

Ishān Vikās

A Comprehensive Program to Introduce Undergraduate Students from North Eastern States to High Quality Academia

**An Initiative of
the Ministry of Human Resource Development
and
Indian Institute of Technology Guwahati**

The Ishan Vikas initiative was converted into reality due to continuous involvement of Hon'ble Minister of Human Resource Development, Smt. Smriti Zubin Irani.

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Significant help and encouragement was received from Mrs. Amita Sharma (Retired IAS), Mr. Amarjeet Sinha (IAS), Mr. Alok Mishra (IAS) and Mr. Vineet Joshi (IAS).



National Institute of Technology Agartala

Host: Indian Institute of Technology Kharagpur

Participants:

Aman Srivastava
Ravi Prakash Bajpai
Santosh Kumar
Vivek Kumar
Ruchi Sharma
Romsha Mangla

Faculty

Prof. Nirmalya Kar

Aman Srivastava

Electrical Engineering, BTech 5th Semester
National Institute of Technology Agartala

The ‘Ishan Vikas’ Scheme under the Ministry of Human Resource Development (MHRD) has proved to be one of the most inspiring and motivating programs. This program made me open to new ideas and technologies, which could be helpful and could play a very vital role to change the current prevailing conventional processes involved in engineering. The program primarily focused on how the various inter-disciplinary technologies can be clubbed together to give rise to a new innovation that could be far helpful, just not limiting to one discipline but could be helpful to other disciplines as well. We got to know about the emerging trends in the research and how one important technology or an innovation, solely belonging to one discipline, could be incorporated into various other disciplines, so that it could find its way to enhance the prevailing technologies. We, during our stay in Indian Institute of Technology Kharagpur (IIT-KGP), were being guided by Dr. Dhrujyoti Sen Sir, who was not only a mere mentor to us, but also he was a nice person.

On the day one of the ‘Ishan Vikas’ program, we were introduced to Social Network system by one of the Assistant Professors of the CSE department of IIT-KGP. We were taught the importance of references and citations while writing a research paper. Also, the professor introduced us to the time cycle of programming and he took us back in time when there was no sign any programming language and how slowly and gradually they came into existence. During that session we also learnt some of a bit complex topics such as how a frame is being transferred and received with some amount of error being attached to it. The way these important topics were told was absolutely brilliant and I, being a core Electrical Engineering student was able to get most of the points taught. The day also introduced us to the concept of Cloud Computing, and we were being demonstrated that how this very concept would be helpful in storing a large data and this indeed amazed us.



Day two marked the introduction to Automation and Robotics by Prof. C.S Kumar. In his lecture, he showed us the impressive techniques used in Robotics and Automation. He also introduced us to the concept of 3-D printing and showed us how this technique is helpful in manufacturing small tissues and parts. He also accompanied us to the Robotics lab and showed us the current projects undertaken by the students. We also came across a Robotic machine that could be accessed remotely from any location in the world. We were also shown an AUV (Automatic Underwater Vehicle) which a part of the students’ project. The after break session was conducted by a professor whose area of

interest was Statistics and Probability. He drove us back in time to teach how probability and statistics emerged as a whole new discipline and how the research was carried out in it. From the origin to the current emerging trends, the professor showed us how this branch could prove to be of much help in real life.

Meanwhile this program was being conducted, we happened to come across the Nehru museum, a part of IIT-KGP, whose chairman was Prof. Sen himself. He told us about the history of IIT-KGP and how it transformed from a detention camp during the time of independence to a world recognised institute. We came across various science models, which worked on the basic science principles and demonstrated us practically how these were held true in real life.

On day three, we had an excursion in which Sen Sir took us to visit a dam on Damodar River near Durgapur. We were told the engineering behind the making of the dam and how the dam works during heavy rains to control flood. This excursion was an innovative method to teach much complex engineering very easy to understand. We had our halt in NIT Durgapur on the third day. The next day, i.e. the day four, we were taken to a much bigger dam on the Damodar River near the Maithon hills in Dhanbad. Sen Sir told us about some of the minor engineering innovations that were involved in the making of the dam and how hydroelectric power is generated. The trip really opened our minds to the basic engineering techniques that are most helpful in engineering.

The 'Ishan Vikas' program helped us a lot to learn and understand various engineering techniques. We also learnt how different important engineering techniques, solely belonging to one discipline can be incorporated in various other disciplines so that it could give rise to a whole new innovation, serving the purpose well, and helping shape a better future.

Ravi Prakash Bajpai

Computer Science and Engineering, BTech 5th Semester
National Institute of Technology Agartala



By this program I got an exposure to premier institute of india. I had a very great experience by this program, which will help me in the future.

It was a 5 days program as scheduled by IIT Kharagpur. Our faculty coordinator was Prof. Nirmalya Kar from computer science & engineering department, NIT Agartala and our IIT Kharagpur coordinator was prof. Dhrubajyoti Sen from Civil Engineering department, HOD of School of Water Resources, IIT Kharagpur. For us lectures were planned in different field of Engineering.

On day 1 morning session there was a lecture on recent trends in research paper publishing and social networking by prof. Animesh Mukherjee of CSE department, IIT Kharagpur prof described us the importance of algorithms and graph in field of research. After that there was a lecture on computer networking by Prof. Pabitra Mitra. sir described the basic computer networking principle and methodology. After lunch we had a lecture in information technology department by the Prof. Soumya Ghosh. the prof. told us about recent trends in information technology field like cloud computing and big data.

On day 2 in morning session we had a lecture in mechanical department by prof. C.S Kumar . the sir gave us idea about projects are being done in field of Mechatronix and Robotix. prof also demonstrated the projects are being done in IIT Kharagpur. Sir described us the field of artificial intelligence and 3d printing. sir told us idea how 3d printing and artificial intelligence can change the field of space technology. after that we had a lab visit in mechanical department by Prof. C.S Kumar. He presented demos on Quadcopter, Uav's and dancing robots.

In afternoon session we had a lecture of advance probability theory in maths department by Prof. Somesh Kumar. Prof explained us the advance things in the field of probablity in very simple and systematic way.

Apart from these lecture Prof. Dhrubajyoti Sen took us to Nehru central museum. this museum has great historical importance. There was also a science gallery in which different science and mathematical models are present to give a better demonstration of concept of physics and maths.

In afternoon session of day3 and day4 there was a excursion program by Prof. Dhrubajyoti Sen for us. The prof. took us to Durgapur barrage and Maithon Dam ,it is a great work of civil, mechanical and electrical engineering.

In last day of our programme in first half we had a lecture on ordinary differential

equation by Prof. J.kumar and on second half we had a lecture on partial differential equation by Prof. G.P. Rajsekhar in very simple and systematic way.

Santosh Kumar

Civil Engineering, BTech 5th Semester
National Institute of Technology Agartala

On day 1, I interacted with Asst. prof. Animesh Mukherjee (CSE) who enlightened the use of computer science and engineering in the field of research. He also presented a lecture on Recent trends in research paper publishing. He also described the relation between human and social media, which was quite beneficial for



me. After that there was a lecture delivered on networking by prof. Pabitra Mitra, who gave a basic idea that how does a data transfer from one host to another.

In the afternoon session of day 1, I interacted with Prof. Soumya Ghosh who taught me the definition and types of computing. He especially described cloud computing and its valuable role.

On day 2, I met with prof. C.S. KUMAR who presented a lecture on Mechatronics. He described the use of 3d-printing in different fields. He mentioned the types of robotics like Industrial, Service and Exploratory. He presented demos on Quadcopter, Uavs and dancing robots.

At the end of day 1 & 2. I also visited Nehru Museum at IIT KGP which has a science gallery for students where different maths and science models are presented for easy demonstration of things. I also came to know the historic importance of Nehru museum. Next day, I also interacted with Prof. Somesh Kumar who presented a lecture on the simple approach to advanced probability and probability distribution.

After that, We had also an excursion program with prof. Dhruvajyoti sen to Maithon Dam and Durgapur Barrage, which was quite inspiring for me as a civil engineering student. On the last day, I interacted with Prof. J. KUMAR who presented a lecture on Numerical methods for Ordinary Differential Equation. In the afternoon session of the last day, I met with Prof. G. P. RAJSHEKHAR, who demonstrated Partial Differential Equation which was helpful for me.

At the end, I want to say that I have been benefited by Ishan Vikas Program as I got a chance to visit IIT KHARAGPUR and interact with professors and to get an idea to go through research in the future.

Vivek Kumar

Mechanical Engineering, BTech 5th Semester
National Institute of Technology Agartala



Attending the lectures by the professors of IIT KGP was really a great opportunity for us. We had been enlightened by their knowledge given to us. The experienced which we have got at one of the technologically remarkable institute on this globe, will undoubtedly help us to improve the way of learning wherever we exist.

IIT Kharagpur is a well versed and accomplished college. Learning from the professors of this institute was a great and exalted experience. Our professor in-charge “Dr. Dhruvajyoti Sen” HOD School of water resources, being a dynamic person, explored the entire IIT Kharagpur campus along with the concerned remarkable history behind the establishment of the

same. In our visit for 5 days, we have interacted with the professors of different departments of the concerned institute and try to learn as much as possible.

At the very first day of our programme, we had a brief visit of the campus. We explored the “Central Library” and saw the collection of huge varieties of books. We also had a glimpse of the digital library there. The very first interaction session was taken by Prof. Animesh Mukherjee. There we learnt about the social networking . In the next session taken by Prof. Pabitra Mitra, we learnt about “Networking”. We got to know about the types of connectivity schemes and the application layers in the networking. The next session on the “Cloud Computing” was taken by Prof. Soumya Ghosh. There we learnt recent trends in computing, essential characteristics of cloud computing, cloud services model, etc. We also had a demo on this by a final year CSE student (Harshit) of the institute. After attending these lectures we had a visit to the “Nehru Museum of Science and Technology” at the campus. The museum was accomplished with many indoor exhibits which include technical models. We also saw a documentary movie based on the history of this museum.

The very next day we had a session on “Mechatronics and Robotics” taken by Prof. C.S Kumar. We learnt about the various scopes of this field and its details. We learnt about Additive manufacturing and 3-D printing. We also had a visit to the laboratory of Mechanical Department. There we saw the various types of machines like 3-D printing machine and some on-going projects like Humanoid and Autonomous Underwater Vehicle. Prof. Kumar also introduced us by a drone and a mini robot kept in the laboratory. In the next session we acquainted with Prof. Somesh Kumar. We learnt “Probability” from him. He gave a brief introduction about the history of probability and statistics. We learnt various theorems of probability, sigma algebra, various rules, etc.

We continued with the probability on the coming day too. We did various types of problems and also learnt about the application of probability in the real world. After attending session we left for an excursion with Prof. Sen.



We went to the “Durgapur Barrage” and “Maithon Dam”. Prof. Sen explained us about the construction and designing of the barrage and the dam. He explained us well about these places. We came to know that this dam is located at Maithon 48km from Dhanbad in the Jharkhand. This dam was specially designed for flood control and generates 60,000 kW of electric power. There is an underground power station, the first of its kind in the whole of South East Asia. The dam is constructed on the Barakar River. We also learnt about the reservoir operation and how the gate of this dam opens during the time of flood. The excursion was really advantageous and fruitful for us as we got to know the things by visualising them.

After the excursion is over, the next day we had a session of “Numerical methods for Ordinary Differential equations”. In this session we learnt about types of numerical methods and the methods used for it . After that we learnt about “Partial Differential Equations” by Prof. G.P. Raja Sekhar. This was the last session at IIT KGP.

Ruchi Sharma

Electronics and Instrumentation, BTech 5th Semester
National Institute of Technology Agartala

IIT kharagpur is a well versed and accomplished college. Learning from the professors of this institute was a great and exalted experience. Our in-charge “Prof. Dhruvajyoti Sen” is a dynamic person. At the very first day of our programme, we had a brief visit of the campus. We explored the “Central Library” and saw the collection of huge varieties of books. We also had a glimpse of the digital library there. The very first interaction session was taken by Prof. Animesh Mukherji. There we learnt about the social networking . In the next session taken by Prof. Pabitra Mitra, we learnt about “Networking”. We got to know about the types of connectivity schemes and the application layers in the networking. The next session on the “Cloud Computing” was taken by Prof. Soumya Ghosh. There we learnt recent trends in computing, essential characteristics of cloud computing, cloud services model, etc. We also had a demo on this by a final year CSE student (Harshit) of the institute. After attending these lectures we had a visit to the “Nehru Museum of Science and Technology” at the campus. The museum was accomplished with many indoor exhibits which include technical models. We also saw a documentary movie based on the history of this museum.

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Romsha Mangla

Electrical & Communication Eng., BTech 5th Semester
National Institute of Technology Agartala

The reporting time was an auspicious day of New Year eve. The session of lectures commenced very next day. We had a small tour of the campus by Prof. Dhruvdyoti Sen which included the central library, and Nehru Museum Of science and technology.

Our first lecture of the very first day began with CS Prof. Animesh Mukherjee . He is doing research in social networking. His lecture was very insightful. Though data and facts in the presentation concerned more with IT but the concepts of paper publishing, the problem of plagiarism in scientific world and the trend analysis were applicable to all the branches. For the first time we had the opportunity to clear the misconceptions and see the real picture of ‘researches’. Next was the lecture about networking which I found very useful being a communication engineering student. After the lunch break we headed back towards the building where the ensuing lecture was scheduled. CS Prof Soumya Ghosh took us to the world of cloud computing. He taught us knit-grits of client-server concept and the various applications of cloud computing. We had a live demonstration of local cloud computing by Harshit, final year CSE. The day left us spellbound.

The second day was no different. But this time we learned about Robotics, mechatronics and 3D printing from Prof C.S Kumar. We were fortunate enough to see the 3D printer, the desi crude version of Asimov, various autobots, the automatic underwater diver in the JLR RP workshops. He also gave an insight into the field of MEMS which happens to be my area of interest. A major lesson that I learned was that to accomplish anything one needs a good mentor. Post lunch we went for our second lecture of the day. Prof



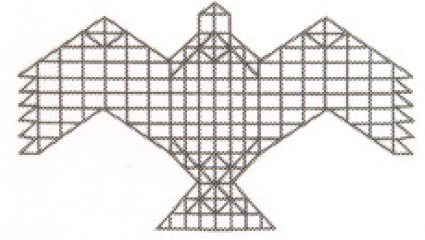
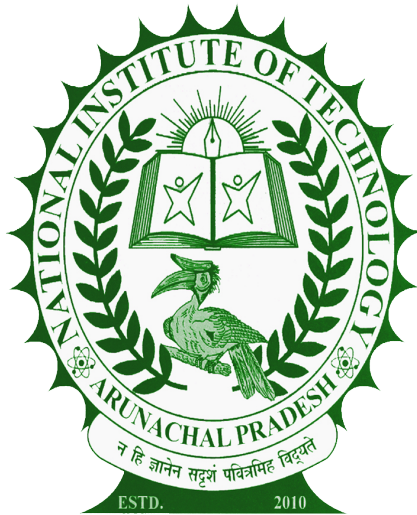
Somesh Kumar taught us probability and statistics that it is a practical concept and the results are meant to be analyzed instead of being calculated monotonously.

The third day had another lecture on the same topic only more elaborate. That afternoon we began our excursion trip to Mathain dam. The journey took the whole day. We saw Durgapur Barrage built on river Damodar and Barak and Mathain dam on river Barak. It houses the state of the art hydro power plant. Though we didn't get the chance to see the power plant from inside this would have been more educative.

The final day lectures were about solving ODE through numerical analysis via matlab though we could not get a chance to see matlab demonstrations.

To sum up the Five day visit to IIT KGP was an eye opener. We feel very fortunate to have the shot at learning and understanding so many things in so less time. We appreciate the efforts of all the professors, Our director Prof. Gopal Mugeraya and our faculty Asst Prof Nirmalaya Kar.





NIAS

National Institute of Technology Arunachal Pradesh

Host: National Institute of Advance Studies, Bangalore

Participants:

Ranvijay Singh

Nikhil Mishra

Vishnu Priya

Vasim Ali

Sourabh Prakash Roy

Bhawna Singh

Faculty

Mr. Shubhajit Das

Shubhajit Das

Assistant Professor, Department of Mechanical Engineering
National Institute of Technology Arunachal Pradesh

I am glad to inform you that under the Ishaan Vikas program, six numbers of students and one faculty have successfully undergone one week pre-internship program at National Institute of Advanced Studies (NIAS), Bangalore from 22nd to 26th December 2014.

The program mainly focussed on the scope of research in fields like Nano-technology, Fabrication processes, Art,Culture and Metallurgy, Astronomy, Artificial Intelligence, Entrepreneurship practice and Ecology to name a few. Apart from the regular lecture series, there were lab visits to IISc Bangalore which includes Centre for Nano Engineering, Climate Change Lab and Bio-Engineering Lab. The program also included a visit to the ISRO satellite centre followed by a visit to the Jawaharlal Nehru Planetarium.

Following are the experiences of the students regarding the program at NIAS, Bangalore:

Ranvijay Singh

Electronics & Communication Eng., BTech 5th Semester
National Institute of Technology Arunachal Pradesh

Courses were sufficient. It covered wide range of different fields of research. Lab tour was very innovative for us. We had small discussions of instruments on each device.

ISRO visit was very useful to us. ISRO visit explored idea about satellite launching and missiles. Fooding and accommodation was excellent. Each talk was very interactive. We had much time for questions and answers. Planetarium visit followed by lecture was good. Scheduling of courses was better and effective.

Nikhil Mishra

Electronics & Communication Eng., BTech 5th Semester
National Institute of Technology Arunachal Pradesh

Overall the program was too good...and by this program I was able to know about several things that I always wanted to know....this program was really full of knowledge.

Vishnu Priya

Computer Science and Engineering, BTech 5th Semester
National Institute of Technology Arunachal Pradesh

The Course was very interesting and encouraging. The Lecture by Prof. Baldev Raj (Director, NIAS Bangalore) on the topic “Science



is Fun” was really motivating. The Lab visits were really helpful for us. The interactions with the PhD. Students of IISc Bangalore were helpful. I would love to attend such programs in future.

Vasim Ali

Computer Science and Engineering, BTech 5th Semester
National Institute of Technology Arunachal Pradesh

Lab tour was very interesting for us. We had small discussions on each device. ISRO visit explored idea about satellite launching and missiles. Fooding and accommodation was excellent. Most of the lecture was very much useful in our daily life. We had very interesting question answer session on each topic. The program very much motivated us to do research. Planetarium visit followed by lecture was good. Scheduling of courses was better and effective but course of time is little bit less. Overall, it is very much interesting and useful.

Sourabh Prakash Roy

Electrical and Electronics Engineering, BTech 5th Semester
National Institute of Technology Arunachal Pradesh

The lectures on Astronomy and Astrophysics were really interesting. Lecture by Prof. Baldev Raj was highly motivating. Lab visits, interactive sessions and ISRO visit was fruitful. Facilities were excellent, NIAS campus needs special mention.

Bhawna Singh

Electrical and Electronics Engineering, BTech 5th Semester
National Institute of Technology Arunachal Pradesh

I think NIAS visit is the best visit on the topic of “SCOPE OF RESEARCH” which has given me exposure and make me know about how to do a research. It will surely be the best platform for every bright students not only for motivation purpose towards research but also for making them eligible to take the responsibility of the world because students are the assets of the world. But I think this programme should be extended to 7 to 8 days because time limit for each respective courses was very less and it was very difficult for us to switch very fast from one topic to another topic. But in spite of all this, this program was best. On behalf of NIT Arunachal Pradesh, we would like to thank MHRD and IIT Guwahati for giving us this opportunity to attend this course.





National Institute of Technology Meghalaya

Host: Indian Institute of Technology Bombay

Participants:

Sandeep Kumar Bardewa

Sneha Choudhury

Mararki Dkhar

Sakaldeep Chauhan

Ebormi Laloo

Sruti Goyal

Faculty

Mr. Nabajyoti Medhi

The news of the educational trip to Mumbai drove us to a different level of excitement. Under the Ishan Vikas Programme 2014, six students from the National Institute of Technology Meghalaya, namely Sandeep Kumar Bardewa and Sneha Choudhury from the Department of Electronics and Communication Engineering, Mararki Dkhar and Sakaldeep Chauhan from the Department of Electrical and Electronics Engineering, and Ebormi Laloo and Sruti Goyal from the Department of Computer Science Engineering were privileged to undergo a one-week pre-internship programme at Indian Institute of Technology, Bombay. The prestige associated with the programme along with the splendid location fitted perfectly into the idea of an ideal semester break for a technology-oriented student. We were accompanied by an Assistant Professor, Mr. Nabajyoti Medhi, of CSE Department, NIT Meghalaya.

The journey began with the dawn of 18th of December when we travelled down to Guwahati by a Tourist Sumo, followed by the boarding of flight to Mumbai the very same day. We had to fly via Delhi where we halted for about three hours and were provided with refreshment by our teacher. We reached Mumbai airport in the evening and travelled to IITB by two airport cabs.

Prior to journey, there was an email conversation with Prof. Madhu Belur (EE dept, IITB). Due to the prior information provided by him, the journey towards IITB and getting accommodation there became convenient enough. But, active management of Prof. Belur made the situation easy for us and we were able to get hostel rooms. Four boy students were given two double bed rooms and I, the accompanying faculty, was given a single room at Hostel 3. Two girl students were given a room at Hostel 10. Although accommodation and food was provided free of cost to the boys at Hostel 3 (after Prof. Belur communicated with the Director for the same), but the girls were charged Rs.55 per meal (breakfast, lunch and dinner individually) for each day at Hostel 10 (despite of the email sent to the Hall Manager). Prof. Belur provided us a username and password to access the IITB-Guest wifi connection.

The first memory at IITB includes the hospitality offered at the Hostels there. Although accommodation and food was provided free of cost to the boys at Hostel 3, the girls were charged Rs.55 per meal (breakfast, lunch and dinner individually) for each day. After a day-long journey, we all had dinner and went to bed that night.

The next morning, we gathered at the Control and Computing lab at 10 am where a friendly PhD scholar of IITB, Mr. Chayan Bhawal, briefed the students about the activities they would likely be performing during their stay at IITB. We were to visit various labs, discuss and learn about the active projects in various departments and build contact with the professors there. Our first

experience was demonstration on the various functional parts and working principle of a Quadcopter. Next, we were taken to the Nanomaterials Fabrication Unit where we were shown all the labs and briefed about the various machines there as well as about the different stages of fabrication. From there, we went to the Characterization Lab where all IV measurements are done. There too we were briefed about the working and use of various machines present. After this visit, we went for lunch to Gulmohar Restaurant at IITB itself as we had to complete lunch within a very short duration of time and reaching and returning from hostels would consume a lot of time. After the appetising lunch at Gulmohar, we went to the Communication Lab where Mr. Bhawal along with fellow scholars explained their projects to us one by one. With this discussion, the lab sessions for that day ended and we returned to our respective hostels for the night.

After a day's work at IITB came weekends when we were allowed to move out of the Institute and visit the various tourist spots in Mumbai. We, the students, went to Essel World on Saturday which involved bus and ferry trips to and from Powai. On Sunday, we went to visit The Gateway of India, Taj Mumbai and Marine Drive. A weekend full of fun and thrill ended only to bring in the opportunity to learn and gain hands-on experience that would be difficult to obtain elsewhere. On Monday, the 22nd of December, we visited the Power Systems and Power Electronics Lab where we were shown the working of various machines there and also briefed about the projects that are active in the domain of Photovoltaics. After this, a PhD student gave us all information about the project going on at IITB that is based on open-source softwares. The softwares include Scilab, Python, FreeEDA and many more. We were asked to be a part of this project, called the FOSSEE project. Next, we went to The Electronics Lab where we were given a presentation on the microcontroller and other circuits designed and fabricated at IITB itself. The professor there distributed two such boards and allowed us to bring them with us to Shillong. Once we were done with this lab, we went to the Industrial Design and Structure Lab where we were enlightened about the fantastic blend of design, management and marketing skills. With that ended, Day 2 at IITB.

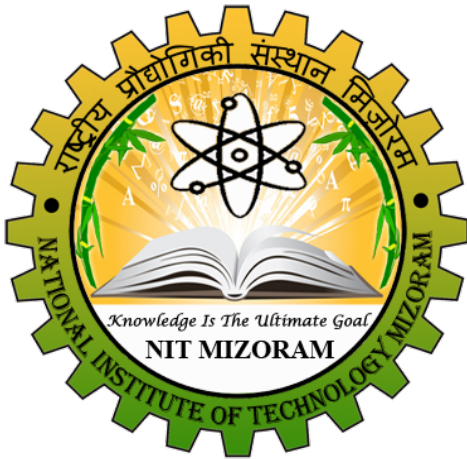


Day 3, that is, the last day of the programme involved our visits to the e-studio and the MOOC lab of CSE Department. There we were briefed about the kind of work and projects going on in the CSE department currently including the EDX project. With this, the entire one week programme came to its end. That evening many of us moved out and roamed close by.

The departure from Mumbai was scheduled on the 24th of Dec which began with the journey from IITB to Mumbai Airport by two cabs. The flight reached Guwahati Airport in the morning and from there, we came to Shillong by a Tourist Sumo.

Thus, to sum it all, the Educational Trip, proved not only beneficial to us but also motivated us to such an extent that we will be working on projects given to us at IITB. The programme stood true to its meaning—‘Northeast Development Programme’. It fetched us exposure to various facets of engineering we were unaware of and provided us the opportunity to personally work under such reputed and dignified professors of IITB. We are all very much thankful to Prof. Madhu Belur of IITB for his active response to all our needs. He mentored us during the whole programme and helped us in all the way despite of having busy schedule. We are also extremely thankful to each and everyone for providing us with such an opportunity and especially to Nabajyoti Sir, without whom this trip would not be as fruitful as it has proved to be.





National Institute of Technology Mizoram

Host: Indian Institute of Technology Madras

Participants:

Vanlalnghaka
Ms. Panchali Das
Bhanu Bhai Richhariya
Ms. Manasi Konar
Prashant Lawhatre
Ms. Tanusri Deb

Faculty

Mr. Goutam Majumder

Throughout this pre-internship program the student of NIT Mizoram was visited laboratories of Computer Science & Engineering and Electrical Engineering department. We also visited the Central library as well as two different centers. The details of all laboratories and what we learn during this program has been discuss below:

LABS VISITED IN COMPUTER SCIENCE DEPARTMENT

Three days session in between 22nd to 24th December 2014 was organized by Computer Science & Engineering department of IIT Madras. During these 3 days session we visited five different laboratories and we also attended two seminars. A complete discussion of all these session has been given below:

1. Artificial Intelligence and Database Lab (AIDB): Dr. Sutanu Chakraborti give an idea on Content Based Reasoning and during this session we got an idea on how new problems can be tackled based on experiences of the past that is by retrieving memory from past experience. This research can be used in many applications like web surfing, content searching etc. thus making complicated things easier. In this lab we also get a chance to meet with Ph.D. and M.S scholars. They discuss about their ongoing projects based on Natural Learning Processing and Semantic Web Technologies.

(a) We understood how surfing and searching any information on web can be more effective and easily accessible using content based and collaborative based filtering techniques.

(b) On semantic web technologies, we understood how any webpage can be simplified according to the user priorities. Also we had an idea how machines can perform more of the tedious work involved in finding, combining, and acting upon information on the web using SWT.

2. Visualization and Perception Lab (VP): Prof. Shukendu Das present one tutorial on different object detection strategies. He also gives a brief idea about how he fined this lab and throughout the year how this lab was developed and what are the different areas on which this lab actually work. We also meet with different scholars and they present their task.

(a) Content Based Image Retrieval – Here we had an idea on how searching an image can be done by enabling reduction in error images. The main focus was on to reduce search query and remove erroneous retrieval.

(b) Computer Graphics – We had an idea using theoretical physics and formula of physics, how deformable graphical images were created.

(c) Face Recognition – We learnt about linear algebra, Geometric model, Probability and statistics, Stock processing, probability and

graph model and optimization. We also came to know that there are mainly two parts i.e. Vision and Graphics. Vision can be classified into Digital image Processing (DIP) and Picture Recognition (PR).

In face Recognition problem we mainly learnt about how a problem image in a probe can be found out from the storage gallery. Also we learnt about the problems in recognizing a problem image. The problems are:

- Beards and Moustache
- Ageing
- Appearances
- Spectacles
- Occlusion-Here the image cannot be recognized as part of the face may be covered with hands or any other object.
- Expression
- Illumination
- Pose- Here the image differs due to the posture or position of the person.
- Blur/ Low resolution of the image.

3. Speech and Vision Lab: In this lab we learnt about how the scholars have developed a way in which one regional language can be translated into an audio output to make it easier for blind people to understand different languages. We also learnt about how any written text can be verbally translated into spoken language that too in different language. We also learnt the technique in which musical notes of Ragas can be differentiated and saw software which were made to make this easier to distinguish and learn.

4.Reconfigurable And Intelligent System Engineering Lab (RISE): In this lab we learnt about the addressing modes application and also about Blue space which have a very strong library and is having a FIFO system already developed within it. It extracts all the low level data. We also came to know about SHAKTI which is a process in collaboration with UBC. We also get information about I-1 BUTTON which is for military use it is a small tablet size cell which have particular information stored within it and can be used for a particular person used. Every cell will be unique. This lab has also undertaken many projects in collaboration with organizations like DRDO.

5. Theoretical Computer Science Group: Here we learnt about the theory based computer science about Linked List, Priority Queue, Data structures etc. We also learnt a method called Cryptography where we can find that in a 6 vertex complete figure



for every coloring edge with red and Black there is always K-Red or K-Black clique. If the figure is having more than 6 sides then there can be one color clique more than the other colored clique.

LABS VISITED IN ELECTRICAL ENGINEERING DEPARTMENT

Another three days session from 26th to 30th December excluding Saturday and Sunday was organized by department of Electrical Engineering of IIT Madras. During this session we also visited laboratories and scholars and lab technician also demonstrate all the instruments and different projects.

1. Measurement and Instrumentation Lab: In this session we are attended by two Ph.D. scholars and they present their task.

(a) Proximity Sensors for Surgical Applications – Detection of metallic sharpeners by designing a miniature inductive proximity sensor. The common approach was to differentiate between a signal sent and that received and to detect the metallic object at a diameter which is considerably more than that of the object. The signal once detected brings a change in the frequency and amplitude of the sent signal. The result so obtained was that for a diametric range of about 5mm, the object got detected at a successful range of 20mm.

(b) Biomedical Instrumentation and Signal Processing Algorithms – A sensor was developed to automatically detect the dimensions of the carotid arteries. It has been found that when the stiffness of the arterial wall is more than the required value at a certain age, risks to coronary heart diseases are more. An algorithm for automatic detection and tracking of the arterial wall locations has been developed to minimize the operator expertise required for measurement.

2. High Voltage Lab: Here we performed some of the experiments on high voltage generation and measurement. The experiment was basically to check the quality of air as an insulating material using two types of electrodes- sphere and rod and sphere and sphere. We found that for both a.c and d.c, with change in the distance between the electrodes the breakdown voltage was different.

3. Photonics Laboratory – In this visit we now about different types of sensors and an optical network works and we also introduced with Ph.D. scholars and with their works.

(a) Cavity Ring down Spectroscopy using Q-switched fiber lasers : Here a new technique that is a the multipulsing phenomenon in Q-switched laser cavities is used to compensate the absorptive losses and the measurement of the ring-up and the ring-down time of the pulses are found to yield a better sensitivity of measurement. The main motive was to overcome certain limitations like poor sensitivity and poor detection range in the current spectroscopy techniques.



(b) Distributed Temperature and Strain Measurement using Stimulated Brillouin Scattering: Here we got an idea of the Brillouin scattering that is scattering of light with acoustic phonons. Also we were shown how splicing that is joining of two optical fibers was done.

(c) A project using micro magnetic simulations was demonstrated to us to predict the dimensions of any ferromagnetic structures that can further help to develop any functional devices.

4. Microelectronics And MEMs Lab – Here we came to know about MEMS that is micro electro mechanical systems that are used in the techniques of micro-fabrication. MEMS is currently finding many applications especially in the medical world. Ex. PRESSURE SENSOR and also in other areas like communication technology. Microelectronics and MEMS Lab is well-equipped for semiconductor device and MEMS fabrication, characterization, modeling and simulation. It has Class-100 and Class-1000 clean rooms which house the major facilities that include a Mask writer, double-sided lithography facility, substrate bond aligner, LPCVD for polysilicon deposition, PECVD for dielectrics, diffusion furnaces, e-beam metallization unit and RIE for dry etching.

CENTRES VISITED

1. Central Electronics Centre: This was one of the most interesting and different things that we visited in our whole trip. We saw how the machines are being repaired by experts and how they are officially maintained. We also saw how light intensity can be measured. We also saw how different control systems can be operated. We came to know about the different types of Solar cells and also Solar panels, how they change their alignment according to the weather change and also according to the direction of sun light.

2. Centre For Innovation (CΦ): This was really an innovative center for all of us where we saw many projects which were made by the IITM students. We saw a robot which can go in any direction or change its orientation and many other complex models of planes which were made by students. We also saw some software based machines which can accurately cut out pieces of wood or plywood into very small pieces with accurate shapes. We were also inspired by the events they organized among the different groups and also within the institute itself.





National Institute of Technology Nagaland

Host: Indian Institute of Technology Delhi

Participants:

Babul Das
Manishankar Kumar
Rajkumar Sharma
Babul Das
Dheeraj Thakur
Nitin Pandey
Priya Kumari

Faculty

Lithungo K Murry

Babul Das

Electronics & Communication Eng., BTech 5th Semester
National Institute of Technology Nagaland

There are lots of things like latest research ,sophisticated technologies,scope of research as a career, to be a good ethical engineer ,various research activities done and how to proceed in research field are the different aspects that have fascinated me through various research scholars and faculty sir during this pre-internship session.The most vital thing to lead life as a engineer is to appreciate each and every things starting from micro to macro and to be motivated in every aspects is the key and motive that I have gained through this scheme.

Meeting the various inter disciplinary research scholars with their research works and works that they have already done quite inspired me because they provide us the hot field in research and the most necessary research field like PMU,Smart Grid, Microgrid etc.that our country is missing or have less in number.

I am quite happy, thanks to PM Modiji that he has provided us the platform which every one needs to excel and show their talents.The timing and durations must be such that vacation shouldn't overlap during the sessions.

Teacher greatly encouraged us through various illustrations of their own teaching and research fields.They have provided us the way of thinking to prosper ourselves and to develop things through our concepts and whatever we grasp during the academic years.

The faculty were very helpful and motivating in bringing thoughts through various research already done like capsule endoscope module(CEM) various electronic devices ,embedded system etc.They allowed us to read the interested fields through various journals in library to actively participate in it.

This course provides us the platform to explore ourselves to be aware of the latest research works ,what the world is missing and what are the things we need to develop to make life comfortable and sustainable for future generations mainly on renewable source of energy.

The faculty greatly inspired us to devote our time for good purposes to do something for the welfare of the people and society and to appreciate every things irrespective of the cost,size and quality.One should choose the subject of his/her own interest and prosper and to be motivated.

Since the resources of latest technologies and research fields are lacking in NE regions .So ,I think this scheme is very helpful to those students who want to develop things and do research works as a career which they cannot do there due to lack of resources.

I think this scheme must be taken up seriously by everyone involved in it and maintaining the dignity and respect of this scheme being launched by the MHRD, Smriti Irani. I am very thankful for launching such scheme. The government must also

launch others scheme which will help not only the technical but also the fields of arts and commerce similarly.

Dheeraj Thakur

Electronics & Communication Eng., BTech 5th Semester
National Institute of Technology Nagaland

I had known the various scopes where I can proceed my future works on research. The important things that I am interested in and had learnt here are the techniques involved in Nano-research field technology, Devices, Fabrication and the role of ethics in engineering passion.

Of all the days, the second day (when I had visited the devices laboratory), I liked it the most. It is so because I had my interest in this field and would like to work in such a lab. I also appreciate the works done by the research scholars in designing the new FET. Hope I will also work in such a lab and perform such works.

I am satisfied by the way this pre-internship has being organized. I would like to mention that without teachers I can't be writing these words as they were the only ones to encourage us and make us think that 'Nothing is Impossible'. The words of Dr. Sen(Dean faculty) is still echoing in my mind as it's the best words which will led me to the smoothed path to follow in the field of engineering. All teachers and research scholars had motivated us in their own way. At last I will always follow the words delivered by Dr. P L Dhar in the role of ethics in engineering passion.

Though it's hard to mention all the names of the research scholars who contributed a vital role in targeting our interest, I would like to appreciate Dr. Joshi's way of interacting with us and he is the one to teach us to think on every small points that could have a large affect in approaching our goals.

The course had taught me to think on ideas, basics, concepts and ethics. I am sure that by following this I will be able to catch my goal. The faculty had inspired us a lot to listen and do what you want to do. It was a good experience to meet the faculties and talk to them.

Ishan Vikas scheme is much better scheme for the students who were not in touch with the institutes like these and had no ideas of the upcoming growth in the technology. Via this scheme all students will come to know there field of interest and pay their contribution to their society and of course the country too.

For me it was a very good experience. Few suggestions are: Let more students from every institute or school to be a part of it. It will be better that students from IITs go to other location and teach the students to use their location in bringing up new and useful things.



Mani Shankar Kumar

Electrical and Electronics Engineering, BTech 5th Semester
National Institute of Technology Nagaland

From day 1 to day 7 there were a lot of things which gave motivation and inspired me. First of all I came to know from the people of IIT Delhi that how they are supportive, hard working and dedicated to their work and it gave me a directional way to do work. Second I knew the various scopes where I can proceed my future works on research. I visited so many labs like simulation, power system, power electronics, NRF, embedded, fabrication etc and knew about where the latest technology is. After taking ideas from faculties and research scholars I decided my area of interest science. I am interested in renewable energy resources so I got a lot of ideas in solar energy system and photo voltaic cell working methodology.

Among all the days meeting with Dean (Faculty) sir Dr. Sen, liked the most. From this session I got the answer of a question I which always makes me scared “WHAT IS THE THING WHICH MAKES A SUCCESSFUL PERSON ALWAYS MOTIVATED AND ENERGETIC”.

I am satisfied by the way this pre-internship has being organized. Time division for different activity was good. as per my suggestion it would be better if this internship is organised in working days so that the ease to access faculty might be improved.

I would like to mention that without teachers I can't be writing these words as they were the only ones to encourage us and make us think that 'Nothing is Impossible'. The words of Dr. Sen (Dean faculty) is still echoing in my mind as it's the best words which will led me to the smoothed path to follow in the field of engineering. All teachers and research scholars had motivated us in their own way. At last I will always follow the words delivered by Dr P L Dhār in the role of ethics in engineering passion.

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Ishan Vikas scheme is much better scheme for the students who were not in touch with the institutes like these and had no ideas of the upcoming growth in the technology. Via this scheme all students will come to know their field of interest and pay their contribution to their society and of course the country too.

It was a very good experience. Few suggestions are:
Student from other institutes which are not so reputed should also be included so that a ray of hope can be put in them also. It can be



done through online also so that more number of students might get benefitted.

Nitin Pandey

Computer Science and Engineering, BTech 5th Semester
National Institute of Technology Nagaland

I learnt about the various perspectives of the research, various scopes which I can further explore. I have learnt that research is not related to only one field. I had visited the Nano-scale Research Facility and various other laboratories where I learnt about how the lithography and fabrication of electrical components are accomplished. Various faculties and scholars delivered the working of the devices and use of these with respect to the research. I met with some research scholars. They explained me their work and what are the scopes in which I can work in future. I also attended a tutorial on engineering ethics which taught me about the ethical issues and moral precepts.

On the second day of the pre-internship I visited the NRF (Nano-scale Research Facility) and I was just amazed to see the devices, experimental setup and the work that the people were performing there. I will also like to mention our meeting with the Prof. Kushal Sen (Dean Faculty) whose ‘words of wisdom’ inspired me so much that I can’t express in words.

Well, I’m satisfied with the way pre-internship is organized. It did teach me something. For suggestions, I can say it would have benefitted more if it was organized in the working days rather than the holidays. As many of the faculties and the research scholars were not there due to holidays and also renovation work was going on in some of the laboratories so we didn’t get the chance to visit them.

Each and every teacher and scholars had their own way of have encouraging. They motivated me to think about the ideas and taught me not to stop whatever be the situation. Dr. Kushal Sen taught me how to remain self-motivated even if the people nearby me are not supporting me. He told me that if I’m doing the right thing no one can stop me. Prof. P.L. Dhar told that whatever we are doing we have to follow code of ethics and moral precepts.

Every time we visited a faculty we get inspired by him/her. They all have a nice way of interacting to the students which keeps students very much interested in listening to them. They taught us in an understandable way so that it will be much easier for us to understand the concepts.

Mostly, this course taught me that we need to have a good understanding of the basic subjects. It also taught me how to approach a problem and to think differently keeping in mind all the perspectives of the problem.

The faculty had inspired us a lot. It was a good experience to meet the faculties and talk to them. It was like if you want to inspire just talk to any faculty with respect to the subject area you



are interested in and he/she will give you as much as possible related to your queries.

Ishan Vikas Scheme is a nice way to give students chance to explore and know about the upcoming technologies and make good use of institutions like IIT's. It will be more useful if students from northeast get more chances to meet the great minds and interact with them.

Well, I had a nice experience. I'm grateful to my teachers by whom I get the chance to be a part of this wonderful scheme. I'm thankful to all the members of this scheme and also to the faculties and scholars of the IIT Delhi to give their precious time to us. I'm also very much thankful to Prof. Sumedha Chakama from IIT Delhi who maintained our schedule and let us explore as much as possible in that limited period of time.

Priya Kumari

Computer Science and Engineering, BTech 5th Semester
National Institute of Technology Nagaland

Though all the things were important, I would like to mention the power system lab that had shown me the scope of various practical things that I can achieve using the knowledge of my computer science branch.

Day 2 when we meet Dean of IIT Delhi, Dr K Sen. His motivation is like filling the whole ocean in a pot and I loved it. Throughout my future works I will remember his words and will always follow it. I would like to thank Dr Sen for his motivation and explaining us the real meaning of engineering.

I am happy by the way this Ishan Vikas scheme is being organized. Teachers were the only ones who motivate me to come at IIT Delhi and think about my future. The teachers and the scholars had helped me a lot in getting my self-confidence and always focus on the target. I had learnt a lot from the teachers and will always appreciate their works.

As already mentioned I won't be here without the faculties encouragement. As Dr Chakma, Dr Sen, Dr. Dhar had shown the path following which I will be able to reach my destination. Visiting IIT Delhi had burned the light in me to focus to my dream more clearly. The course had shown me the fields where I can work in my future thus playing a vital role in my academic life.

The faculties had taught me to take the subject in an ethical manner and related almost the whole field with the subject. Now I know that the main thing to pursue any work is to have self motivation and that's what the faculties had inspired us with.

The relation among teachers and students is like fish and water. I think this scheme helps the fish to swim throughout the ocean. I loved the scheme and I am proud to be a part of it. I am sure I will use the knowledge I gained from here and will contribute my hard works towards research.



Rajkumar Sharma

Electrical and Electronics Engineering, BTech 5th Semester
National Institute of Technology Nagaland

I have learnt that you need to have a knowledge of each and every field which is related to your research topic and you have to appreciate every field of research topics. Even a small thing makes a lot of difference in the way of life and how these small things have helped us to make life easier for one and all. I learned to write journals, to appreciate things around me. I also came to know what are the fields of research for an Electrical and Electronics Engineer. I also came to know what I can do in the future for contributing myself towards the development of the nation.

Day 4(25th Dec, 2014) when we meet the research scholar of power system simulation lab, there we understood what are the fields in which we can focus our aim for future research and what are the problem statements which can be solved by us so that we can work on those problem statements for the good of mankind. I personally liked the topic of micro grid and smart grid and I'm hoping that I will be working on these topics to contribute my idea for a better future. Day 2(23rd Dec, 2014) when we meet the Dean of IIT Delhi, Dr K Sen, there we had an interaction with the Dean of IIT Delhi and he taught us how to become an Engineer from just being an Engineering Student how to look at the problem and how we can find a solution to that problem which is more appropriate which is more economical and how we can differentiate the level of problem difficulty.

I am satisfied by the way this pre-internship was organised. We didn't get much chance of meeting with faculty members as they were not available so maybe a proper appointment with faculty members would surely help for the students coming in for pre-internship in the future.

All teachers and research scholars had motivated us in their own way. Especially Dr. S Chakma, Dr K Sen and Dr. Joshi were the real motivators for us throughout the session, one thing I learned from them that "nothing is impossible" you have to focus on your path with dedication and hard work and at the same time you should learn each and every thing which you come across.

Every time we meet a faculty member we get self-motivated by just looking at them the way they look at the problem statement and the way they approach for the solution makes you think that even you can do impossible things. We learnt something new every time we meet the faculty member and that kept our mind to get involved in such things.

The course had taught me to think on ideas, basics, concepts and ethics. I am sure that by following this I will be able to catch my goal.

Before coming here at IIT Delhi we knew what's inside the books and what is the concept but now I came to know that how those things from the books can be implemented in real life problems to get the appropriate solution and it's all because of the



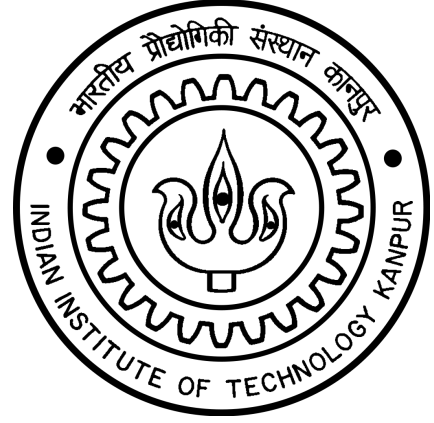
faculty members of IIT Delhi who kept us inspiring to take things to next level.

Ishan Vikas scheme will let the students from northeast to explore and get ideas of what are the things which are going on for making life more easier. Being from northeast side of India students don't get much exposure to outer world but with Ishan Vikas scheme students can explore things, they can learn the basic engineering behind safe and sound environment and then they can contribute towards the people of northeast to make their life more joyous and advanced.

For me it was a very good experience. Few suggestions are:

Let more students from every institute or school to be a part of it. It will be better that students from IITs go to other location and teach the students to use their location in bringing up new and useful things.





Tezpur University

Host: Indian Institute of Technology Kanpur

Participants:

Nabaneeroj Saikia
Karandip Singh
Susmit Boruah
Papori Chutia
Sanjana Talukdar
Khushboo Dhanuka

Faculty

Dr. Dilip Datta

Day-by-Day Diary

Dr. Dilip Datta, Associate Professor & Head, Department of Mechanical Engineering.

19-12-2014

We started our journey from Tezpur University at 05.00hrs and reached Guwahati airport at 09.30hrs. However, our flight from Guwahati to Delhi was delayed by around two hours. As a result, we were late by around 10 minutes to report in the Delhi airport for our next flight to Lucknow from there. Even after repeated request to the Air India authority, neither we could be accommodated in that flight nor could tickets be provided to us for the flight in the next morning. Owing to the several recent cases in Delhi with students from NE India, in particular girl students, the coordinator at IIT Kanpur suggested us to take tickets for the next day in any available flight. They also immediately managed our stay for the night in the IIT Kanpur guest house located in New Delhi.

20-12-2014

The day started from boarding of the flight from Delhi airport which departed at 08.00hrs. We reached Lucknow airport at around 09:30hrs. Then we travelled by cars and reached IIT Kanpur at around 12:00hrs. We were taken to the Visitor's Hostel (Extension), where we got our rooms and after being freshen up we had our lunch.

The programme was scheduled from the morning session. However, due to our delay in reaching, the morning session of the programme was cancelled.

We moved to the SIIC at 14.30hrs, where we were introduced with Prof. B.V. Phani. At the very beginning, we visited the companies under SIIC. Then we had a walk around the campus up to 20.00hrs, which was guided by Shri Rajendra Thapliyal.

21-12-2014

Our programme started at 09.00hrs. The first talk was delivered by Prof. Neelakantan G. on *English Skills for Research*. The second talk was by Prof. Mainak Das on *Recent Trends in Bioengineering*. It was followed by a visit to the Chemistry Research Lab under the guidance of Prof. Basker Sundararaju. There we were introduced to various techniques and instruments used in research, like chemical analysis using TLC, HPLC, GC, RVE, etc. Then we had our lunch.



The afternoon session was started by Prof. Sundararaju, where he talked about extra ordinary chemistry of ordinary things. He also talked about the research opportunities in foreign countries. After that, we visited the Bio-Science and Engineering Lab of Prof. Mainak Das, where we were exposed to various ongoing research works, such as super capacitors, UAV, preparation of FeS₂ and its implications on seeds for their sooner growth. Moreover, we were shown how cocoon can be used as anti-oxidants as well as for production of electricity. As Prof. Das said in his lecture that research is not unidirectional and the nature herself inspires us for this, we observed the same in his lab.

In the evening at around 18.00hrs we went for a city tour and did purchasing of some leather-made items in the Meston road.

22-12-2014

The day started with a theory based talk by Prof. N. N. K. Sharma on *Social Implication of doing research*. It was focussed on motivating us for taking up research as our career. The talk was emphasised on the importance of research, various research works that have influenced the society and how the society recognizes a research work. The next talk was delivered by Prof. Santhanam on *Relevance of Mathematics in Engineering*, where many general mathematical topics were discussed like the physical interpretation of real analysis, linear algebra, matrices, etc.

We were then taken to the ION Beam complex lab, which was a fascinating one. The topics explained mainly included (a) use of 1.7MV HC Tandetron Accelerator for ion implantation and ion irradiation, and (b) use of FIB-Nova Nano Lab 600 dual beam (SEM+FIB) with RGA, EDAX and RAITH for EBL as additional attachments for nano-milling and nano-fabrication.

The second half of the day started with a lecture on *Optical Communication and Network* by Prof. Y. N. Singh. He covered various topics such as the engineering behind optical fibres, primary colours, electromagnetic induction, scalar and vector approaches in magnetic induction.

The day ended with the visit to the Flight Lab and the runway. We were briefed on the types of planes like gliders, high and low wings, and their operational mechanisms. It was followed by display of RC airplanes developed by the Aerospace club of the Institute.

We went for a night walk inside the IIT campus at around 22.30hrs. On the way, we also visited the SAE workshop at around 01.00hrs when some IIT students were fabricating some models



23-12-2014

The day started with the lecture of Prof. Bishakh Bhattachrya on *Intelligent System Design*. The lecture was focused on mimicking nature in the development of efficient engineering systems. He also discussed about various aspects of smart materials. We next visited the 4i lab, which exposed us to four main aspects: reverse engineering, fabrication on PCB, handling CNC machines such as EDM, WCEDM, water jet machining and FDM.

We also had a Paper Craft Workshop by Ms. Nalini, emphasizing on various techniques for making paper crafts using waste papers.

The next lecture by Miss Deborah on *Relevance of sociology and culture* helped us in understanding the basics of sociology and human relationship. Being Miss Deborah as well as we all are from North-East India, the talk was mainly concerned with the issues of that region.

At the end of the day, we were made aware of various aviation opportunities in NE India by the highly encouraging and motivating lecture of Prof. A. K. Ghosh.

24-12-2014

The day started with a lecture by Prof. J. Ramkumar on *Micro-manufacturing* covering the basics of micro-manufacturing and its applications. It was followed by a lecture on *Excitement of nano-materials in engineering* by Prof. Srisiva.

Then we were taken to the *Water Tunnel and Heat Transfer Lab* under the guidance of Prof. A. K. Saha, where he showed us how the velocity of water can be measured using laser techniques, as well as equipment used in the study of heat transfer.

We had a meeting with the Director of IIT Kanpur at 18.00hrs, where we explained about the visit in detail. The Director also suggested us to exploit the facilities of IIT Kanpur in future if we feel so. After that we went for the city visit and did some shopping in Gumti No. 5. On the way, we also tasted some dishes outside the IIT main gate.

25-12-2014

We were expected to leave for Delhi at 06.00hrs by Shatabdi Express and reach Delhi at around 12.00hrs. But due to the delay of the train by about 11 hours, the coordinator at IIT Kanpur managed our travel from Kanpur to Delhi by cars. Further delay or cancellation of the train from Kanpur could have cost heavily as we had a connecting flight on the very next day at 8.15hrs from Delhi to Guwahati. Therefore, we started at 9.00hrs from Kanpur by cars and reached IIT Kanpur guest house situated in Delhi at 23.00hrs. On the way, we visited *Tajmahal* in Agra.



26-12-2014

The day started with boarding of the flight from Delhi, which departed at 08.15hrs and reached Guwahati 10.25hrs. We were expected to reach Tezpur University on the same day. But due to a prevailing *Bandh* call in Assam owing to the killing of many people by NDFB militants, we halt for the day in the IIT Guwahati campus.

Knowing our stay there, the Director of IIT Guwahati called a meeting with us at 18.00hrs where we shared our experiences from the visit.

27-12-2014

We started from IIT Guwahati campus at 9.00hrs and reached Tezpur University at 13.00hrs.

Nabaneeroj Saikia

Bachelor of Technology, 5th Semester
Mechanical Engineering, Tezpur University

Being chosen to be a part of the Ishān Vikās programme held at IIT Kanpur was indeed a great achievement for me. I was pretty excited to visit such a prestigious institute. IIT Kanpur is one of the premier technical institutes in India, which offers both under graduate and post graduate courses in various disciplines.

We started our journey from Tezpur University on 19th December 2014 and reached Kanpur on 20th December 2014. The students' team was accompanied by Dr. Dilip Datta, Head of the Department of Mechanical Engineering, Tezpur University.

The very first thing that fascinated me was the beautiful and lush green campus of IIT Kanpur. During our stay there, we were exposed to various current research topics and ideas, and sophisticated laboratories used in both post graduate and undergraduate levels. The lectures arranged as a part of the programme primarily focused on imparting basic knowledge about different subjects related to engineering, basic sciences and humanities.

The highly motivational speech by Prof. B. V. Phani at the outset of the programme was commendable.

A walk around the campus was organized to help us get familiar with different academic buildings, hostels, and various laboratories.

English speaking and writing skills have always been an important part of any technical course offered in India. It was thus justified to start the programme with a lecture on *English skills for Research* by Prof. Neelakantan G. His lecture inspired me to nurture good communicative skills, which will certainly benefit me in the longer run.

Prof. Mainak Das introduced us to the world of bio-engineering and the recent trends that follow. It was indeed a very interactive and fruitful session, which made me aware of various bio-science and engineering applications in present day world.

Prof. Basker Sundararaju talked about the research trends in the field of chemistry. Besides that, he also introduced us to various courses and research possibilities in abroad.

Prof. Santhanam had a brief discussion about the relevance of mathematics in engineering with special emphasis on topics like real analysis, Fourier transformations, matrices and their transformations, etc. He even guided us regarding how to prepare for national level examinations and prescribed us some books for the same.

The Ion Beam Complex was one of the highlights of the visit to IIT Kanpur. I was highly surprised to see cantilever structures made at nano-level including various thermocouples. Also, the Tandetron Accelerator is worth mentioning.

Besides these, the visit to the 4i lab was another great experience. The sophisticated machines used for metal cutting, machining, 3D printing, and reverse engineering were demonstrated and our queries were responded well.

Prof. A.K. Ghosh introduced us to the aviation research opportunities in and around North-East India. He also encouraged us to apply for summer internships at IIT Kanpur so that we can further benefit.

The lecture by Prof. Bishakh Bhattacharya on *Intelligent System Design* was focused on mimicking nature to build smart and energy efficient engineering systems. He is also collaborating with our accompanying faculty member, Dr. Dilip Datta, on some optimization-based research work. This will provide us with an opportunity to work on various projects involving both the faculty members.

Prof. J. Ramkumar delivered a speech on micro-manufacturing and its applications in modern day world.

Miss Deborah made us aware of the relevance of sociology and culture, and its connection with technical education.

Prof. Srisiva talked about the excitement of nano-materials in engineering and their applications in bio-medical industries.

We finally returned back from Kanpur on 25/12/2014 and reached Tezpur on 27/12/2014.

I am thankful to MHRD for giving importance to NE India and accordingly launching the Ishān Vikās Scheme, which provides a scope to the students of this region to get exposed to the academic environments of IITs. I am also thankful to IIT Guwahati for coordinating the visit and IIT Kanpur for hosting it, as well as Tezpur University for selecting me for the same.



Karandip Singh

Bachelor of Technology, 5th Semester
Computer Science and Engineering, Tezpur University

I am grateful for being selected for the Ishān Vikās scheme introduced by the Ministry of Human Resource Development. The visit to IIT Kanpur, a premier institute of our country, was an inspiring and enriching experience. We were a team of six students from Tezpur University, accompanied by Dr. Dilip Datta, Head of the Department of Mechanical Engineering, Tezpur University.

We started our journey from Tezpur University on 19th December 2014 and reached Kanpur the next day. The IIT Kanpur campus is beautiful and a tranquil place away from the hustle bustle of the Kanpur city. The weather, as in every winter, was very cold.

A five-day schedule prepared for us had various lectures on topics related to engineering, basic sciences and humanities.

We attended lectures on topics like English Skills for Research, Recent Trends in Bioengineering, Social Implication of doing research, Relevance of Mathematics in Engineering, Optical Communication and Network, Intelligent System Design, Relevance of sociology and culture, Aviation Opportunities in NE India, Micromanufacturing, and Excitement of nano-materials in engineering. The lectures were delivered by different faculty members holding expertise on those topics.

Prof. Neelakantan G. explained the importance of English skills in research. He suggested us to develop good English speaking and writing skills.

Prof. Mainak Das talked about the recent trends in the field of bio-engineering. He made us aware regarding bio-science and engineering applications in the present day world.

Prof. N. N. K. Sharma explained the importance of research, research works that have influenced the society, and how the society recognizes a research work.

Prof. Santhanam briefed about the physical interpretation of mathematics, which we use to solve complex engineering problems. He discussed about the physical interpretation of Real Analysis, Linear algebra, matrices, etc.

Prof. Y. N. Singh introduced us to Optical Communication and Network. He covered various topics such as the engineering behind optical fibres, primary colours, electromagnetic induction, and scalar and vector approaches in magnetic induction.

Prof. Bishakh Bhattacharya discussed about the design of intelligent systems and smart materials. He motivated us to take inspiration from the nature in our research and development of efficient engineering systems.

Miss Deborah made us aware of the relevance of sociology and culture, and helped us in understanding the basics of sociology and



human relationship.

Prof. A. K. Ghosh introduced us to the aviation research opportunities in and around NE India. He also encouraged us to apply for summer internships at IIT Kanpur so that we can be benefited by the laboratory facilities available there.

Prof. Sundararaju explained about extraordinary chemistry of ordinary things. He also talked about the research opportunities in some other countries.

Prof. J. Ramkumar briefed on micro-manufacturing and its applications in the modern day world.

Prof. Srisiva talked about the excitement of nano-materials in engineering and their applications in bio-medical industries.

We also had visits to the *Chemistry Research Lab, Bio-Science and Engineering Lab, ION Beam complex lab, Flight Lab, 4i lab, Water Tunnel and Heat Transfer Lab*. We were introduced to the highly sophisticated instruments available in these laboratories. We were also exposed to their ongoing research fields, progress so far, and their future goals.

In the 4i lab, we were exposed to four main aspects: Reverse engineering, Fabrication on PCB, handling CNC machines such as EDM, WCEDM, water jet machining and FDM. In the Flight Lab, we were briefed on the types of planes like gliders, high wing and low wing, and their operational mechanisms. It was followed by the display of RC airplanes developed by the Aerospace club of the institute. In the Chemistry Lab, we were introduced to various techniques and instruments used in research like chemical analysis using TLC, HPLC, GC, RVE, etc. The visit to the ION Beam complex lab was very fascinating. We were shown the use of 1.7 MV HC Tandetron Accelerator for ion-implantation and ion-irradiation, and the FIB-Nova Nano Lab 600 dual beam (SEM +FIB) with RGA, EDAX and RAITH for EBL as additional attachments for nano-milling and nano-fabrication.

Apart from the lectures and lab visits, a Paper Craft Workshop was also organised, where we were exposed to various techniques for making paper crafts using waste papers.

This visit had deeply inspired me to pursue higher studies and make a contribution to the society through research. I would like to visit IIT Kanpur again in future also, if any such opportunity arises.



Susmit Boruah

Bachelor of Technology, 5th Semester
Civil Engineering, Tezpur University

I remember the day when our HOD announced about the Ishān Vikās programme in our class and all of us were tensed about the ongoing viva. I was very happy when I came to know that I was selected and we would be taken to IIT Kanpur. It was my first visit to some Northern city. When I was informed that flight tickets were booked, I was on cloud nine. Coincidentally our departure was on my birthday.

We started our journey from Tezpur University on 19th December 2014 and reached IIT Kanpur on 20th December 2014. The very first thing that fascinated me was the beautiful and lush green campus. The unusual thing that I noticed was the design of the buildings, most of which had few storeys and brickworks.

During our stay at IIT Kanpur, we were exposed to various modern day research topics and ideas, and sophisticated laboratories used in both postgraduate and undergraduate levels. The lectures arranged as a part of the program were primarily focused on imparting basic knowledge about the subjects related to engineering, basic sciences and humanities, and integrating all of them to serve the society.

The highly motivational speech by Prof. B. V. Phani at the outset of the program was commendable. I liked his collection of Apple gadgets.

A walk around the campus was organized to help us get familiar with various academic buildings, hostels, laboratories and recreational areas. We were also taken to Motwani building, which was inaugurated previous day in the memory of Rajeev Motwani. It was one of the beautiful designs I have ever seen. We met some students there who told us about the software-based game they were making.

English speaking and writing skills have always been an important part of any technical course offered in India. It was thus justified to start off the program with a lecture on *English skills for Research* by Prof. Neelakantan G. His lecture inspired me to nurture good communicative skills and write short and meaningful sentences.

Prof. Mainak Das introduced us to the world of bio-engineering and the recent trends that follow. It was indeed a very interactive and fruitful session made me aware of the various bio-science and engineering applications in the present day world and how they are integrated with every discipline of engineering.

Prof. Basker Sundararaju talked about the research trends in the field of chemistry. Besides, he also introduced us to various courses and research possibilities abroad such as the Erasmus Mundus.



Prof. Santhanam had a brief discussion about the relevance of mathematics in engineering with special emphasis on topics like real analysis, Fourier transforms, matrices and their transformations, etc. He even guided us regarding how to prepare for national level examinations and prescribed us some books also.

The Ion Beam Complex was one of the highlights of the visit to IIT Kanpur. I was highly surprised to see various cantilever structures made at the nano-level including various thermocouples. Also the Tandetron Accelerator is worth mentioning.

Besides these, the visit to the 4i lab was another great experience. The sophisticated machines used for metals cutting, machining, 3D printing and reverse engineering were demonstrated, and our queries were responded well.

Prof. A. K. Ghosh introduced us to the aviation research opportunities in and around North East India. He also encouraged us to apply for summer internships at IIT Kanpur so that we can further benefit.

Lecture by Prof. Bishakh Bhattacharya on *Intelligent System Design* was focused on mimicking nature to build smart and energy efficient engineering systems. He is also collaborating with our accompanying faculty member, Dr. Dilip Datta. This may provide us with an opportunity to work on various projects involving both the faculty members.

Prof. J. Ramkumar delivered a speech on micro-manufacturing and its applications in the modern day world. Miss Deborah made us aware of the relevance of sociology and culture, and its connection with technical education. Prof. Srisiva talked about the excitement of nano-materials in engineering and its applications in bio-medical industries. We finally returned back from Kanpur on 25th December and reached Tezpur on 27th December.

I would like to acknowledge MHRD for giving importance to NE India and accordingly launching the Ishān Vikās scheme, which would provide a scope to students of this region to get exposed to the academic environments of IITs and recent trends in research. I believe that more number of our friends should be benefited. I am also thankful to IIT Guwahati for coordinating the visit and IIT Kanpur for hosting it, as well as Tezpur University for selecting me for the same.



Papori Chutia

Bachelor of Technology, 5th Semester
Food Engineering and Technology, Tezpur University

It was a great achievement for me being a part of the Ishān Vikās Programme of MHRD. Under the Programme, six students of our institute were selected to visit IIT Kanpur, accompanied by Dr. Dilip Datta, Head of the Department of Mechanical Engineering.

IIT Kanpur is one of the premier institutes in India, which offers UG, PG and PhD programmes in different disciplines. All of us learned many things during the visit, which have motivated us for higher studies. The beautiful green campus of IIT Kanpur and its infrastructure fascinated me.

As a part of the programme a series of lectures was arranged related to basic science, engineering and technology along with humanities. During the programme, we were exposed to different recent research topics along with various sophisticated instruments and laboratories, which are available in limited institutes and laboratories.

We started our journey from Tezpur University on 19th December 2014 and reached Kanpur on 20th December 2014. At the very beginning, Prof. B. V. Phani, Associate Dean, R&D, presented a highly motivational speech about innovation and entrepreneurship. After that, a walk around the campus was organized, which helped us to get familiar with different academic buildings, hostels etc.

The first lecture on 21st December was delivered by Prof. Neelakanthan G. As students of engineering, English speaking and technical writing are very important for all of us. Sir talked about English skills for research; how to avoid wordiness and unnecessary parts, structures of sentences used in technical writing, etc. After that, Prof. Mainak Das delivered a very interactive speech about recent trends in Bioengineering, which really fascinated me. Prof. Das talked how nature inspires human for developing new technologies including how bioscience and bioengineering can be combined with different branches of engineering. It was followed by a visit to the chemistry research laboratory. There were many instruments used for food analysis.

In the afternoon session, Prof. Basker Sundararaju introduced the research trends in chemistry as well as research opportunities in foreign countries. Bioscience and Bioengineering laboratory was one of the excellent laboratories we have visited. As a student of food engineering and technology, I appreciated the Department of Bioscience and Bioengineering of IIT Kanpur.

In the next day, Prof. N.N.K. Sharma delivered a theory-based talk on social implication of doing research, which motivated us for doing research. Sir told the importance of doing research and its impact on the society. Prof. Santhanam discussed the relevance of mathematics in engineering. In the ion beam complex, we learnt the working principles of Focused Ion Beam tool and Tandem Accelerator.

In the next session, Prof Y.N. Singh talked about optical communication and network. It was followed by the visit to the flight laboratory, which was amazing.

On 23rd December, the first lecture was about intelligent system design delivered by Prof. Bishakh Bhattacharya. Sir mentioned how scientists get inspiration from nature for designing



intelligent systems. Prof A.K. Ghosh introduced the aviation research opportunities in North East. We also had a paper craft workshop, where Ms. Nalini showed how waste paper materials can be used for making eco-friendly paper crafts.

In the evening session, Miss Deborah talked about the relevance of sociology and culture, and its connection to the technical education. After that, we were taken to the 4i laboratory (4i stands for innovation, incubation, implementation and integration). It was one of the highlighted laboratories in IIT Kanpur.

On 24th December, Prof. J. Ramkumar talked on micro-manufacturing and how miniaturization has changed today's world. Prof. Srisiva talked about the excitement of nanomaterials in engineering and in their applications in biomedical industries.

We visited the water tunnel and the heat transfer laboratory in the evening session under the guidance of Prof. A.K. Saha. The UG level heat transfer laboratory contains various equipment for heat transfer about which we have been taught in our curriculum.

We returned back from Kanpur on 25th December and reached Tezpur on 27th December.

Finally, I am thankful to MHRD for launching the Ishān Vikās scheme for the students of North East India. The scheme provided a scope to the students of this backward region to get exposure to the academic environments of IITs as well as motivated for higher studies. I am also thankful to IIT Guwahati for coordinating the programme and IIT Kanpur for hosting it, as well as Tezpur University for selecting me for the same. After joining the programme, we came to know the importance and scopes for higher studies, specially the programme encouraged me for taking research as a career.

Sanjana Talukdar

Bachelor of Technology, 5th Semester
Mechanical Engineering, Tezpur University



The visit to IIT Kanpur, one of the best institutes in India, was under the Ishān Vikās Scheme of MHRD, Govt. of India, which aimed at inspiring students for higher studies.

There were six students selected to visit IIT Kanpur from Tezpur University. I was overjoyed for being selected as one of the students. Dr. Dilip Datta, Head of the Department of Mechanical Engineering, Tezpur University, accompanied us.

We started our journey on 19th December 2014 from Tezpur University and reached IIT Kanpur on the next day. On the first day, we visited the SIIC (SIDBI Innovation and Incubation Centre) companies and walked around the campus. The campus is beautiful and clean with an amazing scenic beauty.

The Programme that was organised at IIT Kanpur under the Ishān Vikās Scheme comprised of lectures by different faculty and staff members, and visit to different laboratories. The programme started with an enthusiastic speech from Prof. B.V. Phani.

There were talks on topics such as *Recent trends in Bioengineering* and *Intelligent System Design*, which focused on Nature and how she can influence humans in developing new technologies and improving the existing ones.

There was a lecture on *Relevance of Mathematics in Engineering*, where Prof. Santhanam explained some basic topics like Fourier series, Linear Algebra, and Real Analysis, in a very simple way. We could understand how these techniques would be useful in solving challenging Engineering problems.

A lecture on *Micro-Manufacturing*, given by Prof. J. Ramkumar, emphasised on miniaturization, its classification, importance and different miniaturization manufacturing processes.

There was a lecture on *Excitement of Nanomaterials in Engineering*, where Prof. Srisiva explained us about Nanomaterials and their importance in present scenario and how they can benefit the society in future.

Prof. A. K. Ghosh talked about *Aviation Research opportunities in North-East*. He also encouraged us to visit IIT Kanpur again under Summer Internship Programme.

Prof. Neelakantan G. delivered a lecture on the topic *English Skills for Research*, where he spoke about correct use of English while writing and speaking.

There were other lectures also, like *Extraordinary chemistry of ordinary things*, *Optical Communication and Network*, *Social Implication of doing Research* and *Relevance of sociology and culture*. In addition, a paper craft workshop was also organised for us, where Ms. Nalini showed us how eco-friendly jewellery can be made from old magazines. It was very new and refreshing.

We visited several laboratories including Chemistry Research lab, Bio-Science and Engineering lab, Ion Beam Complex, Flight lab, 4i- lab, Heat Transfer lab and water tunnel. In each lab, we were explained about various equipment, instruments, machines, and experimental set ups and their applications.

We finally returned from IIT Kanpur on 25th December 2014 and reached Tezpur University on 27th December 2014.

The whole Ishān Vikās Programme was a learning experience for me. It has given me an idea about different emerging areas of research. The motivating talks given by different Professors inspired me for higher studies. Our accompanying faculty member, Dr. Dilip Datta, is working with Prof. Bishakh Bhattacharya of IIT Kanpur on an ongoing research project under Prof. Bhattacharya. This will provide us an



opportunity to work on the project involving the faculty members of the two premier Institutes.

Lastly, I want to thank IIT Kanpur for hosting the Programme, IIT Guwahati for coordinating it and Tezpur University for selecting me, thus giving me an opportunity to be a part of this Programme.

Khushboo Dhanuka

Bachelor of Technology, 5th Semester
Electronics and Communication Engineering,
Tezpur University

The visit to IIT Kanpur, one of the best Institutes in India, was under the Ishān Vikās Scheme of MHRD, Govt. of India. It aimed at exposing the North-East India students to various ongoing research projects and thus to inspire them for higher studies.

I was informed by our HOD that I got selected for the programme. It was a great achievement for me and I was quite excited as it was my first visit to an IIT. We were a team of six students from different departments accompanied by Dr. Dilip Datta, who visited IIT Kanpur from Tezpur University.

We started our journey on 19th December from Guwahati and reached IIT Kanpur on 20th December. We were accommodated in the Visitor's House Extension.

The whole schedule of the programme was planned in a very effective manner keeping in mind that we students were from different backgrounds. The programme comprised of lectures from different faculty members and other supporting staff members of the Institute and visit to different laboratories.

The highly motivational speech by Prof. B. V. Phani at the outset of the programme was commendable.

A walk around the campus was organized to help us get familiar with different academic buildings, hostels, and various laboratories. I found the campus very beautiful, serene and a quite peaceful one.

English speaking and writing skills have always been an important part of any technical course offered in India. It was thus justified to start the programme with a lecture on *English skills for Research* by Prof. Neelakantan G. His lecture inspired me to nurture good communicative skills, which will certainly benefit me in longer run.

Prof. Mainak Das introduced us to the world of *bio-engineering and the recent trends that follow*. It was indeed a very interactive and fruitful session, which made me aware of various bio-science and engineering applications in the present day world.



Prof. Basker Sundararaju talked about the *research trends in the field of chemistry*. Besides that, he also introduced us to various courses and research possibilities in abroad.

Prof. Santhanam had a brief discussion about the *relevance of mathematics in engineering* with special emphasis on topics like real analysis, Fourier transformations, matrices and their transformations, etc. He even guided us regarding how to prepare for national level examinations and prescribed us some books for the same.

Prof. A. K. Ghosh introduced us to the *aviation research opportunities in and around North-East India*. He also encouraged us to apply for summer internships at IIT Kanpur so that we can further benefit.

The lecture by Prof. Bishakh Bhattacharya on *intelligent system design* was focused on mimicking nature to build smart and energy efficient engineering systems.

Prof. J. Ramkumar delivered a speech on *micro-manufacturing* and its applications in the modern day world.

Miss Deborah made us aware of *the relevance of sociology and culture*, and its connection with technical education.

Prof. Srisiva talked about the excitement of *nano-materials in engineering* and their applications in bio-medical industries.

Prof Y. N. Singh talked about *optical communication and network*. He covered various topics such as the engineering behind optical fibres, primary colours, electromagnetic induction, scalar and vector approaches in magnetic induction.

We were made to visit the Chemistry Research lab, Bio-Science and Engineering lab, Ion Beam Complex, Flight lab, 4i-lab, Heat Transfer lab and water tunnel. In each lab, we were explained about the respective research projects going on and the experimental setups used. I was quite fascinated by some of the research topics as they were completely out of my imagination. These laboratories were used for both postgraduate and undergraduate levels.

The Ion Beam Complex was one of the highlights of the visit to IIT Kanpur. I was highly surprised to see cantilever structures made at nano-level including various thermocouples. Also, the Tandetron Accelerator is worth mentioning.

Besides these, the visit to the 4i-lab was another great experience. The sophisticated machines used for metal cutting, machining, 3D printing, and reverse engineering were demonstrated and our queries were responded well.

In order to break the continuous chain of scientific topics, a paper craft workshop was organised for us, where Ms. Nalini showed us how eco-friendly jewellery can be made out of magazines. It was a quite interesting one and in fact I have started practising it after coming back home during my free time.



The chilling cold in Kanpur was my first experience, but the programme was so captivating that it did not allowed the cold to divert our mind. In spite of the busy schedule, we took out some time and had a visit to the city also. On our journey from Kanpur to Delhi, we even visited the Taj Mahal at Agra.

Finally, after this wonderful trip we returned to Tezpur University on 27th December.

It was a life changing experience for me as I might never get a chance to get exposed to the basics of other branches of engineering as I got here. This programme also focussed on imparting basic knowledge on sciences and humanities. Moreover, the talks of various faculty members made me clear that our study or research is not concentrated to a particular topic or field only. It is omnidirectional; we can contribute to other fields too very effectively if we have a strong determination and will power.

The whole Ishān Vikās programme made me learn various lessons which will be helpful for me throughout my life. The infrastructure at IIT Kanpur and lectures delivered by its various faculty members and other supporting staff members have inspired me for higher studies and make contribution to the society through research work. I want to have a visit to other IITs and such other educational organisations if any opportunity arises. I am also determined to work harder and try to pursue my higher studies in an IIT.

Our accompanying faculty member, Dr. Dilip Datta is working with Professor Bishakh Bhattacharya of IIT Kanpur on a research project. Thus, it will provide us with an opportunity to work on the project involving both the faculty members of the two premier Institutes.

Lastly, I want to thank MHRD for this scheme, IIT Kanpur for hosting the programme, IIT Guwahati for coordinating it and Tezpur University for selecting me, thus giving me an opportunity to be a part of it. I also personally want to thank Dr. Dilip Datta for accompanying us and guiding us so well.



Dilip Datta

Associate Professor and Head
Department of Mechanical Engineering, Tezpur University

Being having exposure to many premier Technical Institutes of the country as well as in abroad, I can realize the need of policies like the Ishān Vikās Scheme - recently launched by MHRD with the aim of encouraging technical students of NE India towards higher studies and research by familiarizing them in advance with the academic environments and research activities of various IITs. Due to the insufficient industry-based local organizations, the Technical Institutes of NE India suffer from proper Industry-Institute interactions as well as industry-based research and consultancy. Being in a remote corner of the country, these

Institutes fail even to attract quality faculty members. As a result, technical programmes in these Institutes are to be run as textbook-oriented curricula without much practical consideration and research activity.

I personally feel that the Ishān Vikās scheme can be considered as a successful mission even if a small portion of the students, trained under the scheme, get motivated for higher studies and serve the NE region latter on. With that expectation only, in spite of running through a busy schedule of the departmental headship, I immediately accepted the request of the Dean, School of Engineering, Tezpur University, to accompany a team of our six students to IIT Kanpur for one week.

We started from Tezpur University in the early morning of 19th December 2014 and reached IIT Kanpur on the next day after a night halt in the IIT Kanpur Guest House located in New Delhi. The programme was started from the afternoon of 20th December and continued up to the evening of 24th December. Finally, we left IIT Kanpur in the early morning of 25th December and reached Tezpur University on 27th December after a night halt on 25th December in the IIT Kanpur Guest House located in New Delhi and another night halt on 26th December in the Guest House of IIT Guwahati.

At IIT Kanpur, the students were given rigorous training through a series of lectures on recent research trends, followed by visits to relevant laboratories and research works. Taking into account the distinct background of each student, the entire programme was concentrated on multi-disciplinary discussion only. Elaborating me every evening the activity of the day, the students used to express their excitement on new learning, which otherwise also I could read from their faces. As told me at the end of the programme, upon visiting various facilities and attending the encouraging lectures, all the six students have been highly motivated for pursuing higher studies and carrying over research work.

I feel that a visit to a new place is incomplete without some leisure to know the locality, apart from performing the pre-scheduled activities. Being an alumnus of IIT Kanpur, the Kanpur city is well known to me. So, managing little time after the day-long schedule of the programme, I took the students once to the Meston road for shopping leather-made items and once to Gumti No.5 for doing garments shopping. They were also taken outside the IIT main-gate for tasting some local dishes. To show the well-known night work-culture at IIT Kanpur, the students were taken also for a mid-night campus walk piercing thick fog of the coolest month of December. They were also allowed to visit the Tajmahal at Agra during the return journey by cars from Kanpur to Delhi on 25th December.

It was incredible to the students when I informed that Prof. Indranil Manna, Director of IIT Kanpur, had fixed a meeting with them in the last evening of the visit. The meeting was very much



friendly, where the students could share their experiences with the Director without any reservation. They requested the Director also to extend them other possibilities for revisiting IIT Kanpur.

Due to some disturbances in Assam, during the return journey we had to halt in IIT Guwahati Guest House on 26th December. Upon listening about our unplanned stay there, Prof. Gautam Biswas, Director of IIT Guwahati, immediately called a meeting with us. This meeting was also very friendly. Apart from discussing the experiences of the students under the Ishān Vikās programme, Prof. Biswas also shared his experiences in IIT Kanpur where he served for quite a long time.

Not only the students, I was also benefitted from the visit. I also attended some lectures and visited different laboratories with the students. Presently I am involved in a collaborative research work with Prof. Bishakh Bhattacharya from the Department of Mechanical Engineering of IIT Kanpur. I could have a face-to-face discussion with him about the present work, as well as we discussed about a new work in near future. Dr. J. Ramkumar, Associate Professor in Mechanical Engineering and a member of the coordinating team of hosting the Ishān Vikās programme at IIT Kanpur, extended me an open offer for research collaboration involving two students from the visiting team.

According to me, the visit was very beneficial to all of us from every aspect, except the traveling. Due to the severe foggy weather in the Northern India, our flight from Guwahati to Delhi on 19th December was delayed by around two hours, causing us to be late by around 10 minutes in reporting for the connecting flight from Delhi to Lucknow on that day. Even after repeated request to the concerned Air India officers in the Delhi airport, neither we could manage our travel to Lucknow by that flight nor by any other Air India flight on the next day. Then, as per the suggestion from IIT Kanpur over telecom, we stayed the night in the IIT Kanpur Guest House located in New Delhi and travelled to Lucknow next morning by an IndiGo flight on spot booking. The return journey was also a horrible one. After we reached the Kanpur railway station in the early morning of 25th December to ride the Shatabdi Express for Delhi at 06.00AM, directly 11 hour delay of the train was announced. Considering the possibility of missing our flight from Delhi to Guwahati in the next morning if the train was further delayed or cancelled in the worst case, the coordinating team at IIT Kanpur immediately sent us to Delhi by hiring two cars.

Finally, after discussing with the students upon completion of the visit, I have the following major observations:

1. All the students liked and greatly benefited from the visit under the Ishān Vikās Scheme.
2. For greater interest and need of NE India, more number of students may be trained under the scheme.



3. The visit may be conducted for a longer period of around two weeks.
4. In order to avoid travelling inconvenience in winter, visits may be arranged during summer vacation.
5. Announcement about a visit may be made in well advance enabling students to get train tickets.

