jan 2024 run Duration: 12 weeks

Course Outline:

The course introduces the basic concept of dynamic equilibrium, Degrees of freedom, and equation of motion at the beginning. Then the learners are introduced to the free vibration of the SDOF system with Viscous and Coulomb damping followed by forced vibration of the SDOF system. Then the half-power bandwidth technique, energy dissipation due to damping, and equivalent / rate-independent damping are introduced. It is followed by different methods of the numerical response evaluation, the response spectrum, and the preparation of the elastic design spectrum with the examples solved using MATLAB. Then the MDOF system is introduced with eigen solution-based decoupling for modal superposition, time history analysis, and response spectrum analysis for the multistoried buildings are explained with examples in MATLAB. The free and forced vibration of a continuous system are also covered. At last, the dynamic analysis of a building using Finite Element software is demonstrated.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	591	44	13



Topology and Condensed Matter Physics

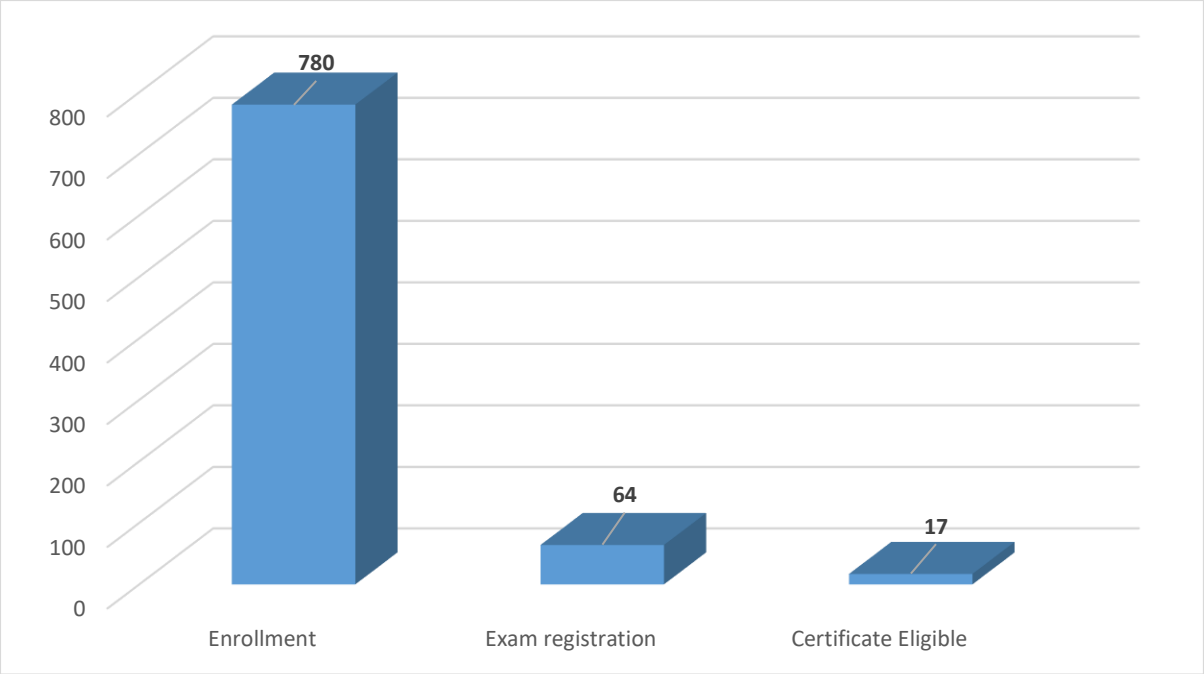
Prof. Saurabh Basu
Physics

Type of the course: New, Jan 2024 run Duration: 8 weeks

Course Outline:

The study of Condensed Matter Physics is no longer the same after a series of important discoveries in the eighties of the earlier century. It has digressed from conventional topics to the emergence of a topological order that is found to be responsible for a number of exotic features, such as Quantum Hall effect, electronic and transport properties of Graphene and Weyl semi-metals etc. This course gives an overview of topological implications in the field of condensed matter and material science and will be very crucial to students who wish to join PhD in the field. Also, for the enthusiastic teachers, who teach solid state physics at the undergraduate or the graduate level, this course will render a novel viewpoint to the experiments and theory.

Timeline	Type	Enrolled	Registered	Certified
Jan-Apr 2024	New	780	64	17



Economics of Health and Education

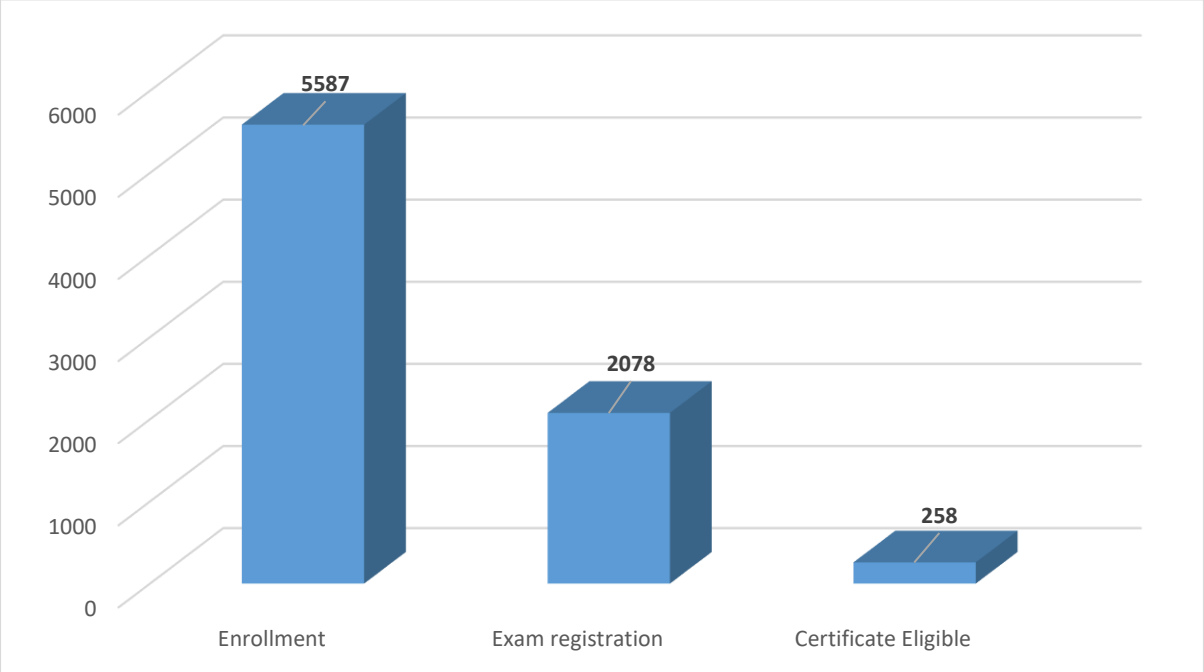
Prof. Rajshree Bedamatta
Humanities and Social Sciences

Type of the course: New, July 2024 run Duration: 12 weeks

Course Outline:

Economics of Health and Education will introduce students to the microeconomic foundations of health and education as economic goods. This course will lay emphasis on theory and practice. The focus of this course will be on the developing countries experience with particular reference to India. We will draw knowledge from the larger literature on human capital and human development and understand the linkages and implications. To be able to carry out empirical analyses as an outcome of this course, students will also learn about the current health and education policy of India as well as the most used databases. General lectures on public health and education in India are planned to introduce students to the debates in this field. All candidates interested in understanding the health and education sectors of developing countries such as India are encouraged to enroll.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	5587	2078	258



Engineering Psychology

Prof. Naveen Kashyap
Humanities and Social Sciences

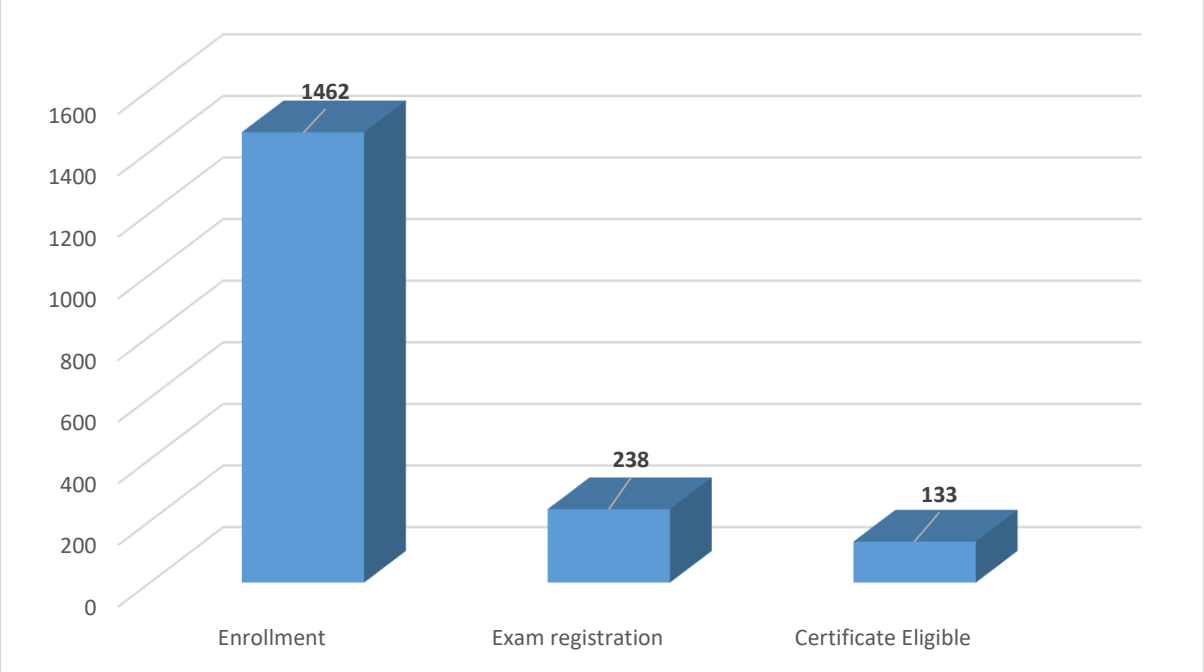
Type of the course: New, July 2024 run

Duration: 8 weeks

Course Outline:

Psychology helps us in understanding our own behavior and the behaviors of others. The field of engineering psychology helps us in solving engineering within the limits of human cognition. The present course will discuss some basic engineering design problems and provide solutions to these using the basic concepts of human cognition

Timeline	Type	Enrolled	Registered	Certified
Aug-Oct 2024	New	1462	238	133



Labour Welfare and Industrial Relations

Prof. Abraham Cyril Issac
School of Business

Type of the course: New, July 2024 run Duration: 12 weeks

Course Outline:

Industrial Relations and Labour Legislation is a subject broadly concerned with nuances of employment. This is a multidisciplinary field of study which examines the interrelations of varying complexities between employers and employees, employer organisations and the state with trade and labour unions. Industry is one of the major contributors to the growth of Indian economy. As such it is pivotal to ensure the smooth functioning of the interrelationship between the stakeholders, namely, employers and employees. This makes it imperative to be well averse with the labour legislations of the country, in order to promote the worker's welfare, along with achieving the nation's economic prosperity. With the help of Industrial Relations laws, living standards can be improved, and increased globalization could be achieved through flexibility in the labour market. Similarly, labour legislation laws mediate work relationships and focus on the right of the employees at the place of work. It prevents exploitation of workers, at the hands of the employers.

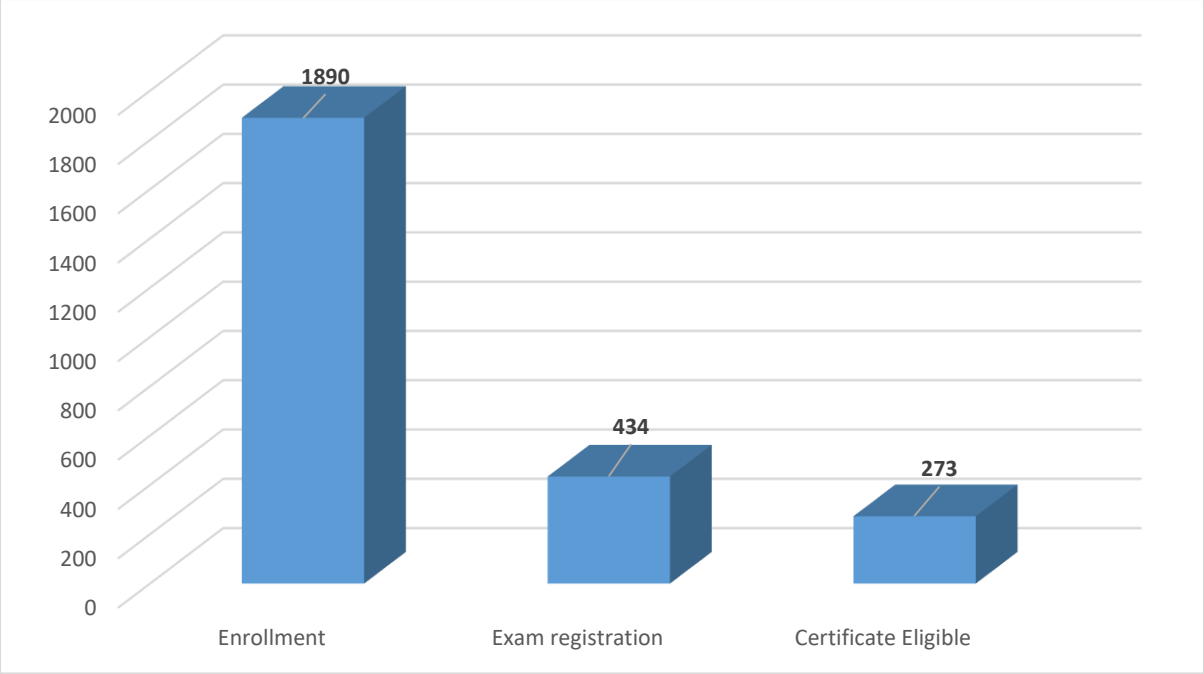
This course will provide a detailed understanding of the labour-industry interface and will serve as a source of practical knowledge to learners. The course will also introduce learners to the Labour Codes developed in 2019-20 which consolidates the central labour laws into broader groups of Labour Codes.

Learning outcomes:

On completion of the course, learners will be

1. Exposed to various IR situations and will learn extant laws that apply to a given set of contexts within the ecosystem of work.
2. Familiarized with the administration of labour laws in India at the National and State levels
3. Enhancing their understanding on functioning of labour related departments.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	1890	434	273


1890
434
273
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Enrollment
Exam registration
Certificate Eligible

Materials Processing (Casting, Forming and Welding)

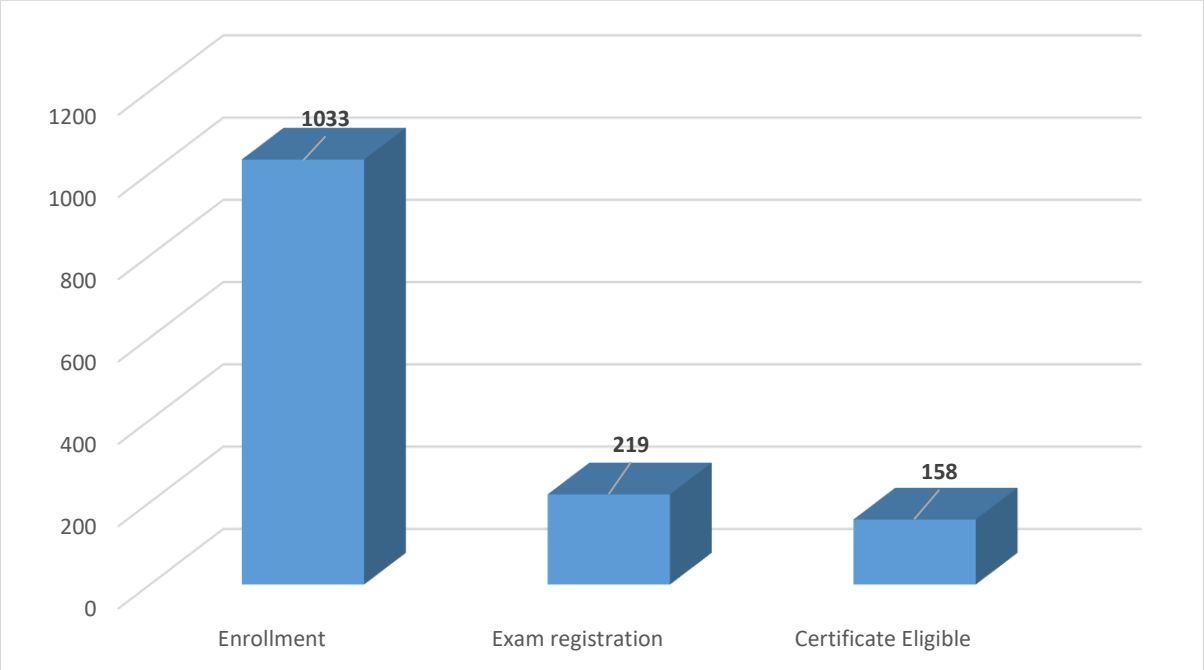
Prof. Swarup Bag
Mechanical Engineering

Type of the course: New, July 2024 run Duration: 12 weeks

Course Outline:

The progress of material processing is ever challenging with the development of new materials and their application in modern technologies. Materials processing effectively transforms the raw materials into useful products and largely decides the thermal, electrical, mechanical and other characteristic properties. The specific properties of materials, useful coating, thin film deposition, and integration of fibers mainly bring the functional properties of modern optical, electronic, and biomedical devices. Material processing technologies are mainly explained by heat transfer and material flow, diffusion, phase transformation and solidification that bridge the gap between manufacturing science and engineering. The syllabus is oriented to the conventional and advancement of the material processing technologies. The modules cover almost all the direction of material processing technologies and it is blended with fundamental development to the recent technologies. Audience will be able to develop fundamental understanding on different perspective and recent development in this field through the lectures and reinforce their knowledge by solving assignments. This course is presented in a lucid and simplified way to make it enjoyable to the beginners.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	1033	219	158



Photonic Crystals: Fundamentals & Applications

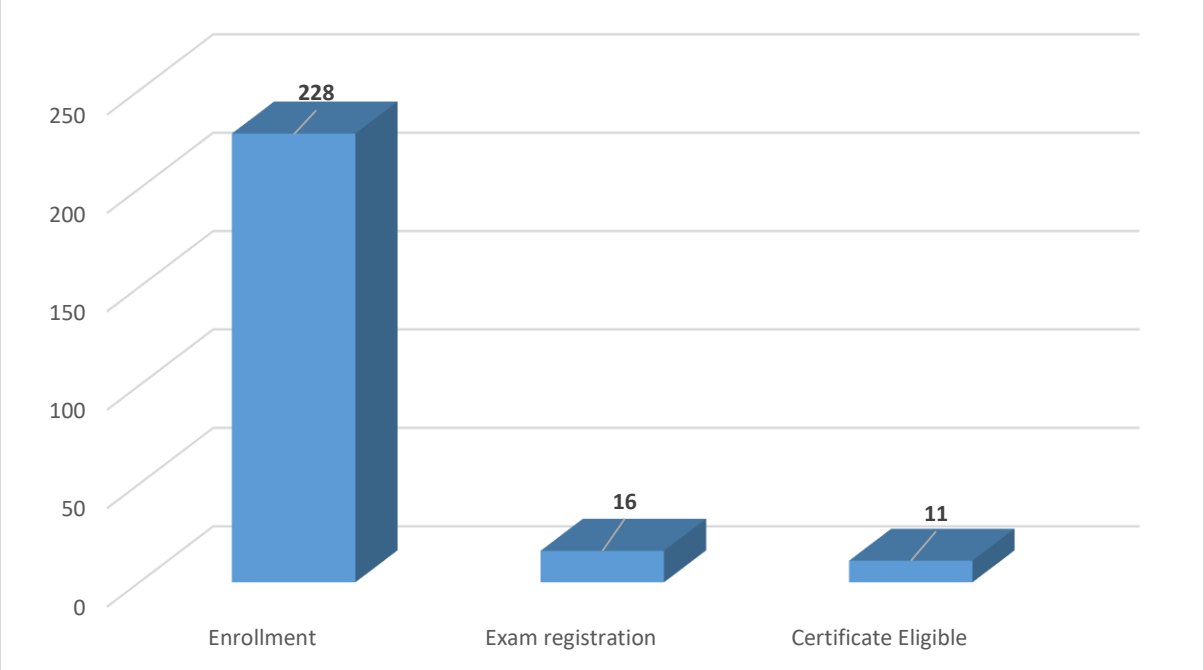
Prof. Debabrata Sikdar
Electronics and Electrical Engineering

Type of the course: New, July 2024 run Duration: 12 weeks

Course Outline:

The course provides a detailed introduction to the versatile photonic-crystal technology by covering its fundamentals and an overview of the latest advancements with examples. The properties of light propagation in simple to complex photonic crystals are discussed thoroughly with appropriate theoretical tools which would help undergraduate students and postgraduate/industrial researchers in developing intuitions about how photonic crystals need to be designed for a specific application. The course begins with fundamentals of electromagnetic theory of light in periodic dielectric media, and then discusses 1D, 2D, and 3D photonic crystals/slabs in details. Later on, the course will focus on designing photonic crystals for applications such as mirrors, waveguides, cavity, filters, splitters, sensors etc. needed for in modern high-speed communication systems. With simple pre-requisite of familiarity with macroscopic Maxwell's equations and eigenmodes, this course will provide a comprehensive platform with needed numerical and physical tools for designing photonic crystal devices for different applications.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	228	16	11



Power Electronics Applications in Power Systems

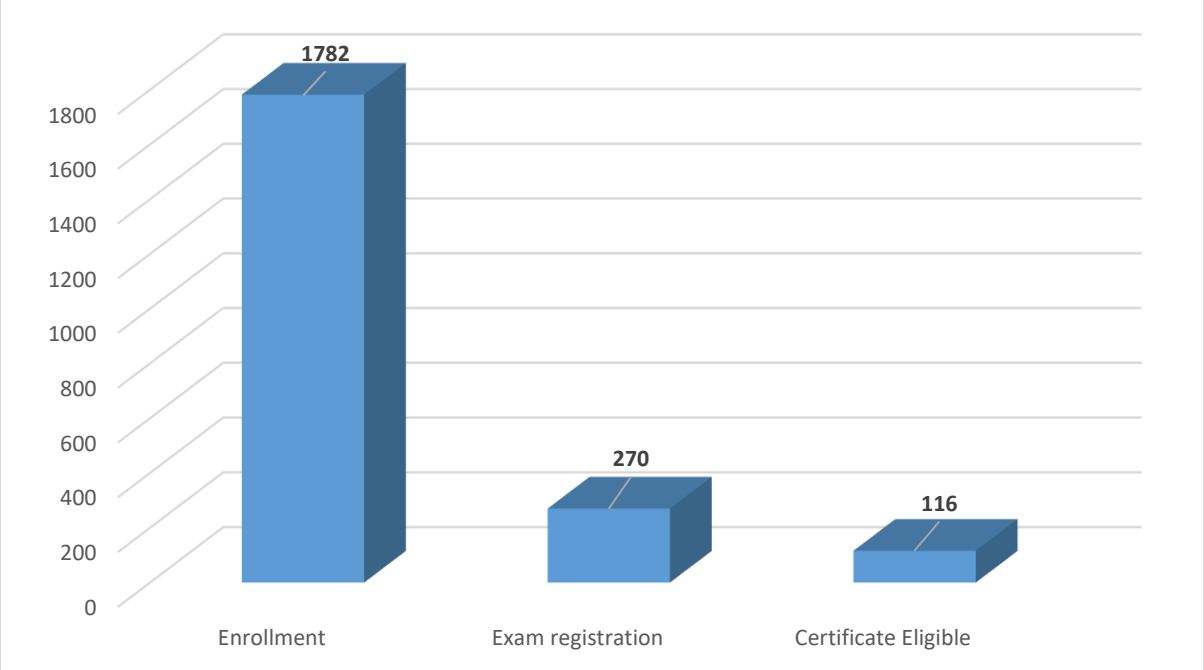
Prof. Sanjib Ganguly
Electronics and Electrical Engineering

Type of the course: New, July 2024 run Duration: 12 weeks

Course Outline:

Electrical power system is growing very fast in a country like India. Thus, the operation of electrical power system becomes more and more complex. To enhance the reliability and to have faster control, there needs power electronics-based devices. There are various NPTEL courses to understand the basic electrical power systems. There are some advanced power system courses, as well. Similarly, there are few basic and advance power electronics courses. The Flexible AC Transmission Systems, popularly known with the acronym FACTS, provide the power electronics-based solutions to enhance the capability of electrical power transmission systems. This course focuses the application of these power electronics-based solutions in power systems. The course will start with the recapitulation of some basic concepts and modelling of electrical power transmission systems. Then, the mathematical modelling of various FACTS devices will be discussed. Then, the applicability of those devices in mitigating various problems of power transmission systems and in enhancing the performances of power transmission systems will be discussed in details.

Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	1782	270	116



Statistical Physics of Non-Interacting and Interacting Systems

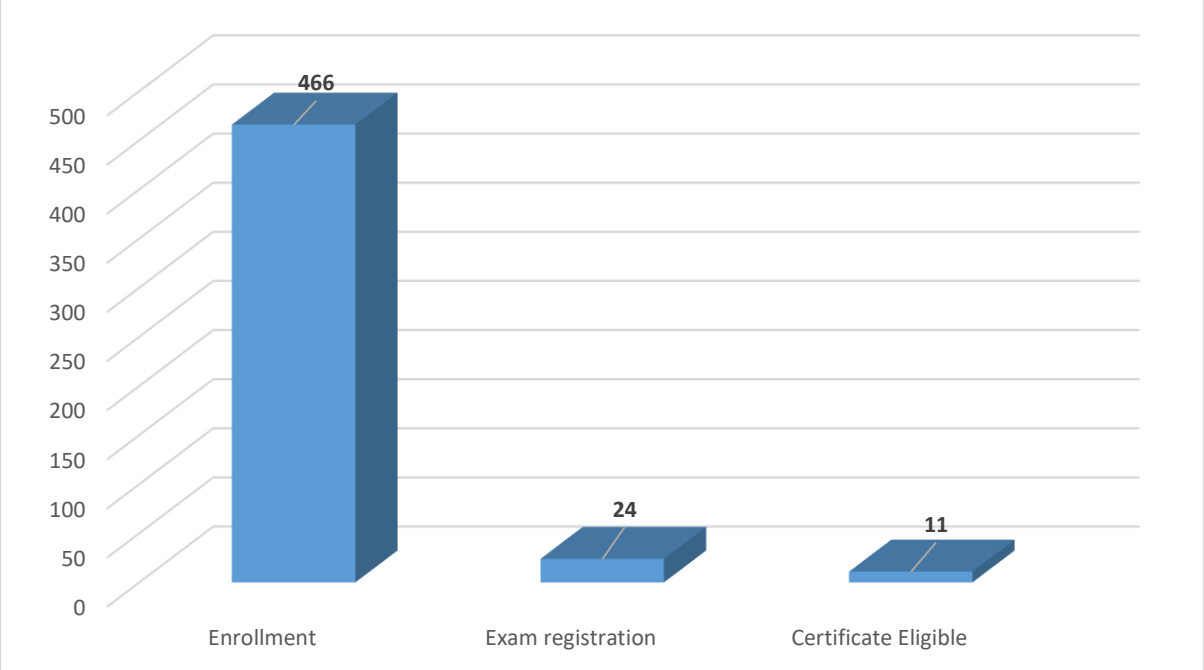
Prof. Saurabh Basu
Physics

Type of the course: New, July 2024 run Duration: 12 weeks

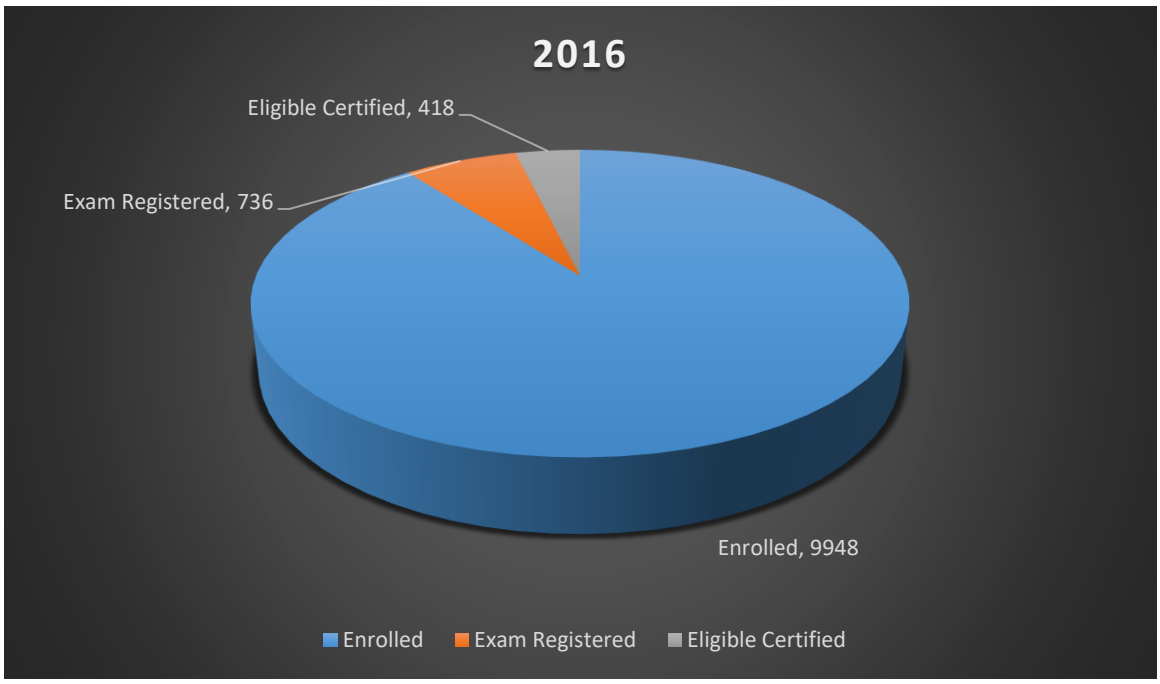
Course Outline:

The course introduces the reason to study statistical mechanics when thermodynamics yields an equilibrium description of the systems. The basic concepts of the subject are explained from a formal viewpoint that deals with the concept of ensembles and ergodic hypothesis. Quantum statistical mechanics appears as an upgradation of the classical ideas that incorporates the indistinguishability of the particles, and thus is applicable to the 'microscopic world' of bosons and fermions. Several examples are discussed in this context, such as Bose-Einstein condensation, magnetism of fermionic systems. Besides, there are special topics, such as, Chandrasekhar limit, thermodynamics of black holes etc Further, as interacting systems are ubiquitous in nature, and hence require an introduction to the masters and the PhD students. Different examples of interacting systems are discussed through Ising model, Heisenberg model etc and specialized techniques such as Bethe ansatz are discussed.

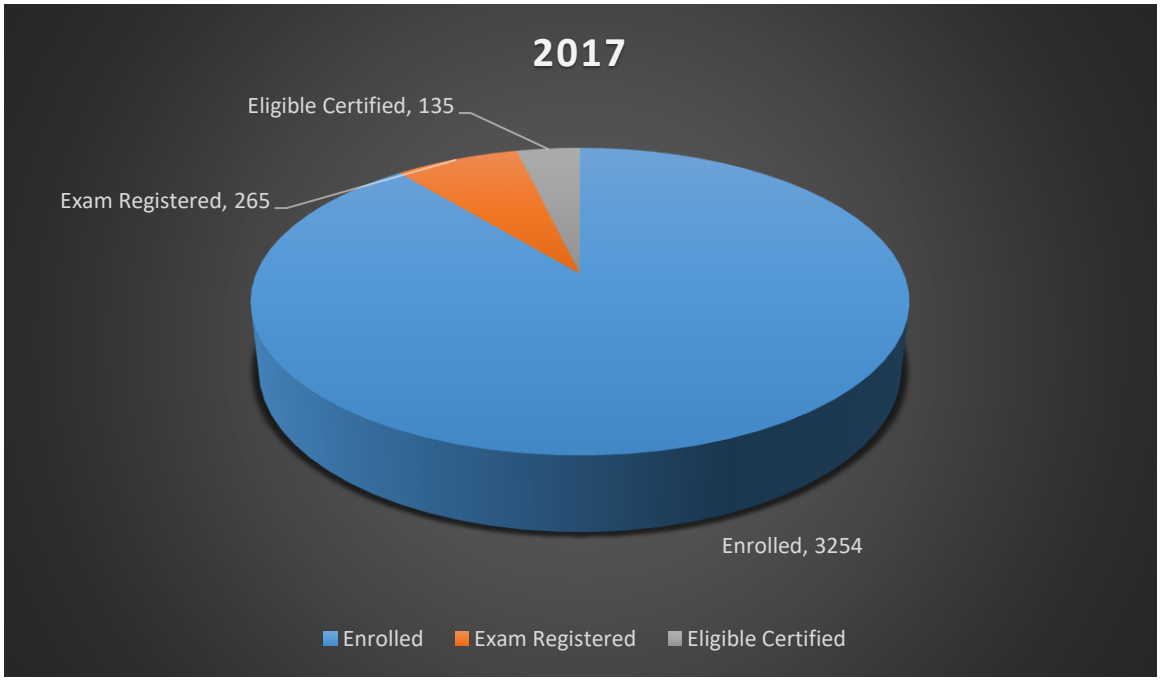
Timeline	Type	Enrolled	Registered	Certified
Jul-Oct 2024	New	466	24	11



IIT Guwahati contribution in 2016 run_Cumulative Data
Total Couse: 4

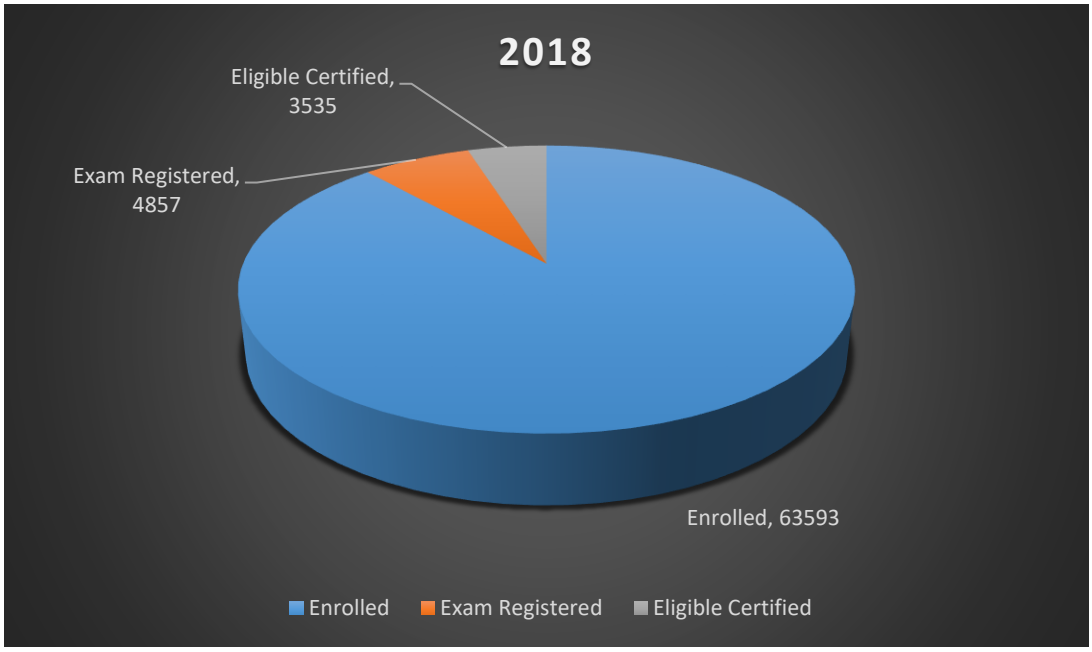


IIT Guwahati contribution in 2017 run_Cumulative Data
Total Couse: 4



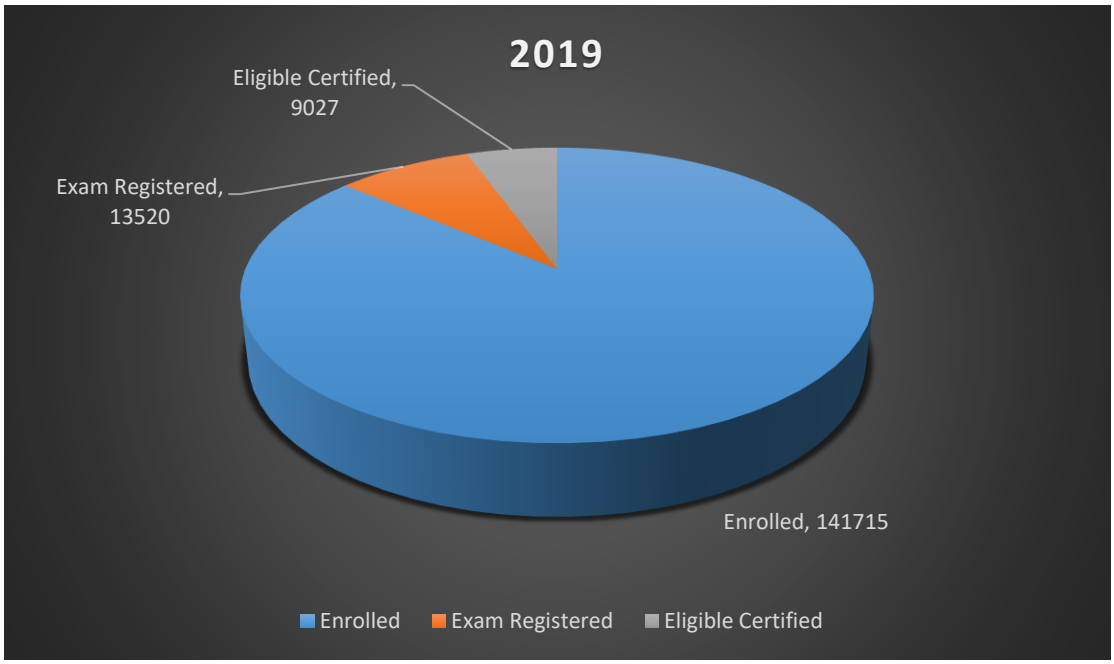
IIT Guwahati contribution in 2018 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2018 (Jan)	15	24021	1704	1272
2018 (July)	18	39572	3153	2263
Total	**33**	**63593**	**4857**	**3535**



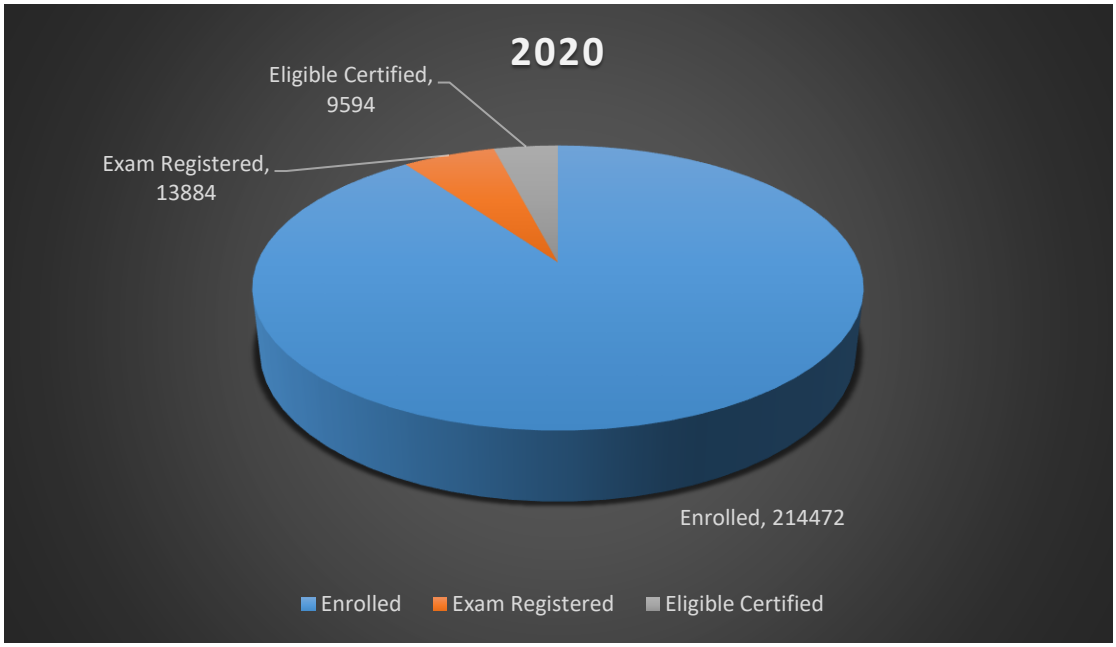
IIT Guwahati contribution in 2019 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2019 (Jan)	18	51665	5955	4659
2019 (July)	34	90050	7565	4368
Total	**52**	**141715**	**13520**	**9027**



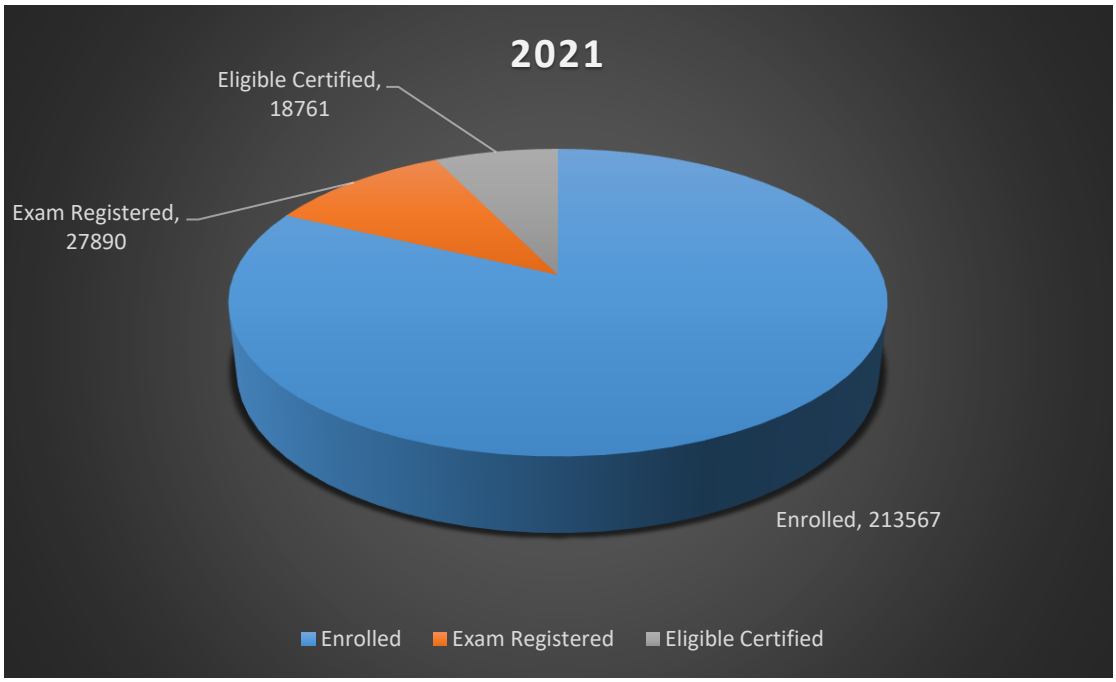
IIT Guwahati contribution in 2020 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2020 (Jan)	30	70462	1922	1259
2020 (July)	46	144010	11962	8335
Total	**76**	**214472**	**13884**	**9594**



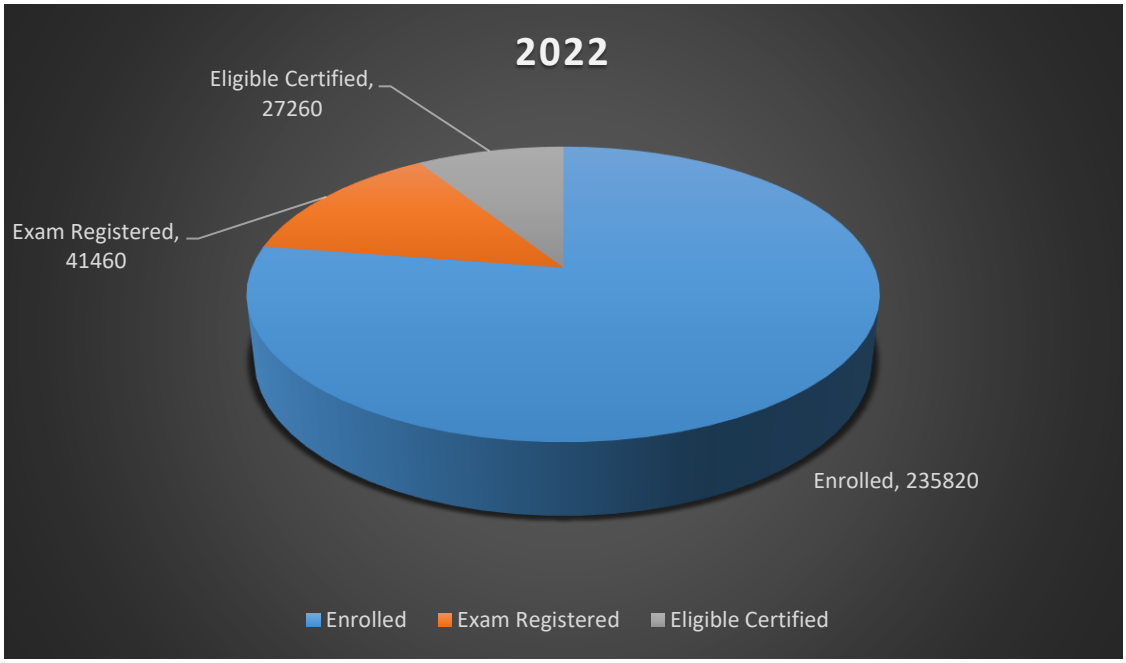
IIT Guwahati contribution in 2021 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2021 (Jan)	48	84313	10397	7064
2021 (July)	62	129254	17493	11697
Total	**110**	**213567**	**27890**	**18761**



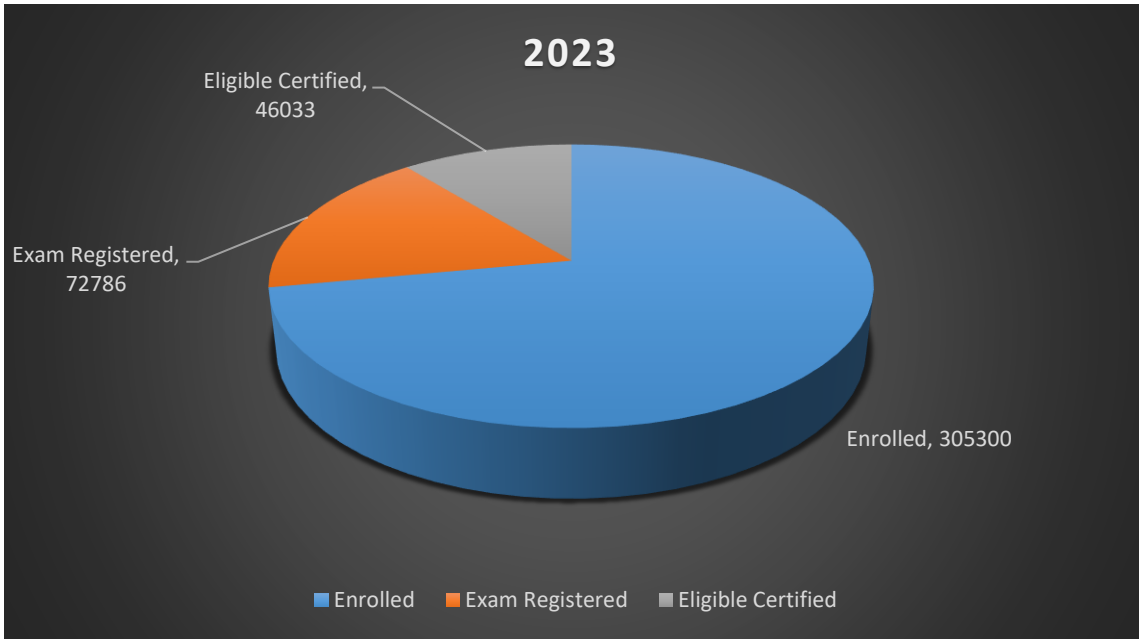
IIT Guwahati contribution in 2022 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2022 (Jan)	54	105669	16955	11122
2022 (July)	69	130151	24505	16138
Total	**123**	**235820**	**41460**	**27260**



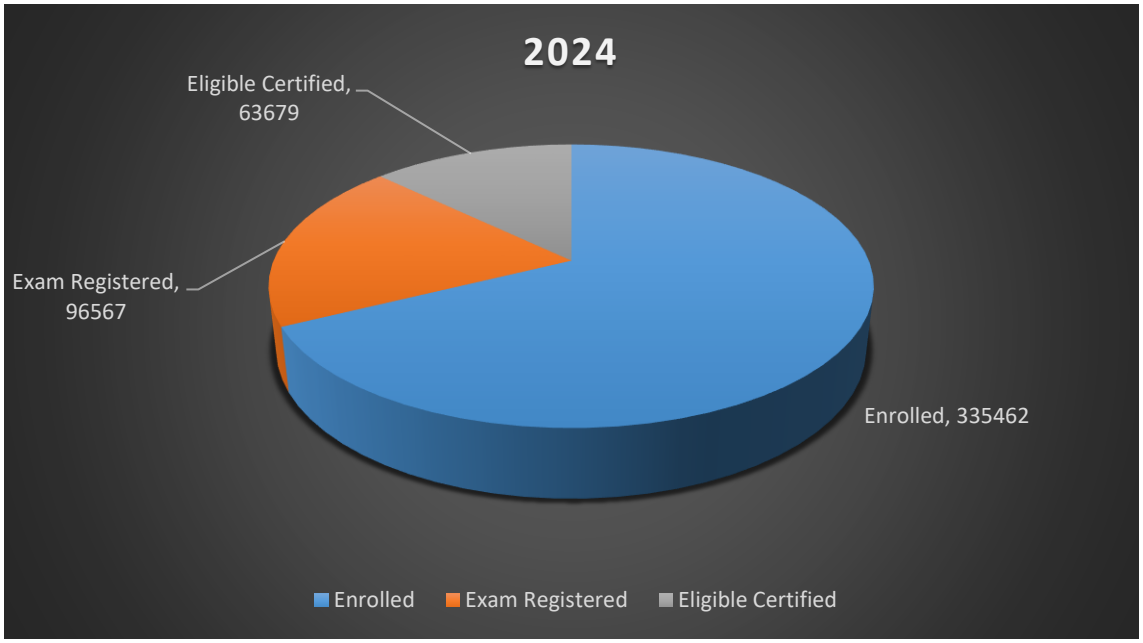
IIT Guwahati contribution in 2023 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2023 (Jan)	61	105453	23769	16091
2023 (July)	78	199847	49017	29942
Total	**139**	**305300**	**72786**	**46033**



IIT Guwahati contribution in 2024 run_Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2024 (Jan)	75	139977	38175	26410
2024 (July)	83	195485	58392	37269
Total	**158**	**335462**	**96567**	**63679**



IIT Guwahati contribution in 2016-2024 Run Cumulative Data

Year	Total Course	Enrolled	Registered	Certified
2016-2024	699	1523131	213573	141173