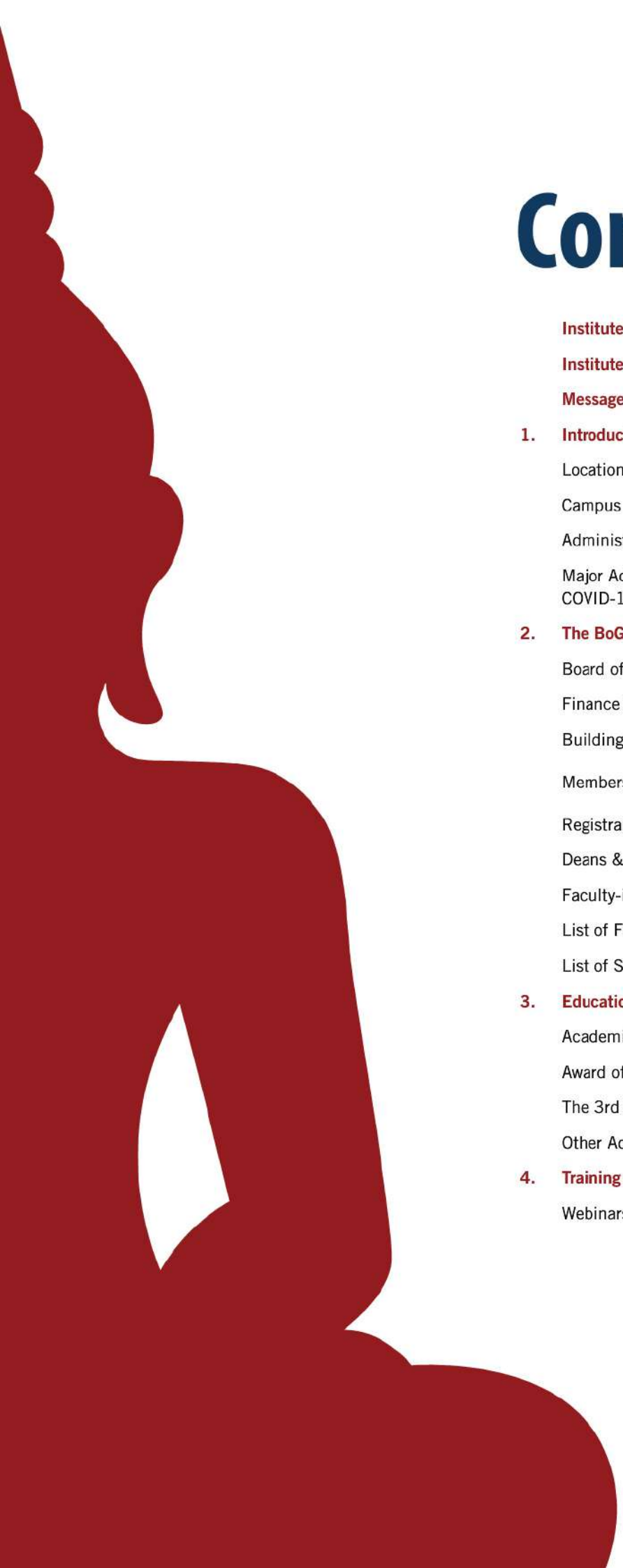
# Annual Report
2020-2021

National Institute of Technology Sikkim
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम

## Postal Address:

National Institute of Technology Sikkim
Ravangla, South Sikkim
Sikkim, India - 737139
Telephone: +91 7479013180



# Contents

# Institute's Vision

India has the capability and the responsibility to offer the World Science & Technology essentially with sustainability, through philosophy, conscience and value system. NIT Sikkim will play its role.

# Institute's Mission

To develop the students as 'Thinking Engineers' by nurturing them in attaining and enjoying the technical and scientific excellence, global exposure and at the same time in beholding the philosophy and the values for India and the world as a whole.

# Message from the Director

*Technology will never replace great teachers, but technology in the hands of great teachers can be transformational.*

- George Couros

It gives me immense pleasure to present the annual report for the year FY 2020-21, which highlights the glimpses of efforts and achievements of the Institute. I am really happy to note that despite the challenges raised by the global Covid-19 pandemic, the Institute Marched towards its vision with much vigor and enthusiasm to establish a niche for itself among the institutes of national importance. Institute community has been very adaptive to the sudden changes due to massacre created by the Novel Corona Virus and has continued with its academic activities with innovative e-learning mechanisms. The challenges were taken in a positive spirit and space of opportunities to unlearn and re-learn new things to impart quality education even during the troubled times. The Institute has also been proactive in countering Covid-19 pandemic. I am happy to share with utmost pride that the Institute was able to cater the needs of its stakeholders during this testing time, despite operating from a temporary campus.

On the academic front, NIT Sikkim continued to run various B.Tech., M. Tech., M.Sc., and Ph.D. programs, and stressed upon imparting research-based holistic education. The students' admissions have increased

considerably in the past few years and presently, 960 students are pursuing their courses at NIT Sikkim. The Institute is continuously striving towards creating world leaders out of the students completing the courses and is proving all possible supports for entrepreneurial and managerial developments of the students. We are in a process of signing MoUs with leading academic institutions of the country to foster innovation and outreach.

The placement of the Institute saw a steady growth from the previous years. With 72.86% placement and 100% internships, the Institute witnessed its best-ever statistics. The Institute has been successful in getting its students placed at notch organizations.

Most notable this year has been the significant R&D activities of the Institute. The Institute has seen a steady growth in the number of publications in reputed journals/ conferences and externally funded projects. At present, several sponsored research projects funded by DST, DEITY, ICCSR, etc., are being carried out by the faculty members. The Institute has organised various national and international workshops funded by external agencies aiming to create capable human resources.

Being a public funded education and research Institution, the Institute is mandated to connect with all stakeholders at various levels. The government has stressed upon galvanizing this connection between the Institute and its stakeholders, the institute has responded proactively to make this happen at all possible levels. The Institute has actively participated in various schemes, programmes and Societal initiatives of the government which aims to improve the all-inclusive development of the students, connectivity with all stakeholders and help realizing the dream of Aatma Nirbhar Bharat.

In the newly introduced National Education Policy (NEP-2020), paramount importance has been given to foster quality of education, innovation, creativity and research in emerging multidisciplinary areas having societal/ environmental values. Several societal challenges that the country needs to address include (but not limited to) access for all its citizens to clean drinking water and sanitation, quality IT/digital infrastructure, improved transportation, air quality and energy. NEP 2020 has mandated the higher learning institution to integrate technology and science and promote high-quality interdisciplinary research across fields. NIT Sikkim is committed to work holistically towards the realization of the objectives outlined in NEP-2020. Various committees comprising of the faculty/staff members of the Institute are currently formulating action points/ road maps for smooth implementation of the policy. In this regard, New academic facilities such as smart classroom, laboratories, internet connectivity, etc. have been created to ensure quality of education. The Institute has initiated the process to set up a 'Centre of Excellence' to foster innovative research activities in emerging multidisciplinary areas having societal/technological/environmental values in areas such as artificial intelligence (AI), machine learning (ML), health, environment, energy etc. Moreover, the Institute has also initiated the process of implementing other key academic reforms suggested in NEP-2020, such as 'Multiple Entry-Exit', 'Academic Bank of Credit', 'Internationalization', 'Promotion of Indian art & culture' etc.

While there is much to be done to create NIT Sikkim a world class centre of learning, I am confident that we are on the right track to creating sound foundation and strongly believe that with active participations from its stakeholders, the Institute will scale new heights in years to come. I take this opportunity to thank Ministry of Education (MoE) and the Board of Governors for their constant support, guidance and suggestions. I would also like to thank the faculty and staff members of the Institute for always being supportive to the activities/ initiatives taken.

With profound regards,

Jai Hind

**Prof. Mahesh Chandra Govil**
Director, NIT Sikkim

# Introduction

Sikkim exists as an exotic North-Eastern state in the abode of Eastern Himalayas. Founded in the 17th century as the Buddhist Kingdom by Nyingma lamas, the school of Tibetan Buddhism, Sikkim undoubtedly takes pride in its rich and unique cultural heritage.

During its inception, it was populated by the Bhutias who migrated from Tibet as well as the Lepchas who were the original inhabitants of Sikkim and who are also described as "one of the most primitive communities of the world". The etymological name of Sikkim is derived from two Limbu words: Su meaning 'new' and Khyim meaning 'palace' or 'house'. Today, Sikkim has earned international acclaim and recognition by becoming the first 100% Organic State in the world. Earning the title of "Organic State" and being internationally acclaimed has certainly brought laurels to the country. Sikkim added more feathers to its glory as it surpassed 50 other nominated policies to win the Gold Award for its State Policy on Organic Farming (2004) and Sikkim Organic Mission (2010), enabling it to become the first 100% Organic State in the world. The endeavor to win recognition by keeping alive the traditional unique methods of farming in compatibility with the modern mechanism of farming is indeed commendable. Organic farming is considered the agricultural system closest to the traditional Sikkimese way of farming, which is rain-fed with low external inputs and in complete apathy to the use of chemicals.

The splendor and diversity of Sikkim's art, literature, rituals, culture, and dance are distinct and unique in its kind. The word Sikkim perhaps connotes a mystic land of diverse culture and multifarious ethnic communities existing in oneness and peace owing to its identical cognitive development grounded on their rich cultural heritage. Nepali is the lingua franca of the state, but different communities speak different languages. Sikkim has eleven official languages viz, Nepali, Bhutia, Lepcha, Tamang, Limbu, Newari, Rai, Gurung, Mangar, Sunwar and English. The predominant religions are Hinduism and Buddhism, however, there are people who also follow Christianity, Islam, and Jainism. The Lepchas consider Munism as their traditional religion, which coexists with Buddhism and Christianity. Perhaps, Sikkim, fulfils the concept of unity in diversity by looking beyond the petty rituals of cultural disparity as it embraces the innate primary consciousness of its unique culture and tradition.

Sikkim remained a kingdom for a long time and the protectorate state of India before its merger in 1975 as the 22nd State. The Government of India has ventured to foster innovation and creativity in North-Eastern States of India. Hence, the Government of India took an important decision to establish such institutions in this region along with other States of India. NIT Sikkim is an outcome of such endeavor that aims to impart quality technical education to students by providing world class infrastructure and advanced pedagogical tools.

The National Institute of Technology (NIT) Sikkim is a foremost educational Institution catering to the needs of high-quality technical education in the state of Sikkim. It is one among the ten newly sanctioned National Institutes of Technology by the Government of India by an Act of the Parliament as a part of the 11th Five-year Plan in the year 2010. The objective of this establishment is to impart technical education of excellence and quality and also to foster research and development activities in the field of Science and Technology in order to produce quality human resources. The Government of India has accorded the status of an "Institution of National Importance" keeping in view its role in developing human resources of highest skill and caliber in the field of Science and Technology. Governed by the NIT Council, the Institute has four statutory bodies, namely, the Board of Governors, the Finance Committee, the Building and Works Committee and the Senate. The Institute is fully funded by MoE, the Government of India, New Delhi. The Institute enjoys the full financial and academic autonomy.

Since its inception in August 2010, the institute is operating from a temporary campus, situated at Ravangla, South Sikkim. Despite various challenges of an extreme climate, poor transport, small space of the campus and many more to count; the Institute has been able to mitigate the teething problems and has progressed slowly but steadily in its pursuit of academic excellence. The Institute believes that rural development is essential for balanced development of the nation; in this view the Institute makes every possible effort to enable unhindered exchange of knowledge as well as the benefit of Science and Technology to the poor and underprivileged. The Faculty Members, Staff and Students are engaged in extending help to other academic institutions across the state by being actively involved in social developmental activities. A remarkable feature

of the institute is its endeavor to bestow a sense of societal responsibility and belongingness to the people associated with it. This has paved the way to a slew of initiatives by the Students, Faculty Members and Staff of NIT Sikkim for transforming the underprivileged into sound, empowered souls of the Nation.

National Institute of Technology Sikkim started its journey with three (3) Undergraduate Programs in Computer Science & Engineering, Electronics & Communication Engineering, and Electrical & Electronics Engineering with intake of thirty (30) students each. Presently around thousand (1000) students are enrolled in NIT Sikkim. The Institute offers Undergraduate Programs in Civil Engineering, Computer Science & Engineering, Electrical & Electronics Engineering, Electronics & Communication Engineering, and Mechanical Engineering. The Postgraduate Programs are offered in Computer Sciences & Engineering, Electrical Engineering, Microelectronics & VLSI Design and Chemistry. The Institute also offers Ph.D. Programs in all Engineering disciplines, Basic Sciences and Humanities.

The Institute believes in the holistic development of Students as they are empowered with an insight on inculcating a strong inclination towards co-curricular and extra-curricular activities like technical, cultural, literary and sports events. Under the guidance and able leadership of Staff and Faculty Members, events like Abhiyantran – the Annual Technical Event, Udgam– the Annual Cultural Event and the Annual Sports have been organized. Such events abound in a plethora of talents by the young and energetic students of the institute as it tries to accomplish the growth of new ideas in the field of Science and Technology amidst an atmosphere of learning through innovation. An exhibition is held during the technical event where the students display prototype working models. Several workshops on emerging technologies and seminars by experts from industry and academia are organized during the event and otherwise. NIT Sikkim empowers the youth of the country through education and encourages them to participate in the holistic development of the nation which is the absolute necessity of the time.

As an institute of higher learning, along with imparting technical knowledge, the Institute instills moral values so that the graduating students become good citizens and good human beings benefitting the society and the nation. It is interesting to note how the cultural diversity and traditional and religious heterogeneity of the state could exert an impact on developing the intellectual capacity of the learners. Embracing such diversities of culture and tradition could lead to the germination of ideas of innovation and excellence and could also sharpen their intellect through a holistic development. Students at the institute have displayed such growth as they have adapted to the physical environment of Sikkim with its extremities of weather conditions and diversity in culture. The Institute justifies the meaning of complete learning by developing an aptitude of living in amity with new surroundings. Besides, its cultural diversity exposes them to the world of flora and fauna and gradually trains their mind to appreciate nature and acknowledge its value which is a great need for this generation of students. In the fast-changing world of technology and rapid modernization, it is but commendable to develop in students a judgment of living with and not without our rich biodiversity. Along with the learning programs offered, the Institute thus offers a platform to the students to recognize and protect nature, breaking the myth of technical institutes in not catering to such needs of preservation of nature and biodiversity.

# Location

Sikkim is an ever-enchanting state with its elegant natural beauty of snowing mountains, luxuriant forests with exotic flora and fauna, pristine waterfalls, sacred lakes, holy caves, medicinal hot springs and gentle streams. The snowcapped greenery with accessible mist and clouds magnifies the spectacular beauty of the place. It boasts of the third highest mountain in the world - Mt. Khanchendzonga which is also revered as the Guardian Deity of Sikkim. NIT Sikkim, since its inception in the year 2010, has been functioning from a temporary campus which is situated at Ravangla in South Sikkim.

Ravangla or Rawangla or Ravongla is a small town situated at an elevation of eight thousand (8000) ft in South Sikkim district of the Indian state of Sikkim. It witnesses The Himalayan or high mountain type of climate where the weather fluctuates with altitude as well as snow and ice in the elevated areas. Ravangla witnesses' snowfalls during winter which can dip the temperature to sub-zero levels. The serene, tiny semi-urban agglomeration is situated at 80 kms from Gangtok, the capital city of Sikkim. The small town has been widely acclaimed for the construction of one hundred and thirty (130) feet high statue of Lord Gautam Buddha at 'Buddha Park'.

The nearest railway station from the campus is New Jalpaiguri Railway Station, West Bengal which is approximately one hundred and eighteen (118) kms away from the campus. Air connectivity is available from Bagdogra Airport which is approximately one hundred and thirty-two (132) kms away from the Campus. The Institute has been successfully carrying out academic and research activities from the temporary campus confronting various obstacles placed by its physiography and other factors.

# Campus

National Institute of Technology Sikkim at Ravangla is based on a campus that initially served as a 'Residing Camp for Tibetan Refugees.' This Refugee Camp posed several teething challenges in getting transformed into a campus of an 'Institute of National importance'. However, the Institute has carved a niche by establishing a name and reputation despite the limited resources that it had to make use of. Overpowering such hurdles of limited resources and hardships of space and environment through strong determination and reformative measures to enhance its aura and growth, NIT Sikkim is definitely an inspiration.

NIT Sikkim has invested arduous efforts to renovate existing structures to instructional buildings, administrative blocks, hostels, residence for Faculty and Staff etc. by compromising the size of each building so as to accommodate different branches of learning within the limited space. It is to be noted that due to the locational disadvantages, poor infrastructural facilities and minimum required living amenities in the campus and in Ravangla town such as improper housing facility, lack of medical facility, schools, and other basic essential services, retention of Faculty and Staff is a huge challenge before the Institute administration. The numbers of Faculty and Staff leaving the Institute have been increasing over the years, however, in last few years the institute has been trying hard to retain good Faculty and Staff in the Institute by providing some basic living facilities knowing well that even it would not be as per even the minimum standards.

The Institute, within its limited campus area, is equipped with outdoor playgrounds, medical unit, and gymnasium for boys and girls along with other obligatory establishments. The campus, at present, accommodates sixteen three-storied blocks, each with sixty two small room apartments, totaling to ninety-six apartments which are utilized as Boys' hostels, Girls' hostels, and Faculty and Staff apartments and as various departments and offices. All the hostels are equipped with geysers for providing warm water to the inmates.

A separate well-built Academic Building consisting of Classrooms, Computer Laboratory, Faculty Rooms and the Office of the Dean Student Welfare and the Dean Academic finds place within the campus. The first ever supercomputer in Sikkim "Param Kanchenjunga" is also situated in the Academic Building. Besides, the Training and Placement Cell of the Institute is also housed in the same Academic Block. However, the Supercomputer Center is now old and need up-gradation. The classrooms are now converted into smart classrooms and are equipped with room heaters and projectors.

The Administrative Building of the Institute is recently renovated and houses the Director's Office and Secretariat, the Registrar Office, Office of the Dean Administration, Accounts Section, Conference / Meeting Room, Examination Cell and a Pantry Room. Adjacent to the Administrative Building a Central Store and offices of Junior Engineer Civil and Electrical is now fully functional.

To cater to the number of enrolled students, two Prefabricated buildings were constructed as Hostels and are being efficiently used as Boarding for approximately three hundred forty students. However, due to the increase of student intake, NIT Sikkim fails to accommodate all the students within its campus and therefore, the Institute has hired several well-constructed and semi-furnished buildings in the Ravangla town and are using them as Hostels.

The Institute in previous years was unable to provide even the basic Laboratory facilities compelling the students to travel to distant educational institutions for completing their Laboratory Courses. As Laboratories are the crux of the curricula of any technical institution, the Institute has created sheds and is able to increase the build-up space in the temporary campus to mitigate the problem of paucity of space for Laboratory facilities and classrooms. But, considering the all-around rapid growth and to meet the desire of the Ministry to diversify the branches and departments of the Institute, these temporary arrangements are still inadequate. The temporary campus hinders the growth of the Institute. The establishment of the permanent campus for the Institute is the only viable solution to solve these long pending issues. A permanent campus with state-of-the-art facilities and World Class Infrastructure will not only take the Institute to new heights but also will aid in human-capital formation and steer our students to world leaders.

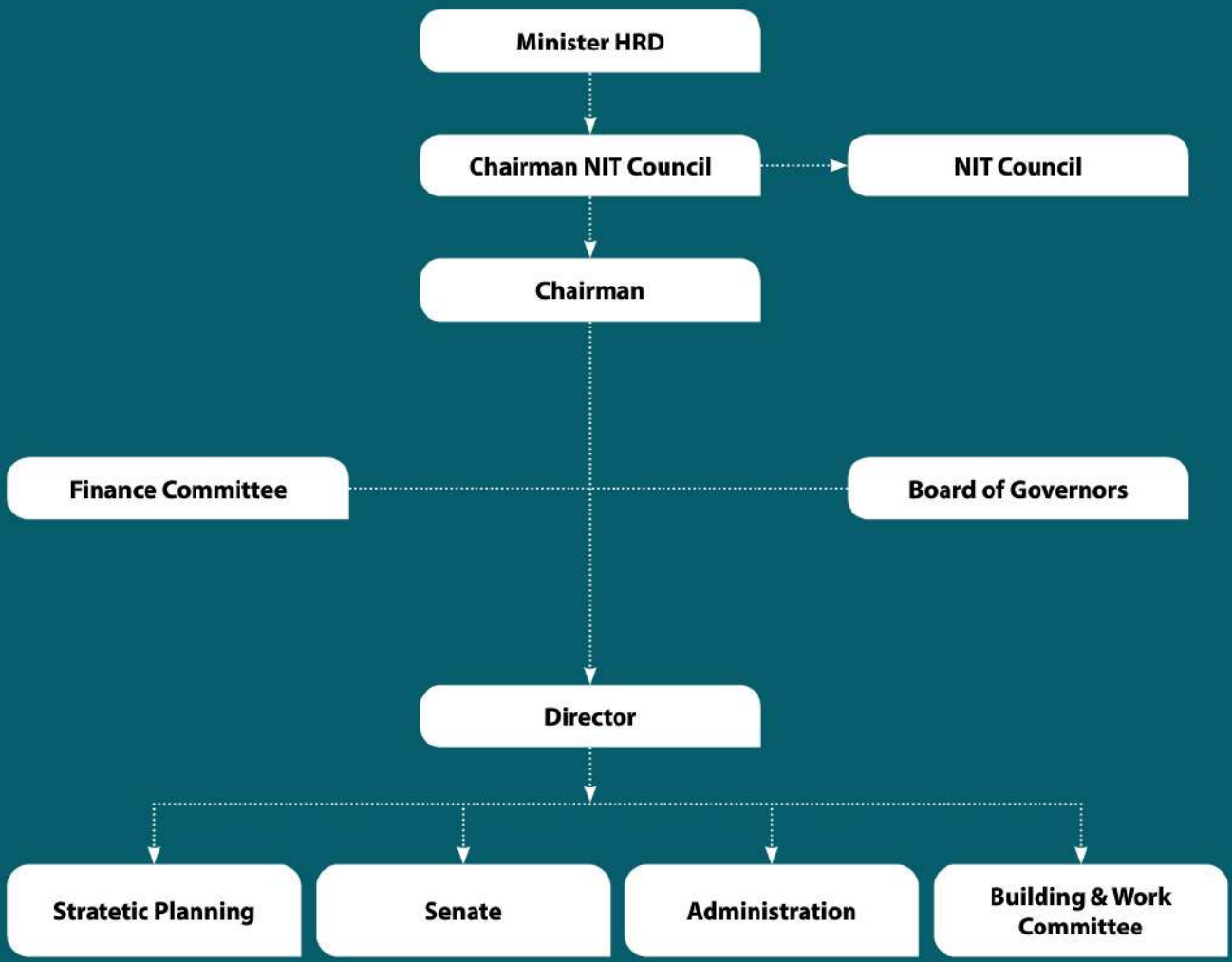
The Government of Sikkim has assured allocation of 100 acres of land for construction of the permanent campus of NIT Sikkim at Dung Dung Block, Khamdong, East Sikkim. The Additional Chief Secretary of Government of Sikkim has given his consent through a letter of approval for acquisition of the land that was received on 12th December 2019 by the Institute. The Institute awaits the physical attainment of the land so that the Institute can deliver more to the Technical Education and contribute to the development of the country with full caliber which the present temporary campus prohibits to undertake. However, strenuous efforts are made to provide adequate facilities for students to maintain the quality of learning.

The town of Ravangla is located at a distance of just 2.5 kms from the campus. Though the town offers essential utilities and services such as Banks, Post Offices and a Primary Health Centre but being a small town, it has limited amenities and Health Care facilities. The Institute is housed at a picturesque location with abundance of natural and scenic beauty. Kanchenjunga, Mt. Pandim, Mt. Siniolchu, Mt. Kabru are just a few of the major peaks that are clearly visible from Ravangla. The climate at this place is severe and extremely varied largely due to the variation in altitude. Moreover, the remote location and inadequate infrastructure pose huge challenges to the management of the Institute through its temporary campus.

# Administration

NIT Sikkim is an autonomous institution under the Government of India since 2010. As per NITSER Act 2007, the institute is headed by a Director and administered by a Board of Governors. In the Board, there are representatives from the Government of India, the Government of Sikkim, industries, other institutions and the faculties. Director is the Principal Academic and Executive Officer of the Institute. He is assisted in his day-to-day work by Deans, Heads of the different Departments, Professor-in-Charges, Registrar and other officers and various committees of the Institute.

## Administrative Hierarchy of NIT Sikkim




The Institute provides certain opportunity to students to administer their own affairs affecting the co-curricular residential and recreational activities through various committees, such as Institute Canteen Committee, Student's Aid Welfare Committee, Hostels and Mess Committee etc.

# Major Administrative Initiatives during the COVID-19 pandemic

The COVID-19 virus (pandemic) which was first sighted in Wuhan-China quickly spread across the globe, spawning a lamentable period in the daily lives of people in India and the World. To curb the spreading of the Novel Coronavirus, various preventive measures were taken by the Government of India like social distancing, wearing of masks, and finally nation-wide lockdowns. Wherefore, dynamically affecting the daily lives, health, industries, commerce, economy, and the structure of educational system in the country. In fact, the entire teaching - learning, research and assessment methodologies have seen a massive transformation.

# Measures initiated by the MoE during the COVID-19 pandemic

Ministry of Education has taken many initiatives to ensure the COVID-19 appropriate behavior during the pandemic by educating the public about COVID-19 appropriate behaviour viz. the appropriate way of wearing masks, washing hands, social distancing, physical distancing, and other related information through YouTube, All India Radio, Doordarshan, and Government Websites etc. as noted below.

- PM eVIDYA, which unifies all efforts related to digital / online / on-air education to enable multi-mode access to education
- DIKSHA (Digital Infrastructure for Knowledge Sharing)
- Access to education through TV Channels- Swayam Prabha TV Channels
- Swayam MOOCs for Open Schools and Pre-service Education
- Extensive use of Radio, Community Radio, and Podcasts
- One DTH Channel is being operated specifically for hearing impaired students in sign language. For visually and hearing-impaired students, study material has been developed in Digitally Accessible Information System (DAISY) and in sign language; both are available on the NIOS Website / YouTube
- E-textbooks were prepared and circulated
- National Repository of Open Educational Resources (NROER)
- MANODARPAN a portal for psychosocial support was launched by the Minister of Education.

# COVID-19 related Initiatives at NIT Sikkim

The higher education system of the country is not an exception to the prevailing circumstances; in fact, it is one of the worst hit systems during the pandemic. These situations arising out of the pandemic have not only disrupted the normal functioning of the Institutions of Higher Learning but also infused doubts in the mind of students about their future and their job credibility with the Corporates and Industries. However, NIT Sikkim has remained unwavering and uncompromising with its vision to play a pivotal role in the advancement of the country by imparting quality education. Hence, NIT Sikkim has assumed an adaptive and transformative role to undertake the challenges faced by the education system during the pandemic. Some major initiatives which were taken by NIT Sikkim to counter the pandemic and to ensure a COVID-19 free future, are detailed under:

Post-March 2020 lockdown, Central Government started implementing measures to limit the number of people congregating in public places. These measures have disrupted the normal functioning of every Educational Institution in the country. However, NIT Sikkim has been taking all necessary measures to contain the spreading of the pandemic in the country; and to uphold the true values of an Institution of Higher Learning; therefore, with the approval of the Competent Authority, the Institute started operating in an online mode, ensuring all the academic and research activities of the Institute does not get effected.

- Amid the surge of the pandemic in the country, the Students were instructed to vacate the hostel and were assisted by their respective Faculty In-Charge, Wardens, and Staff Members during their transit from the Institute campus to their home.
- In compliance with the guidelines of UGC and MoE, a Covid-Cell was established to handle the student grievances related to examination and academic activities during the pandemic. The members of the Grievance Cell are given below.

| | |
|---|---|
| Dean Academics | Chairman |
| Dean Student Welfare | Member |
| Associate Dean Academics | Member |
| All Heads of the Department | Member |

- The Institute employees made generous donations to the COVID Relief Fund(s) to help the nation combat the COVID-19 pandemic. Details are given below:

  PM-Cares Fund - Rs. 2,45,485/- (Rupees Two lakhs forty-five thousand, four hundred and eighty-five only)

  CM Fund – Rs. 4,51,000 (Rupees Four Lakhs, fifty-one thousand only)

- The Training and Placement activates of the Institute were continued unabated through various online platform. Almost all Internships offered to the 3rd Year B.Tech and Final Year M.Tech Students were converted into Online Internship with a very few exceptions like the Internships of Mechanical and Civil Engineering students. The Institute happily informs that none of the recruiters has withdrawn any job offers offered to the students owing to the Pandemic.
- Because of the countrywide lockdown, the Faculty and Staff members were instructed to work from home.
- An Online Reporting and Admission process for 1st year B.Tech. and M. Tech. Program for the Academic Session 2020-21 has been completed and Online Classes commenced from 1st December 2020.
- Mentor-Mentee Counseling System was implemented to help students adapt to the Online Mode of Learning.
- The Academic Calendar for the 1st Semester B.Tech Program was immediately modified and subsequently approved by the Senate, owing to the onslaught of the pandemic.
- With the approval of the BoG, Hostel Fees were fully waived off for all Students for the EVEN Semester 2020-21 and only the Institute Fee was charged.
- •The Registration Fee for the Students having backlog subjects were also fully waived off for EVEN Semester (January-June 2020-21) considering the hardship faced by the Students in the pandemic situation.
- Considering the relatively poor IT Infrastructure in villages to which most of the students belong, Faculty Members were also asked to share the lecture notes, assignments, Video Recordings of Live Online Classes, etc. Students were also encouraged to use NPTEL, NDL, INFLIBNET, MOOCS, etc.
- The evaluation for most of the Laboratory Courses was completed using MoE Virtual Laboratory.
- The 3rd Convocation of the Institute was held on 7th December 2020 in an Online Mode. Various Medals and Degrees were awarded to B. Tech 2018 & 2019, M. Tech. 2018 & 2019, M.Sc. 2019 Pass Out Students. Further, three (03) Ph.D. Degrees were also awarded during the Convocation.

- The Institute organized several Faculty Development Programs / Workshops / Short Term Courses / Webinars, details of which are given by the Department.
- Following the COVID-19 appropriate standards, the Institute organized all its statutory meetings in an Online Mode viz. Board of Governors, Finance Committee, Building and Work Committee Meetings, etc.
- The Institute worked on strategies to conduct the Placement Drives in Online Mode to minimize the impact of the pandemic on the career prospects of the students. Details of the same may be found at the Placement Section.
- The Institute with the help of all the stakeholder's prompt support and effective foresight, does not have any COVID-19 case as on date. The Institute is also elated to report that Academic and Research related activities were not hampered due to the transition to an Online Mode on Teaching–Learning System.

# The BoG and Other Administrative Committees

## Board of Governors

**Prof. Mahesh Chandra Govil**
Director, NIT Sikkim
Ex-officio Member-cum
Chairman (I/c)
Ravangla, South Sikkim 737139
Email: director@nitsikkim.ac.in
govilmc@gmail.com

**Shri G. P. Upadhyaya, IAS**
Member
Additional Chief Secretary
HRDD, Govt. of Sikkim
Email: gpupadhyaya@gmail.com

**Shri Ugyen Chopel**
Member
State nominee
Email: ugyenchopel@gmail.com

**Prof. Chandan Mahanta**
Member
Dean Student Affairs
IIT Guwahati, Assam
Email: chandan@iitg.ernet.in

**Dr. Dhananjay Tripathi**
Member
Assistant Professor
Department of Humanities & Social Science, NIT Sikkim
Ravangla, South Sikkim 737139
Email: dhananjaystripathi9@nitsikkim.ac.in

**Dr. Ranjan Basak**
Member
Assistant Professor
Department of Mechanical Engineering, NIT Sikkim
Ravangla, South Sikkim 737139
Email: basakranjan@nitsikkim.ac.in

**Joint Secretary** or his/her Nominee, Government of India
Member
Department of Secondary & Higher Education, MHRD Shastri Bhavan,
New Delhi – 110 001
Email: nit.edu@nic.in

**Joint Secretary** &
Financial Advisor
Member
Department of Secondary & Higher Education, MHRD, Shastri Bhawan,
New Delhi – 110 001
Email: jsfa.edu@gov.in

**Dr. Achintesh Narayan Biswas**
Secretary
Registrar (I/c) & Secretary
NIT Sikkim, Ravangla,
South Sikkim 737139
Email: registrar@nitsikkim.ac.in

# Finance Committee

**Prof. Mahesh Chandra Govil**
Director, NIT Sikkim
Ex-officio Member-cum Chairman
Email: director@nitsikkim.ac.in
govilmc@gmail.com

**Shri G.P. Upadhyaya, IAS**
BoG Nominee,
Additional Chief Secretary
HRDD, Govt. of Sikkim
Email: gpupadhyaya@gmail.com

**Dr. Dhananjay Tripathi**
BoG Nominee, Assistant Professor, Department of Humanities & Social Science
Email: dhananjaystripathi9@nitsikkim.ac.in

**Joint Secretary** or his/her Nominee, Government of India
Department of Secondary & Higher Education, MHRD, Shastri Bhawan, New Delhi – 110 001Email: nit.edu@nic.in

**Joint Secretary** and Financial Advisor, Department of Secondary and Higher Education, MHRD, Shastri Bhawan, New Delhi – 110 001
Email: jsfa.edu@gov.in

**Dr. Achintesh Narayan Biswas**
Registrar (I/c) & Secretary,
NIT Sikkim
Ravangla, South Sikkim
737139
Email: registrar@nitsikkim.ac.in

# Building and Works Committee

**Prof. Mahesh Chandra Govil**
Director, NIT Sikkim
Ex-officio Member-cum Chairman
Email: director@nitsikkim.ac.in

**Shri Manish Kumar Jindal**
Chief Executive Officer (CEO), NABET
Email: manishjindal.hsbte@gmail.com

**Shri Raj Kamal Mittal**
Director (Trg. & Co-ord),
College of Military Engineering, Pune
Email: rkmittal123@gmail.com

**Shri Rodan Thapa**
Chief Engineer, Energy & Power Department, Government of Sikkim, Expert in Electrical Engineering from State Government (nominated by BoG)
Email: rodanthapa@gmail.com

**Dr. Aurobinda Panda**
Dean Planning and Development, NIT Sikkim
Email: dpd@nitsikkim.ac.in

**Dr. Achintesh Narayan Biswas**
Registrar (I/c) & Secretary,
NIT Sikkim
Ravangla, South Sikkim
737139
Email: registrar@nitsikkim.ac.in

# Members of the Senate

| | | |
|---|---|---|
| **A** | **Director** | |
| | **Prof. Mahesh Chandra Govil**<br>Director, NIT Sikkim, Ex-officio Chairman | Chairman |
| **B** | **External Members** | |
| | **Prof. Adrijit Goswami**<br>Department of Mathematics, IIT Kharagpur | Member |
| | **Prof. Supriya Agarwal**<br>Department of English, Central University of Rajasthan | Member |
| | **Prof. Lalit Kumar Awasthi**<br>Director, NIT Jalandhar | Member |
| | **Prof. Virendra Singh**<br>Department of Electrical Engineering, IIT Bombay | Member |
| **C** | **All HoDs & Deans**, NIT Sikkim | Member |
| **D** | **Dr. Achintesh Narayan Biswas**<br>Registrar (I/c), NIT Sikkim | Secretary |

# Registrar

**Dr. Achintesh Narayan Biswas**
Registrar (I/c) & Secretary
NIT Sikkim, Ravangla, South Sikkim 737139
Email: registrar@nitsikkim.ac.in

# DEANs & HoDs

| | |
|---|---|
| • Dean Academic | Dr. Ranjan Basak |
| • Dean Administration | Dr. Achintesh Narayan Biswas |
| • Dean Faculty Welfare | Dr. Md. Nurujjaman |
| • Dean Student Welfare | Dr. Sangram Ray |
| • Dean Research & Consultancy | Dr. Anjan Kumar Ray |
| • Dean Planning & Development | Dr. Aurobinda Panda |
| • Associate Dean Academic | Dr. Anindya Biswas |
| • Associate Dean Student Welfare | Dr. Surajit Kundu |
| • HoD Computer Science and Engineering | Dr. Pratyay Kuila |
| • HoD Electronics and Communication Engineering | Dr. Sanjay Kumar Jana |
| • HoD Electrical and Electronics Engineering | Dr. Sourav Mallick |
| • HoD Mechanical Engineering | Dr. Shambhunath Barman |
| • HoD Civil Engineering | Dr. Anindya Biswas |
| • HoD Mathematics | Dr. Om Prakash |
| • HoD Physics | Dr. Anindya Biswas |
| • HoD Chemistry | Dr. Taraknath Kundu |
| • HoD Humanities and Social Sciences | Dr. Dhananjay Tripathi |

# Faculty-in-Charges (FICs)

| | |
|---|---|
| • Alumni Affairs & Resource Generation | Mr. Md. Sarfaraj Alam Ansari |
| • Information and Communication Technology Infrastructure | Dr. Pratyay Kuila |
| • Knowledge, Information and Learning Enablement | Dr. Ranjan Basak |
| • Library | Dr. Anjan Kumar Ray |
| • Controller In-charge Examination | Dr. Sourav Mallick |
| • Landscaping, Gardening and Environmental Protection | Mr. Neelanjan Dutta |
| • Publications and Web Information System | Dr. Dhananjay Tripathi |
| • Chairperson Women Grievance Cell | Ms. Gopa Bhaumik |
| • Games, Sports and Cultural Activities | Dr. Ravi Srivastava |
| • Promotion of Indian Language & Culture | Dr. Dhananjay Tripathi |
| • Training and Placement Activities | Dr. Dhananjay Tripathi |
| • Health Care Services | Dr. Surajit Kundu |
| • Chairperson Innovation Cell | Dr. Anjan Kumar Ray |
| • SC/ST Cell Chairperson | Ms. Gopa Bhaumik |
| • Store & Purchase Activities | Dr. Taraknath Kundu |
| • Vehicle and Transport Management Activities | Dr. Sourav Mallick |
| • Community Development and Awareness Program | Dr. Shambhunath Barman |
| • Construction and Maintenance Activities | Mr. Debashish Roy |
| • Power and Energy Conservation Initiative | Dr. Pradeep Kumar |

# Faculty and Staff Details

The Institute has highly qualified, dedicated and well-trained Faculty of academic repute with proven capabilities. More than 90% of the Faculty possesses Ph.D. / D.Phil Degree in various disciplines. The Institute is gradually becoming a premier center of technical learning in the North-East region by attracting young minds from across the country. Student intake has increased considerably during the last few years and according to the existing norms laid down by the Ministry, NITs should maintain a Student-Faculty ratio of 12:1. As per the present student intake at NIT Sikkim (960 excluding the Ph.D. Students), the total number of Faculty Members should be eighty (80). At present, only 38 Faculty positions have been sanctioned by the MoE and 26 Faculty positions are filled leading to the present Student-Faculty ratio which is 37:1.

In order to meet the minimum requirement of Students-Faculty ratio at least 42 additional Faculty positions are to be sanctioned by the Ministry of Education. Due to the general lack of facilities in the temporary campus, the Institute is facing problems in recruitment as well as retention of the Faculty. It is to note that several Faculty Members have already resigned due to poor facilities and other location specific disadvantages such as improper housing facility, lack of medical facility, schools, and other basic essential services. The recruitment of additional Faculty Members is envisaged to solve the problem of Faculty shortage. Despite these unavoidable glitches the Institute has invested its efforts in imparting quality education and therefore, considering the growth of the Institute and further expansion into a permanent settlement (that the Institute is highly hopeful to attain this year), sanction of additional Faculty posts is highly desired. Several requests to sanction additional Faculty positions have been sent to the Ministry of Education, Government of India, so that the Institute can function properly.

| Cadre | Sanctioned Post as per Four-Tier flexible Cadre norms | Imposition Faculty |
|---|---|---|
| Assistant Professor | 22 | 26 |
| Associate Professor | 11 | 00 |
| Professor | 05 | 00 |
| **Total** | **38** | **26** |

# List of Faculty Members

| Sl. No. | Name | Department |
|---|---|---|
| 1 | Prof. Mahesh Chandra Govil | Computer Science & Engineering |
| 2 | Dr. Sangram Ray | |
| 3 | Dr. Pratyay Kuila | |
| 4 | Mr. Md. Sarfaraj Alam Ansari | |
| 5 | Ms. Gopa Bhaumik | |
| 6 | Mr. Banavath Balaji Naik | |
| 7 | Mr. Tarun Biswas | |
| 8 | Mr. Pankaj Kumar Keserwani | |
| 9 | Dr. Sanjay Kumar Jana | Electronics & Communication Engineering |
| 10 | Dr. Hemant Kumar Kathania | |
| 11 | Dr. Surajit Kundu | |
| 12 | Ms. Reshmi Dhara | |
| 13 | Dr. Anjan Kumar Ray | Electrical & Electronics Engineering |
| 14 | Dr. Sourav Mallick | |
| 15 | Dr. Aurobinda Panda | |
| 16 | Dr. Pradeep Kumar | |
| 17 | Dr. Molay Roy | |
| 18 | Dr. Shambhunath Barman | Mechanical Engineering |
| 19 | Dr. Ranjan Basak | |
| 20 | Dr. Ravi Srivastava | Mathematics |
| 21 | Dr. Om Prakash | |
| 22 | Dr. Md. Nurujjaman | Physics |
| 23 | Dr. Anindya Biswas | |
| 24 | Dr. Taraknath Kundu | Chemistry |
| 25 | Dr. Achintesh Narayan Biswas | |
| 26 | Dr. Sumit Saha | |
| 27 | Dr. Dhananjay Tripathi | Humanities & Social Sciences |

Moreover, as the infrastructure of the Institute and the number of activities in both Academics and Administration have increased significantly, working with temporary / ad-hoc staffs in the Officer's Cadre may invite several challenges in future and hamper the proper functioning of the Institute. The Institute lacks a proper set-up due to insufficient number of Staffs. It makes even the important sections like Accounts, Establishment, Academics, Store and Purchase etc. to suffer. Therefore, to ensure proper functioning of the Institute, the Institute has sent repeated requests to the Ministry of Education, Government of India, to sanction at least Fifty-one (51) additional Non-Teaching positions as detailed below. The present sanctioned strength is only thirty-seven (37).

| Sl. No. | Cadre | Post Sanctioned |
|---|---|---|
| 1 | Registrar | 01 |
| 2 | Deputy Registrar | 00 |
| 3 | Assistant Registrar | 01 |
| 4 | Librarian | 00 |
| 5 | Deputy Librarian | 00 |
| 6 | Assistant Librarian | 01 |
| 7 | Senior Students Activity & Sports Officer / Assistant Engineer | 00 |
| 8 | Students Activity & Sports Officer | 00 |
| 9 | Scientific Officer / Technical Officer | 01 |
| 10 | Executive Engineer | 01 |
| 11 | Medical Officer | 00 |
| 12 | Technical Assistant / Junior Engineer / SAS Assistant / Nurse | 09 |

| Sl. No. | Cadre | Post Sanctioned |
|---|---|---|
| 13 | Superintendent / Accountant | 03 |
| 14 | Personal Assistant | 00 |
| 15 | Technician / Laboratory Assistant / Work Assistant | 10 |
| 16 | Senior Technician | 00 |
| 17 | Senior Assistant | 00 |
| 18 | Junior Assistant | 05 |
| 19 | Stenographer | 01 |
| 20 | Pharmacist | 00 |
| 21 | Multi-Tasking Staff | 04 |
| | **Total** | **37** |

# List of Staff Members

| Sl. No. | Name | Designation |
|---|---|---|
| 1 | Mr. Bapi Mondal | Junior Assistant, Director Office |
| 2 | Mr. Ram Prasad Nepal | Assistant Registrar |
| 3 | Mrs. Nishita Chettri | Junior Assistant, Registrar / Estab. Office |
| 4 | Mr. Bharat Pradhan | Junior Assistant, Accounts Section |
| 5 | Mr. Rahul Kumar Byahut | Accountant |
| 6 | Miss. Chandra Kumari Rai | Accountant |
| 7 | Ms. Tshering Zangmo Bhutia | Junior Assistant, DIC (SW) |
| 8 | Ms. Sonam Choden Tamang | MTS, DIC(AA) |
| 9 | Mrs. Punam Singh | MTS, FICMA Office |
| 10 | Mrs. Chandrama Majumdar | Lab Assistant, CHEM |
| 11 | Mr. Tapan Chhetri | Lab Technician, CSE |
| 12 | Mr. Amit Tamang | Technical Assistant, ECE |
| 13 | Mr. Sidharth Pradhan | Lab Assistant, ECE |
| 14 | Ms. Deepika Chettri | Technical Assistant, EEE |
| 15 | Mr. Manish Kumar | Lab Technician, EEE |
| 16 | Mr. Amit Maity | Technician, ME |
| 17 | Mr. Bhaskar Bhattarai | JE/TA (CE) |
| 18 | Mr. Rewa Nath Sharma | JE/TA (CE) |
| 19 | Mr. Amrit Sharma | JE (Electrical) |
| 20 | Ms. Chanda Moktan | Technician, CE |
| 21 | Mr. Subho Das | Technical Assistant, CE |
| 22 | Ms. Saheli Saha | JE, CIVIL |
| 23 | Mr. Suman Pathak | Lab Assistant, CHEM |
| 24 | Mr. Happy Mondal | Lab Assistant, PHY |

# Educational System


1 000 000,-

# 1. Academic Programs

The Institute offers Four-year Undergraduate Programs leading to the Bachelor of Technology (B.Tech.) Degree in five disciplines, Two years Full-time Postgraduate Programs in specialized areas in the field of Engineering and Science leading to the Master of Technology (M. Tech.) and Master of Science (M.Sc.) Degrees. Similarly, Full-time / Part-time Research Programs leading to Ph.D. Degree in the areas of Engineering / Technology / Sciences / Humanities and Social Sciences are also offered.

## Table-1: Department wise Programs offered

| Sl. No. | Departments | UG Programs | PG Programs | Ph.D. Programs |
|---|---|---|---|---|
| 1 | Civil Engineering | B. Tech. in Civil Engineering | | |
| 2 | Computer Science & Engineering | B. Tech. in Computer Science & Engineering | M. Tech. in Computer Science & Engineering | Ph.D. in Computer Science & Engineering |
| 3 | Electronics & Communication Engineering | B. Tech. in Electronics and Communication Engineering | M. Tech. in Microelectronics and VLSI Design | Ph.D. in Electronics & Communication Engineering |
| 4 | Electrical and Electronics Engineering | B. Tech. in Electrical and Electronics Engineering | M. Tech. in Electrical Engineering (Control, Power and Electric Drives) | Ph.D. in Electrical and Electronics Engineering |
| 5 | Mechanical Engineering | B. Tech. in Mechanical Engineering | | Ph.D. in Mechanical Engineering |
| 6 | Chemistry | | M.Sc. in Chemistry | Ph.D. in Chemistry |
| 7 | Mathematics | | | Ph.D. in Mathematics |
| 8 | Physics | | | Ph.D. in Physics |
| 9 | Humanities and Social Science | | | Ph.D. in English / Economics |

These Programs are planned and overseen by the Senate of the Institute. The Senate is the highest academic decision-making body of the Institute. The Senate is assisted by the Senate Standing Committee (SSC), the Senate Undergraduate Board (SUGB), and the Senate Postgraduate Board (SPGB) which also help in implementing the decisions of the Senate. The Programs are periodically reviewed by the departments in consultation with the Expert Committees constituted by the Senate. The Expert Committees review and moderate the curriculum, syllabi, evaluation process, etc. of the Programs. The medium of instruction and evaluation of all the Programs are done in English. All the Academic activities are carried out as per the Academic Calendar approved by the Senate.

Due to the unprecedented onset of Covid-19 pandemic, the Senate of the Institute had decided to commence the Academic Session 2020-21 through Online mode for all the Undergraduate and Postgraduate Programs, in the interest of the Students and the Teaching fraternity. The Odd Semesters for existing students began on time. However, for fresh admission there was a delay of four months compared to the normal situation, due to delayed admission through Central Seat Allocation Board (CSAB) 2020. The dissemination of courses and evaluation was done through Online platform using Zoom. Google Meet, Skype etc. The following strategy was employed for evaluation:

| Components | Description | Max. Marks |
|---|---|---|
| Assignments | Minimum one assignment to be given from each unit. It should be ensured that assignments must cover all the topics from the unit and consist of numerical / design questions. | 25 |
| Oral Examination | TWO viva-voce should be conducted over Phone / Skype asking questions between 5-10 minutes. FIRST from 50% syllabus and SECOND from remaining 50%. | 10*2=20 |
| Online Test (Type-I) | MCQ, fill in the blank, short answer type, etc. questions will be set and the tests will be conducted through any online platform. TWO such test of 15-20 minutes duration will be conducted. FIRST test from 50% syllabus and SECOND from remaining 50%. | 10*2=20 |

| Components | Description | Max. Marks |
|---|---|---|
| Online Test (Type-II) | Essay type or long answer type, numerical type (if applicable) questions may be set and may be conducted by sending through any online platform. One such test of 60 – 120 minutes duration may be conducted from whole syllabus. Students will send their solutions/ answer after completing the test through any online mode. | 25 |
| Report | Report on a topic from each course which may include recent technology or advancements / major learning points. The report should consist of minimum 500 words. Students have to choose the topics from that course only, in consultation with course coordinators and will send it to the course instructor. (for better coordination the course coordinator can assign the topics to students based on their ability) | 10 |

All these measures were taken to avoid any kind of academic loss of Students and prioritizing the well-being of the Students and Teaching Faculty of the Institute.

To enhance and adept the communication skills of the students **an Audit Course entitled *Professional Practice* (English) was implemented in 2018** by the Department of Humanities and Social Sciences that consequently yielded to positive changes in student's results in the subsequent semesters in all the Departments and even better performance in Placement drives. It is imperative to mention that since induction of the Course in the Curriculum in 2018 the overall Placement record of the Institute has witnessed a steady increase.

# Admission Procedure

- **Bachelor of Technology (B.Tech.):**
  Admission to the B.Tech. Programs are done as per the Common Policy of the Government of India for CFTIs / NITs, based on merit in a National Level Test, namely, Joint Entrance Examination (JEE) Mains, conducted by the National Testing Agency (NTA). The seats are allocated by the Joint Seat Allocation Authority (JoSAA) / (CSAB) with 50% of the sanctioned seats filled under Home state quota from the state of Sikkim and the remaining 50% from candidates of other States, purely based on merit / ranking in JEE Main Examination through a Centralized Counseling System devised by the MoE, Govt. of India. Furthermore, a specified number of seats for foreign nationals / NRIs, selected under the policy laid down by Govt. of India (DASA / ICCR, etc.), are reserved for direct admission to 1st year of the Programs. Seats are also reserved for candidates belonging to the Scheduled Castes, Scheduled Tribes, Persons with Disabilities (PwD), Other Backward Classes and Economically Weaker Sections as per the guidelines issued by the MoE.

- **Master of Technology (M.Tech.):**
  The Admission to M.Tech. Degree Programs for the GATE qualified candidates are made through a Common Admission Process called Central Counseling for Masters' of Technology (CCMT). The Admission for Sponsored candidates from the Government Organizations / Industry / CFTIs etc., through a Test / Interview / GATE Score, on full-time basis, are also available. Sponsored candidates in M.Tech. Programs are not eligible to receive scholarship even if they qualify for GATE. Seats remaining vacant after the CCMT allocation are filled through an Institute Admission Test (IAT) conforming to the eligibility criteria set by the CCMT.

- **Master of Science (M.Sc.):**
  The Admission to the M.Sc. Course is made based on the IIT-JAM score through the process of Centralized Counseling for M.Sc. in NITs (CCMN). Seats remaining vacant after the CCMN allocation are filled through an Institute Admission Test (IAT) conforming to the eligibility criteria set by the CCMN.

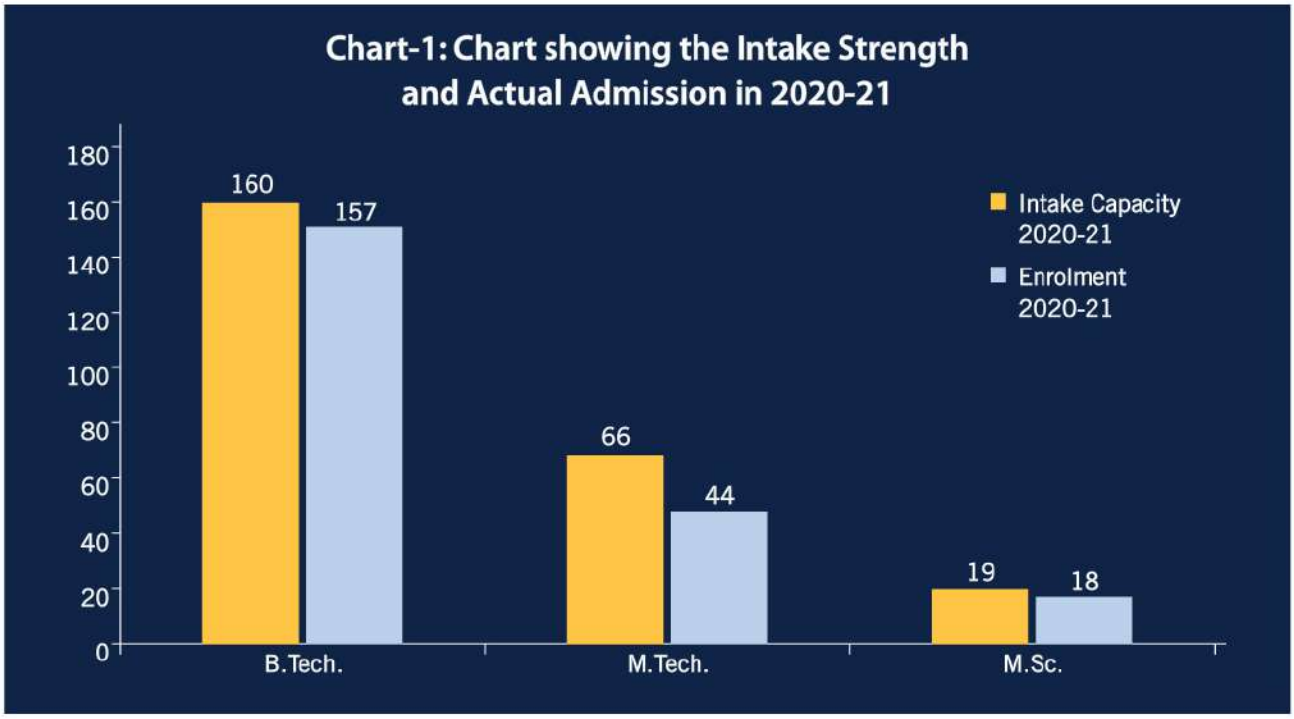
- **Doctoral Programs (Ph.D.):**
  Admissions to Ph.D. Programs (Regular / Part-time / Sponsored) are done through Institute Level Test / Personal Interview conducted by the respective Departments.

## 1.1. Admission Data 2020-21

### Table-2: Students Admitted in the Academic Year 2020-21

| Sl. No. | Departments | B. Tech. | | M. Tech. | | M.Sc. | |
|---|---|---|---|---|---|---|---|
| | | Intake Strength | Actual Admission | Intake Strength | Actual Admission | Intake Strength | Actual Admission |
| 1 | Civil Engineering | 30 | 29 | | | | |
| 2 | Computer Science and Engineering | 40 | 41* | 22 | 10 | | |
| 3 | Electronics & Communication Engineering | 30 | 29 | 22 | 17 | | |
| 4 | Electrical and Electronics Engineering | 30 | 29 | 22 | 17 | | |
| 5 | Mechanical Engineering | 30 | 29 | | | | |
| 6 | Chemistry | | | | | 19 | 18 |
| | **TOTAL** | **160** | **157** | **66** | **44** | **19** | **18** |

Note: The Admission in Ph.D. Program was not conducted due to the Covid-19 pandemic. * One candidate joined B.Tech. Program through ICCR Sponsored Quota.



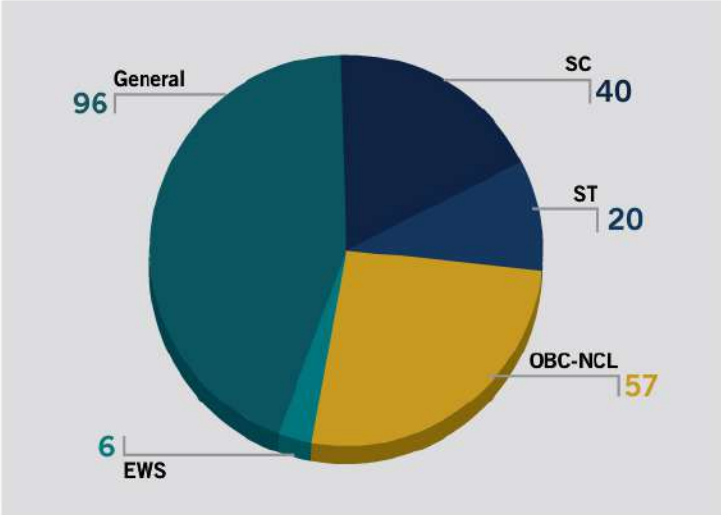

### Table-3: Category and Gender wise breakup of Admission in the Academic Year 2020-21

| Programs | Departments | Actual Admission in 2020-21 | Category | | | | | | Gender | | Special Category |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SC | ST | OBCNCL | EWS* | GEN | Total | Male | Female | PwD |
| B. Tech. | CE | 30 | 04 | 05 | 13 | NA | 07 | 29 | 23 | 06 | 00 |
| | CSE | 40 | 08 | 04 | 09 | NA | 20 | 41 | 32 | 09 | 01 |
| | ECE | 30 | 06 | 03 | 06 | NA | 14 | 29 | 22 | 07 | 01 |
| | EEE | 30 | 05 | 03 | 05 | NA | 16 | 29 | 22 | 07 | 00 |
| | ME | 30 | 05 | 02 | 08 | NA | 14 | 29 | 23 | 06 | 00 |

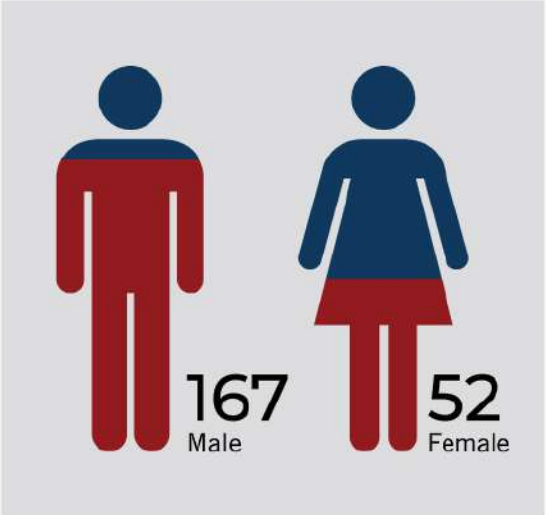
| Programs | Departments | Actual Admission in 2020-21 | Category | | | | | | Gender | | Special Category |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SC | ST | OBCNCL | EWS* | GEN | Total | Male | Female | PwD |
| M.Tech. | CSE | 22 | 03 | 01 | 01 | 00 | 05 | 10 | 08 | 02 | 00 |
| | ECE | 22 | 03 | 01 | 04 | 03 | 06 | 17 | 13 | 04 | 00 |
| | EEE | 22 | 03 | 01 | 06 | 01 | 06 | 17 | 14 | 03 | 00 |
| M.Sc. | Chemistry | 19 | 03 | 00 | 05 | 02 | 08 | 18 | 10 | 08 | 00 |
| | **TOTAL** | **245** | **40** | **20** | **57** | **6** | **96** | **219** | **167** | **52** | **02** |

*Reservation of EWS to the Admission in B.Tech. Programs in the year 2020-21 were not considered as it is exempted for the new NITs.

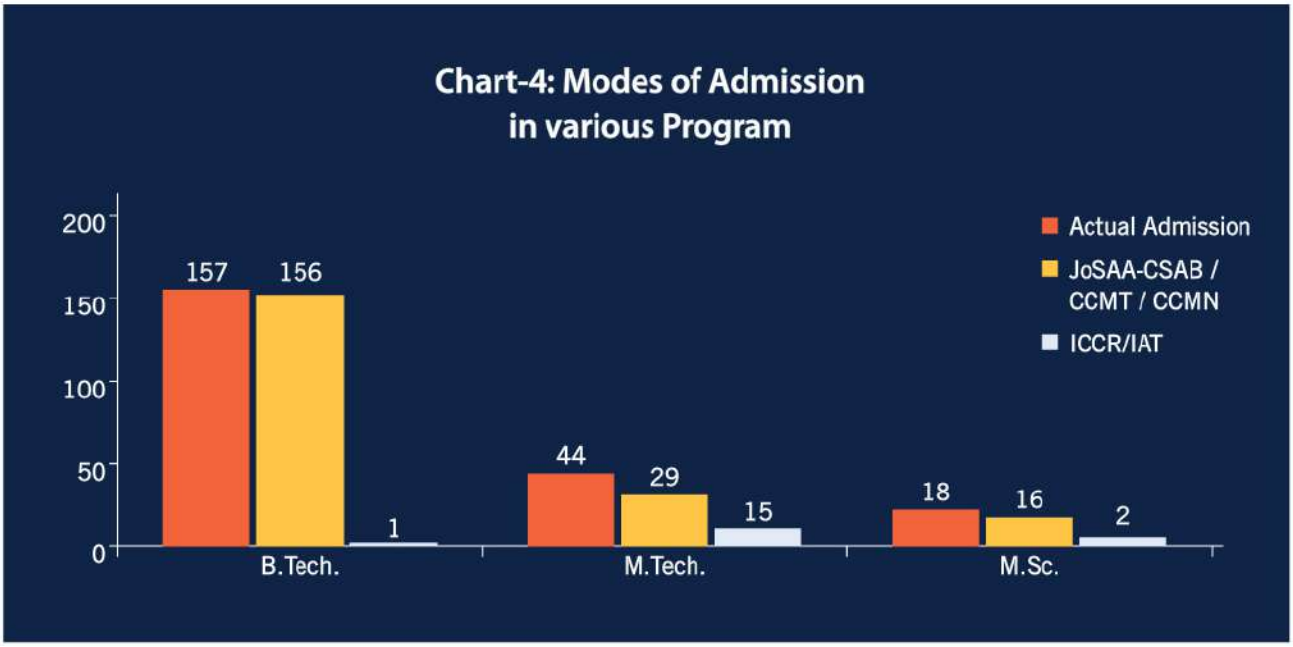
## Chart-2: Category wise details of Admission 2020-21




## Chart-3: Gender distribution of Students admitted in 2020-21




## Chart-4: Modes of Admission in various Program



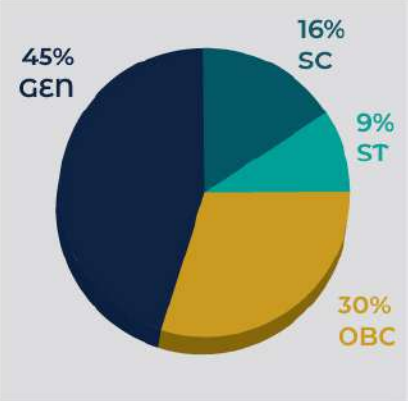
## 1.2 Total Students on Roll in the year 2020-21

### Table-4: Cumulative Strength of the Students during 2020-21

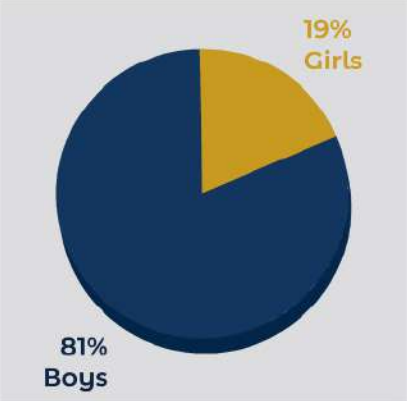
| Program | Category | | | | Gender | | | PwD |
|---|---|---|---|---|---|---|---|---|
| | SC | ST | OBC | GEN | TOTAL | Male | Female | |
| B.Tech. | 136 | 86 | 241 | 345 | 808 | 668 | 140 | 8 |
| M.Tech. | 11 | 3 | 14 | 37 | 65 | 54 | 11 | 0 |
| M.Sc. | 4 | 1 | 17 | 22 | 44 | 22 | 22 | 0 |
| Ph.D. | 4 | 2 | 18 | 29 | 53 | 40 | 13 | 0 |
| **Total** | **155** | **92** | **290** | **433** | **970** | **784** | **186** | **8** |

### Chart-5: Distribution of Students in percentile (Category, Gender and Program wise)

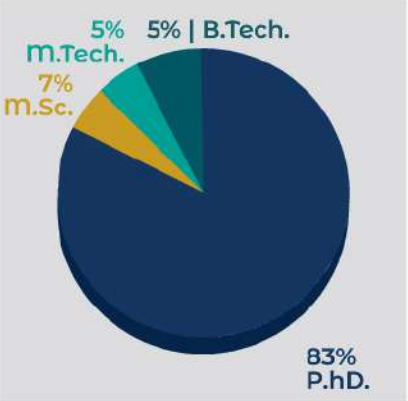
**Category**




**Gender**




**Program**




## 1.3. Academic Calendar

The Academic Calendar is prepared in such a way that all the curricular, co-curricular and other related activities / Programs of the Students are well distributed over the Semester Period.

The Academic Calendar prepared by the Academic Office is approved by the Senate. The major activities of Academic Calendar for the 2020-21 Academic Session are:

### Table 5: Academic Calendar of Odd Semester 2020-21

| Sl. No | Activities | B.Tech. 2nd, 3rd, 4th year, M.Tech. and M.Sc. 2nd year | M.Tech. and M.Sc. 1st year | B.Tech. 1st Year |
|---|---|---|---|---|
| 1 | Orientation / Induction Program | | October 1, 2020 | November 30- December 5, 2020 |
| 2 | Commencement of Class | August 3, 2020 | October 3, 2020 | December 7, 2020 |
| 3 | First Online Test (Type-I) and First Oral Examination | September 7-9, 2020 | November 9-11, 2020 | December 28- January 2, 2021 |
| 4 | Second Online Test (Type-I) and Second Oral Examination | November 2-7, 2020 | December 21-25, 2020 | January 25- 30, 2021 |
| 5 | Online Test (Type-II) | November 23- December 3, 2020 | January 21-29,2021 | March 8-19, 2021 |
| 6 | Declaration of Result | December 24, 2020 | February 3, 2021 | March 26, 2021 |
| 7 | Commencement of Odd Semester | January 18, 2021 | February 01, 2021 | April 5,2021 |

## Table 6: Academic Calendar of Even Semester 2020-21

| Sl. No. | Activities | B.Tech. 2nd, 3rd, 4th year, M.Tech. and M.Sc. 2nd year | M.Tech. and M.Sc. 1st year | B.Tech. 1st Year |
|---|---|---|---|---|
| 1 | Commencement of Class | January 18, 2021 | February 01, 2021 | April 5, 2021 |
| 2 | First Online Test (Type-I) and First Oral Examination | February 15 -20, 2021 | February 22 -27, 2021 | April 26-28, 2021 |
| 3 | Second Online Test (Type-I) and Second Oral Examination | March 22-27, 2021 | March 22-27, 2021 | May 24-25 & 27, 2021 |
| 4 | Online Test (Type-II) | April 26 - May 7, 2021 | April 26 - May 7, 2021 | June 28- July 3, 2021 |
| 5 | Declaration of Result | May 31, 2021 (for others) June 15, 2021 (M.Tech. 2nd Year) | May 31, 2021 (M.Tech. 1st Year) June 15, 2021 (M.Sc.) | July 12, 2021 |
| 6 | Pending Laboratory Classes, Summers course, Supplementary Examination, Internship, remedial classes etc. | June – July 2021 | June – July 2021 | July 5, 2021 onwards |
| 7 | Commencement of Odd Semester | August 2, 2021 | August 2, 2021 | August 2, 2021 |

## 1.4. Institute Fees for 2020-21 Academic Session (per Semester)

Table-7

| Programs | General / OBC {Annual Family Income 5 lakh and above} (in Rs.) | General / OBC {Annual Family Income between 1 to 5 lakh}** (in Rs.) | General / OBC {Annual Family Income less than lakh}** (in Rs.) | SC / ST / PwD** (in Rs.) |
|---|---|---|---|---|
| B.Tech. | 66,400.00 | 24,734.00 | 3900.00 | 3900.00 |
| M.Tech. | 38,900.00 | NA | NA | 3900.00 |
| M.Sc. | 11,400.00 | NA | NA | 3900.00 |
| Ph.D. | 11,400.00 (FT) / 9000.00 (PT) | NA | NA | 4100.00 (FT) / 1500.00 (PT) |

FT= Full time, PT= Part-time

Note: The above fee doesn't include the Hostels / Mess Charges

**Tuition fee Waiver / Remission: The tuition fees of B. Tech. Students belonging to SC, ST and PwD categories are fully waived as per MOE guidelines. Further, the General / OBC Students whose Annual Family Income is less than one lakh get full tuition fee waiver and with Annual Family Income bracket between one lakh to five lakh get 2/3rd of the tuition fees remission from 2016 onward vide MOE notification no.33-4/2014-TS.III.

The GATE qualified M. Tech. Students receive Fellowships as do the Ph.D. Scholars. A good fraction of the remaining students of the Institute also receive Scholarships from various Agencies.

## 1.5. Beneficiaries of Tuition Fee Exempted, Full Waivers, 2/3rd Fee Remission Categories of Students across the Programs

Table-8

| Programs | Full Tuition Fee Exempted | | Full Tuition Fee Waiver | 2/3rd Tuition Fee Remission | Tuition Fee Charged |
|---|---|---|---|---|---|
| | No. of SC / ST Students | No. of PwD Students | No. of OBC-NCL / GEN Students {Annual Family Income less than lakh} | No. of OBC-NCL / GEN Students {Annual Family Income between 1 to 5 lakh} | No. of OBC-NCL / GEN Students {Annual Family Income 5 lakh and above} |
| B. Tech. | 218 | 05 | 363 | 94 | 128 |
| M. Tech. | 14 | 00 | NA* | NA* | 51 |
| M.Sc. | 05 | 00 | NA* | NA* | 39 |
| Ph.D. | 06 | 00 | NA* | NA* | 47 |

## 1.6. Examination and Evaluation

All Undergraduate, Postgraduate Examinations and Ph.D. Course Work of the Institute are conducted by the respective Departments and centrally monitored by the Academic Section / Examination Cell. The medium of examination for all examinations including dissertations and thesis is in English.

The performance of a student is evaluated in terms of two indices viz; the Semester Grade Point Average (SGPA) for a Semester and Cumulative Grade Point Average (CGPA) which is the Grade Point Index for all the completed Semesters at any point of time. The Semester Grade Point Average (SGPA) is calculated based on Grades obtained in all courses in a Semester and Cumulative Grade Point Average (CGPA) is calculated based on Pass Grades in all completed Semesters.

For each course, a Grade is awarded based on Continuous Internal Assessment, Mid-Term Examinations, and End-Term Examinations for theory subjects with weightage of 20%, 30%, and 50% respectively. The paper setting and evaluation are done by the concerned Course Instructor of the Department. All evaluated answer scripts are shown to the students by the respective Course Instructors before submission of Grades to the Examination Cell.

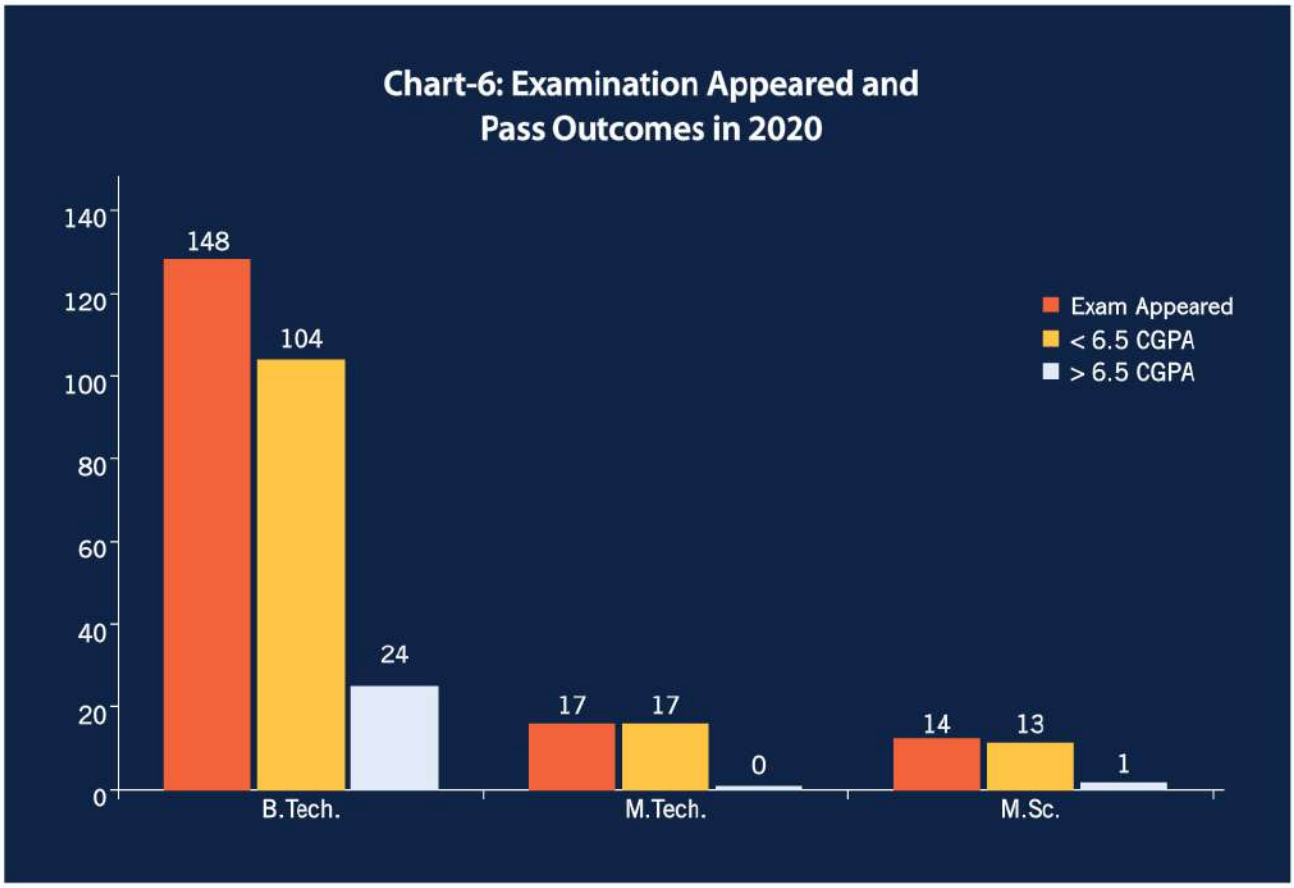
# 2. Award of Degrees

## 2.1. Final Year Result (June 2020)

Table-9

| Sl. No. | Program and Departments | Exam Appeared | Scored MORE than 6.5 CGPA | Scored LESS than 6.5 CGPA | Total Pass | Pass Percentage |
|---|---|---|---|---|---|---|
| 1 | B.Tech. in Civil Engineering | 20 | 13 | 7 | 20 | 100% |
| 2 | B.Tech. in Computer Science & Engineering | 39 | 36 | 3 | 39 | |
| 3 | B.Tech. in Electronics & Communication Engineering | 28 | 22 | 6 | 28 | |
| 4 | B.Tech. in Electrical & Electronics Engineering | 23 | 18 | 5 | 23 | |
| 5 | B.Tech. in Mechanical Engineering | 18 | 15 | 3 | 18 | |
| | **B.Tech. Total** | **128** | **104** | **24** | **128** | |
| 6 | M. Tech in Computer Science & Engineering | 06 | 06 | 00 | 06 | 100% |

| Sl. No. | Program and Departments | Exam Appeared | Scored MORE than 6.5 CGPA | Scored LESS than 6.5 CGPA | Total Pass | Pass Percentage |
|---|---|---|---|---|---|---|
| 7 | M. Tech in Microelectronics & VLSI Design | 05 | 05 | 00 | 05 | |
| 8 | M. Tech in Electrical Engineering (Control, Power and Electric Drives) | 06 | 06 | 00 | 06 | |
| | **M. Tech. Total** | **17** | **17** | **00** | **17** | |
| 9 | M.Sc. in Chemistry | 14 | 13 | 01 | 14 | 100% |
| | **M.Sc. Total** | **14** | **13** | **01** | **14** | |




## 2.2. Award of Ph.D. Degree in 2020

Table-10

| Sl. No. | Department | Name | Title of Thesis |
|---|---|---|---|
| 1 | Computer Science & Engineering | Mr. Tarun Biswas | Multi-Criteria Workflow Scheduling Based on Nature-Inspired Algorithms for Heterogeneous Computing Systems |
| 2 | Computer Science & Engineering | Mr. Banavath Balaji Naik | Swarm Inspired Meta-heuristic Algorithms for Multi-Criteria Workflow Scheduling in Cloud Environment |

# 3. The 3rd Convocation

The 3rd Convocation of the Institute was held on 7th December 2020 through the Virtual Mode and the Degrees were conferred upon 242 Students who had graduated in the year 2018 and 2019. It includes 187 Students of Bachelor of Technology, 37 Students of Master of Technology, 15 Students of Master of Science and 3 Students of Doctor of Philosophy. The following categories of Medals were awarded for Best Achievers:

## Table-11: List of Medal Awardees

| Category of Medals | Name of the Recipient | Graduating Year | Department | Program |
|---|---|---|---|---|
| Director Gold Medal | Miss Aurunima Samaddar | 2018 | Electronics and Communication Engineering | B. Tech |
| | Mr Arijit Mandal | 2019 | Mechanical Engineering | B.Tech. |
| Institute Gold Medal | Mr Manjeet Kumar | 2018 | Electronics and Communication Engineering | M. Tech. |
| | Miss Komal Raj | 2018 | Electrical and Electronics Engineering | B. Tech. |
| | Miss Diksha Rangwani | 2019 | Computer Science and Engineering | M. Tech. |
| | Mr Arijit Mandal | 2019 | Mechanical Engineering | B.Tech. |
| Departmental Gold Medal | Mr Manjeet Kumar | 2018 | Electronics and Communication Engineering | M. Tech. |
| | Mr Ritik Porwal | 2018 | Civil Engineering | B. Tech. |
| | Mr Sohan Lall | 2018 | Computer Science and Engineering | B. Tech. |
| | Miss Kumari Surbhi | 2018 | Electronics and Communication Engineering | B. Tech. |
| | Miss Komal Raj | 2018 | Electrical and Electronics Engineering | B. Tech. |
| | Mr Amarendra Kumar Mishra | 2018 | Mechanical Engineering | B. Tech. |
| | Miss Diksha Rangwani | 2019 | Computer Science and Engineering | M. Tech. |
| | Mr Rakesh Kumar Keshari | 2019 | Electronics and Communication Engineering | M. Tech. |
| | Mr Arjun Kumar | 2019 | Electrical and Electronics Engineering | M. Tech. |
| | Mr Piyush Kashyap | 2019 | Biotechnology | B. Tech. |
| | Mr Yadav Abhishek Arvind Kumar | 2019 | Civil Engineering | B. Tech. |
| | Mr Mangalam Gupta | 2019 | Computer Science and Engineering | B. Tech. |
| | Miss Antra Pramanik | 2019 | Electronics and Communication Engineering | B. Tech. |
| | Miss Chahat Bansal | 2019 | Electrical and Electronics Engineering | B. Tech. |
| | Mr Arijit Mandal | 2019 | Mechanical Engineering | B.Tech. |

# 3.1. Award of Ph.D. Degree in 3rd Convocation

**Table-12: List of Ph.D. Awardees**

| Sl. No. | Name | Departments |
|---|---|---|
| 1 | Mr Hemant Kumar Kathania | Electronics and Communication Engineering |
| 2 | Mr Surajit Kundu | Electronics and Communication Engineering |
| 3 | Mr Manish Mukhopadhyay | Mechanical Engineering |

# 4. Other Academic Activities

## 4.1. New Education Policy 2020

The National Education Policy 2020 (NEP 2020), which was approved by the Union Cabinet of India on 29 July 2020, outlines the vision of India's new Education System. The new Policy replaces the previous National Policy on Education, 1986. The Policy is a comprehensive framework for elementary education to higher education as well as vocational training in both rural and urban India.

The Institute is committed to implement the National Education Policy 2020 as envisioned by the Government of India. To study the Policy thoroughly and to recommend the implementation policies / measures, various Sub-committees based on the different thematic areas were constituted as under:

- Committee for Academic Reforms
- Committee for Research and Development Activities
- Committee for Internationalization
- Committee for the Promotion of Indian Language and Culture
- Committee for the National Innovation and Start-up Policy

These Committees are entrusted to prepare exhaustive strategic plans by refining the short-term and long-term goals for the implementation mechanism.

## 4.2. Induction Program

The Online Induction Program for the newly admitted students of B.Tech. Program was conducted from 30th November to 5th December 2020. It aims to help the students to acclimatize with the new teaching-learning environment, rediscover the joy of learning, absorb curricular material and the institutional ethos with greater ease, and enrich the quality of Faculty-Student interactions in the years to come. The program contains a series of activities including testing the ability of students in literary areas, departmental induction, lectures on effective handling of peer pressure, universal human values, extra-curricular activities such as yoga, meditation and lectures from eminent personalities from reputed industries, social activists and entrepreneurs.

## 4.3. Peer Group Learning

The Institute has launched a novel initiative of Peer Group Learning wherein the senior Students / Alumnus are invited to teach / mentor the junior Students. The initiative has been envisaged to develop aspects of professionalism in student tutors, supplement the regular teaching-learning process and contribute to the development of fellowship in the student community.

## 4.4. Professional Practice

Professional Practice forms an important part of the Undergraduate B. Tech. Curriculum. In order to broaden the horizon of the students, experts working in various professional organizations have been invited to deliver lectures to students, as a part of this course. The initiative is likely to enhance the employability of the students in professional organizations.

## 4.5. Revision of Institute Rules and Regulations

The Institute Rules and Regulations of Undergraduate, Postgraduate and Ph.D. Programs were revised to remove inconsistencies, inadequacies and convolutions, wherever necessary and to make the documents comprehensible for the Students, Faculty Members and for Administration of the Institute. The extensive review was done by External Experts and Institutional Members. The empowered Committees referred to similar rules of reputed institutions for this purpose.

## 4.6. Educational Exposure for School Students

The Institute invites School Students for educational tours / exposure visits from across the state of Sikkim. The purpose of this activity is to inspire and motivate students of the state to take up higher learning in Science and Engineering.

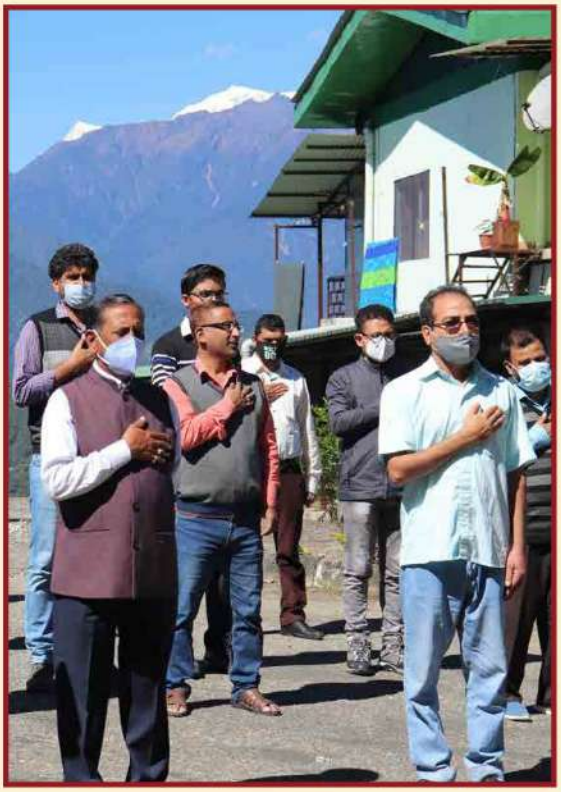
The Technical Staffs of the Institute take them on a guided tour of the campus including various Laboratories and Workshops, the Super Computer and Smart Classrooms. The Faculty Members also interact with School Students and apprise them of the myriad opportunities available in the fields of Science and Engineering and the Entrance Examinations which lead to these opportunities.

## 4.7. Senate Meeting

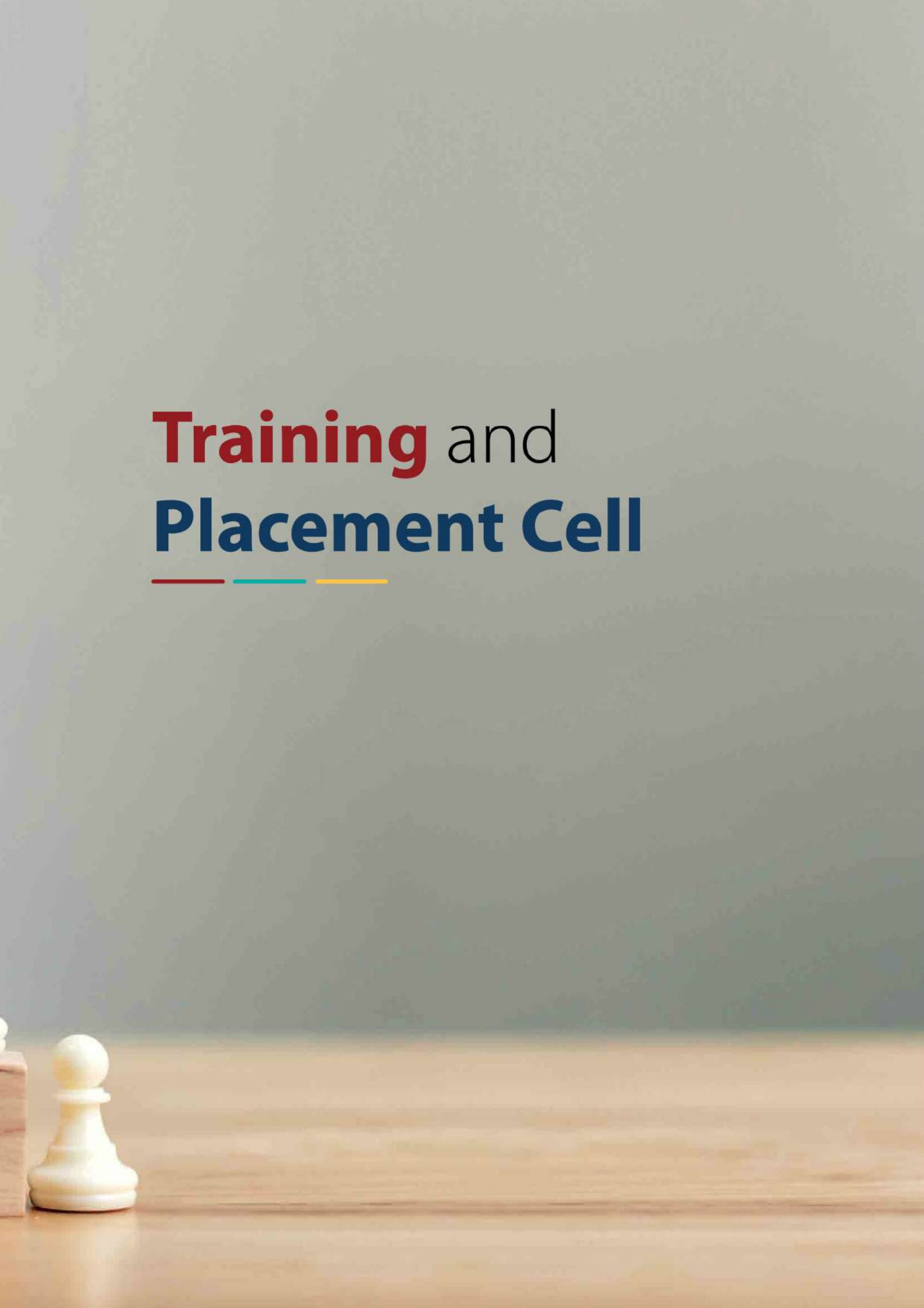
The Senate is the highest Academic Body of the Institute. It is constituted under Section 14 of the NIT Act 2007. All the major decisions related to academic matters are considered and approved by the Senate. The Director of the Institute is the Chairman of the Senate. The Meetings of the Senate were convened on the following dates during 2020-21:

- 12th Senate Meeting on 18th July 2020
- 13th Senate Meeting on 17th October 2020
- 14th Senate Meeting on 24th December 2020
- 15th Senate Meeting on 26th March, 2021

# Unity Day



# Training and Placement Cell



The Training and Placement Cell of National Institute of Technology Sikkim aims to build a strong interface between the corporate world and the Institute. Continuous interaction with the prospective recruiters is ensured to understand their requirements of knowledge and skill sets and to prepare our students accordingly. As in the past the Cell continued to plan, organize and consolidate the Training and Placement activities to assure that students are given adequate industrial training and subsequently get employment in organizations which match their aspirations and objectives. The Cell endeavors to present students the opportunities to attend various Expert Talks, Workshops, Webinars, Motivational and Professional Sessions in collaboration with various companies, institutes and TEQIP III under the Ministry of Education to improve the technical and soft skills of students, and is moving forward setting new benchmarks with each passing year.

## Confronting Pandemic: Unwavering Commitment

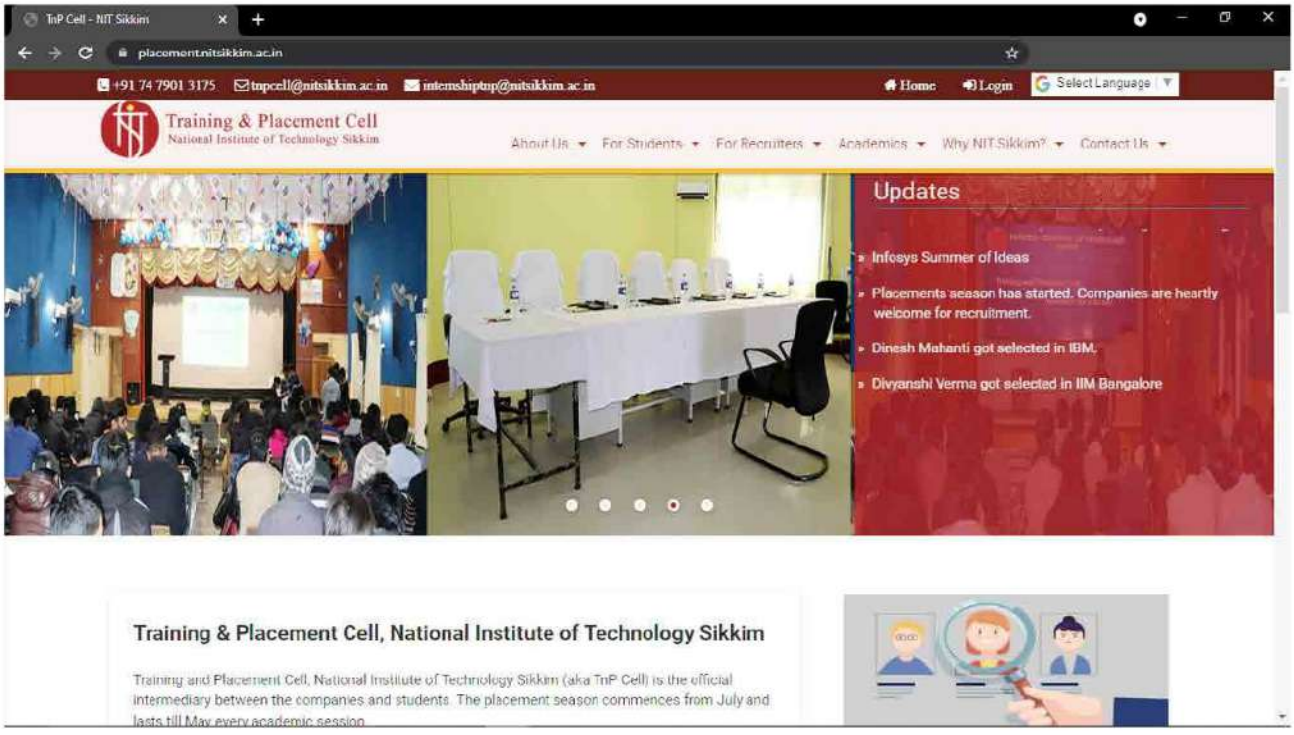
We at Training and Placement Cell believe that learning, growth and innovation never stops in any unprecedented situation hence to cater to our commitment of providing best to our students even in this worldwide pandemic caused due to COVID 19, T&P Cell has worked in several ways not only to provide the finest of the opportunities to the students through various placement and internship drives but also conducted several preparatory aptitude tests and coding tests. The Cell revamped its strategies to ease the online process of placements and internships for the students and to make them accustomed to this new normal. Several online interviews and screening tests were conducted successfully in this Academic Session. We have conducted various Virtual Placement Talks and Workshops that were intended towards developing professional ethics among students and guiding them in making educated career decisions.

## Activities

**T&P Activities in 2020-21 can broadly be described as:**

- Facilitating the hiring of current students for internships (Academic and Industry)
- Organizing professional training towards interview preparations and
- Organizing and conducting job interviews for graduating students through Campus Recruitment Drives.

It is pertinent to mention that the Institute has volunteered to offer an Audit Course entitled Professional Practice to enhance and adept the communication skills of the students that consequently yielded to better performance in placement drives. The positive impact of the Audit Course is observed through better performance in the placement drives. It is imperative to mention that since induction of the course in the curriculum in 2018 the overall placement record of the Institute has witnessed a steady increase as evident from the fact that the placement percentage for the year 2018 was 52%, for 2019 was 65%, for 2020 was 65% and it further increased in the year 2021 to 71%. The T&P Cell appreciates this gesture and is grateful to the Institute administration for all the support and encouragement to the Training and Placement Cell.



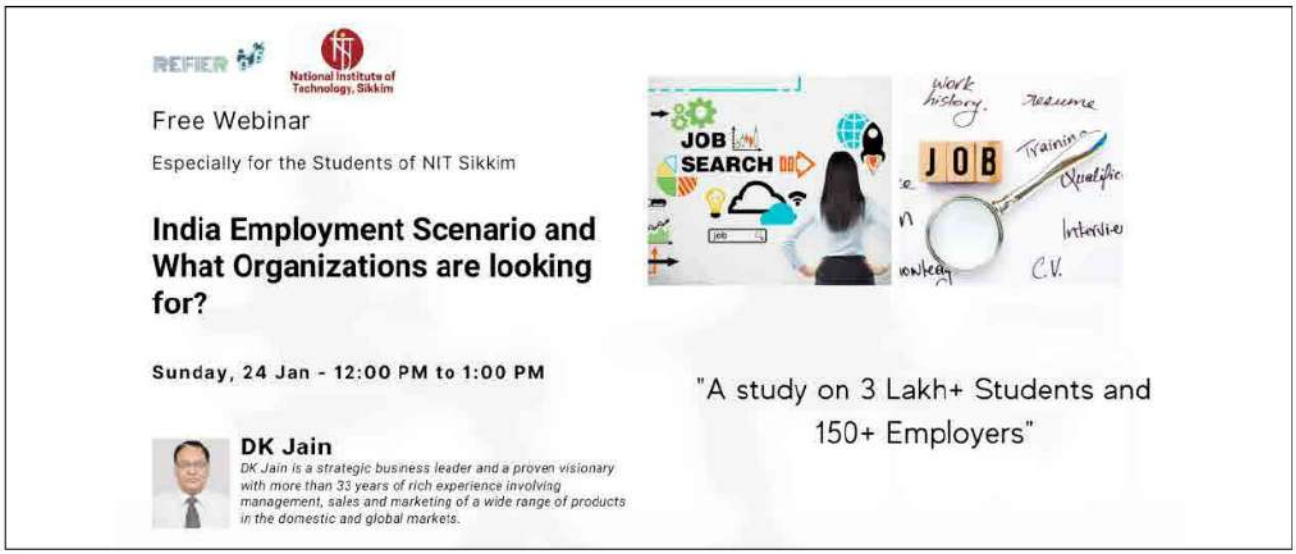
## Webinars and Talks

The Training and Placement Cell organized the following Webinars and Talks by eminent Academicians and Industry Experts during the year 2020-21.

## Webinars

| Sl. No. | Resource Person(s) | Topic | Date |
|---|---|---|---|
| 1. | Mohit Sharma & Haris Bin Zaman | Preparation Strategy for UPSC Civil Services Examination | 12th March 2021 |
| 2. | DK Jain | India Employment Scenario and What Organizations are looking for? | 24th January 2021 |
| 3. | Anurag Sharma | Interview Techniques and Resume Building | 10th January 2021 |

- **Webinar on Preparation Strategy for UPSC Civil Services Examination:** The Training and Placement Cell, in collaboration with NEXT IAS organized a Webinar on the topic **"Preparation Strategy for UPSC Civil Services Examination"** by Mr. Mohit Sharma and Mr. Haris Bin Zaman. The Webinar was for imparting knowledge on different strategies for preparation of Civil Services Examination. The Webinar focused on how to improve the preparation efficiency for UPSC Civil Services Examination.

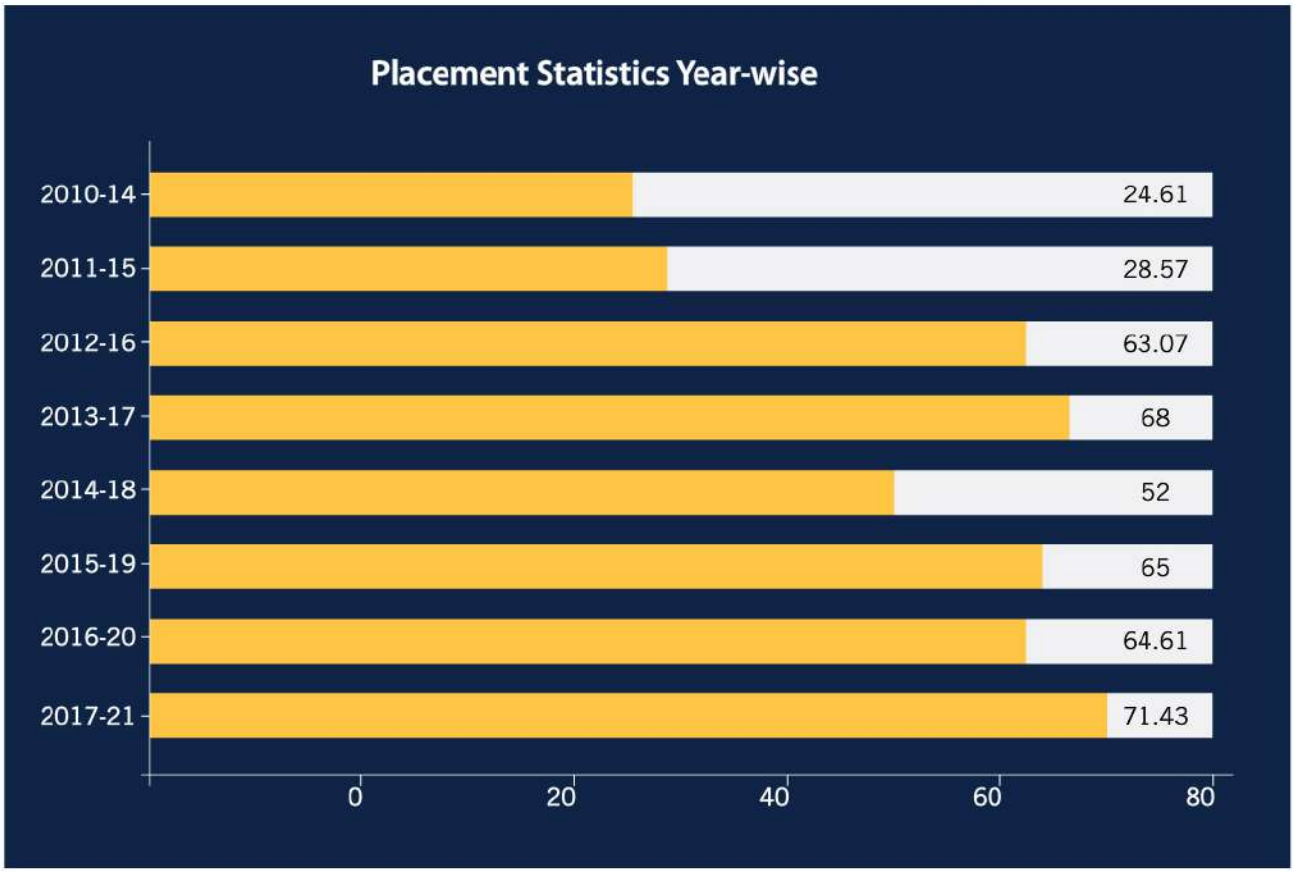

- **Webinar on India Employment Scenario and What Organizations are Looking for:** The Training and Placement Cell, in collaboration with Refier organized a Webinar on the topic **"India Employment Scenario and What Organizations are Looking for?"** by Mr. DK Jain. The purpose of the Webinar was to equip students with data points and the current trends so they can make informed decisions on their professional careers. The program intends to educate the students on the industry employment needs and the steps they can take to increase their chances of landing in their desired job.

- **Webinar on Interview Techniques and Resume Building:** The Training and Placement Cell, in collaboration with Learning from Ant organized a Webinar on the topic **"Interview Techniques and Resume Building"** by Mr. Anurag Sharma. In the first part of the Webinar Mr. Anurag shared several Interview Techniques and Resume Building tips with the students and the second half was an Interactive Session for the students to ask any kind of doubts and queries related to their career, placements, resume, communication, grooming, interview preparation, aptitude preparation, etc.

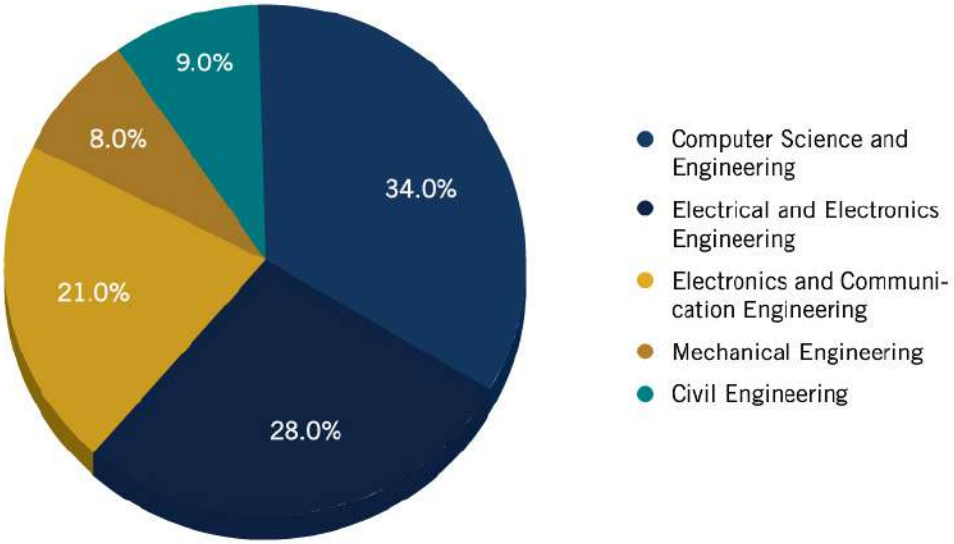
## Talks

| Sl. No. | Beneficiary Department(s) | Resource Person | Date |
|---|---|---|---|
| 1. | CSE, ECE, EEE, CE, ME | Capt. S Ravindra | 2nd February 2021 |


- **Talk on Life in the Indian Navy:** The Training and Placement Cell organized a talk by Capt. S Ravindra. The Session helped the students to get a glimpse about the fascinating life of Indian Navy and helped the aspiring minds who want to be its part to know more about the various other aspects of Indian Navy.



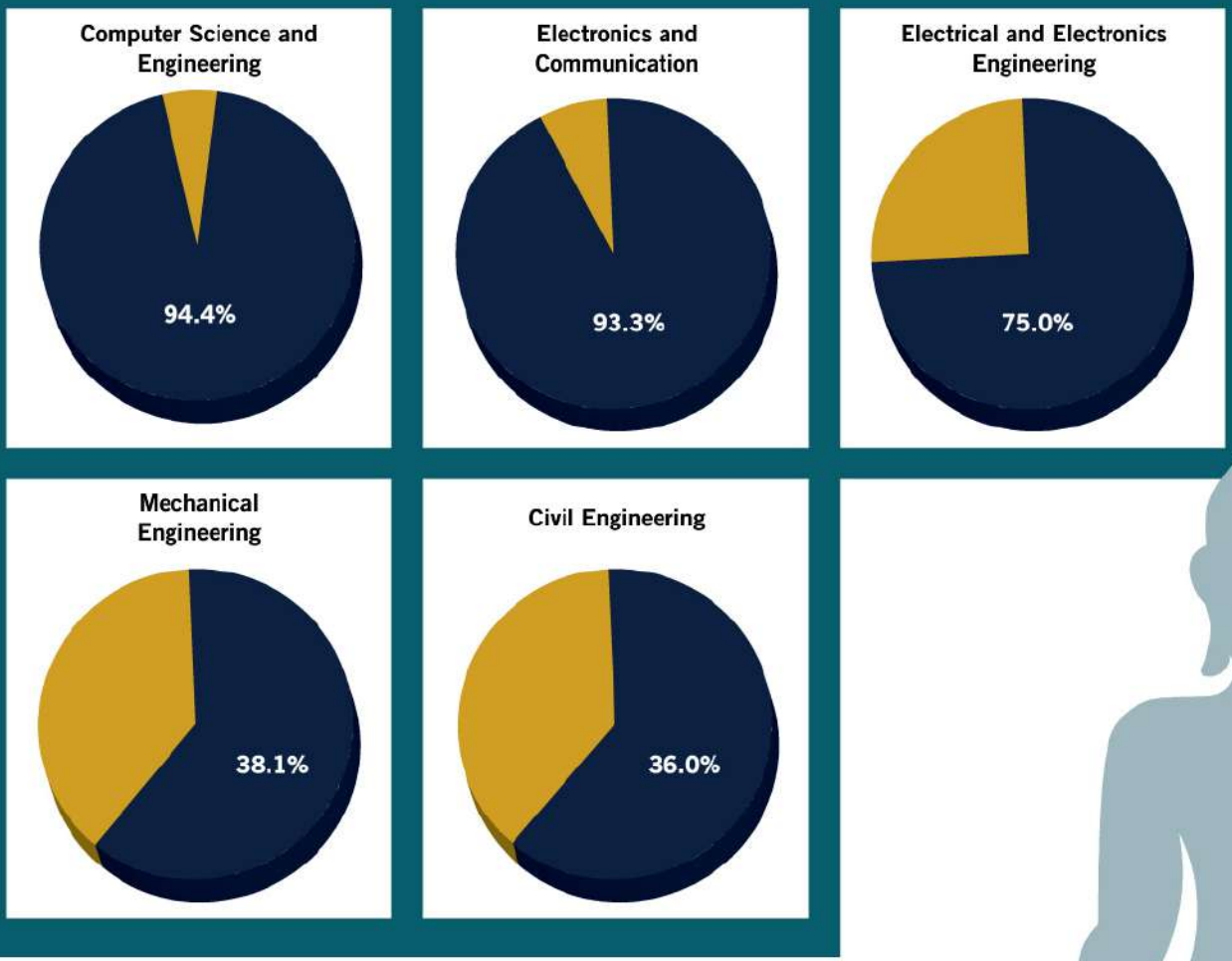
## Placement Statistics



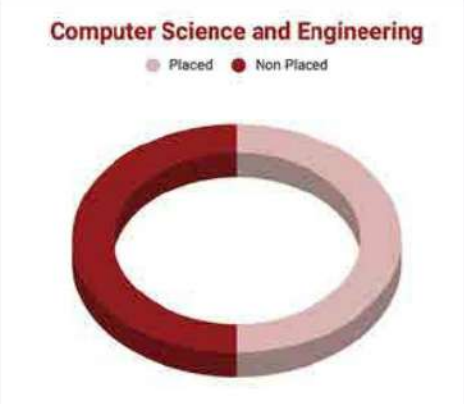

**Branch-wise Distribution of Placed Students**

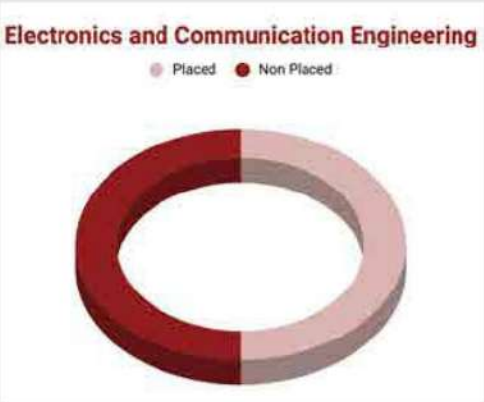
## Branch-wise Placement Percentage in the Academic Year 2020-21

### B.Tech



## M.Tech




## Detail Placement Statistics 2020-21

| Course | Branch | Total Number of Students | Number of Placed Students |
|---|---|---|---|
| B.Tech | Computer Science and Engineering | 36 | 34 |
| B.Tech | Electronics and Communication Engineering | 30 | 28 |
| B.Tech | Electrical and Electronics Engineering | 28 | 21 |
| B.Tech | Mechanical Engineering | 21 | 8 |
| B.Tech | Civil Engineering | 25 | 9 |
| M.Tech | Computer Science and Engineering | 4 | 2 |
| M.Tech | Electronics and Communication Engineering | 2 | 1 |
| | **Total** | **146** | **103** |

Companies from various sectors including those from the Core Engineering Domains, IT, Consulting, etc. have recruited students from the Institute. The average package is recorded as 7.11 LPA with 154 Total Placement Offers during the Academic Year 2020-21.

## Benchmark Placement Achievements in the Academic Year 2020-21

1) A total of six students from M.Tech and B.Tech got selected in Intel with a package of 18.33 LPA and 14.86 LPA respectively.
2) One student got selected in Sandvine Technologies with a package of 14.7 LPA.
3) One student got selected in ZS Associates with a package of 13.43 LPA.
4) Two students got selected in Platform9 Systems, Inc. with a package of 11.8 LPA and 10 LPA.
5) One student got selected in McAfee India Pvt. Ltd. with a package of 11 LPA.
6) Four students got selected in Anchanto Pvt. Ltd. with a package of 10 LPA.
7) Three students got selected in Click Labs Pvt. Ltd. with a package of 10 LPA.
8) Two students got selected in Optym India with a package of 10 LPA.
9) One student got selected in Saarthi with a package of 10 LPA.

## Internships

Internships enable the students to gain first-hand exposure of working in the Industry. It also allows students to improve their skills, knowledge, and theoretical practices that they learn in the Classrooms. Internships provide opportunities to witness the practical experiences of the professional world. In the Academic Year 2020-21, 276 students of B.Tech (2018-22 Batch, 5th & 6th Semester) and B.Tech (2019-23 Batch, in 4th Semester) have undergone Internships during the summer and winter vacations.

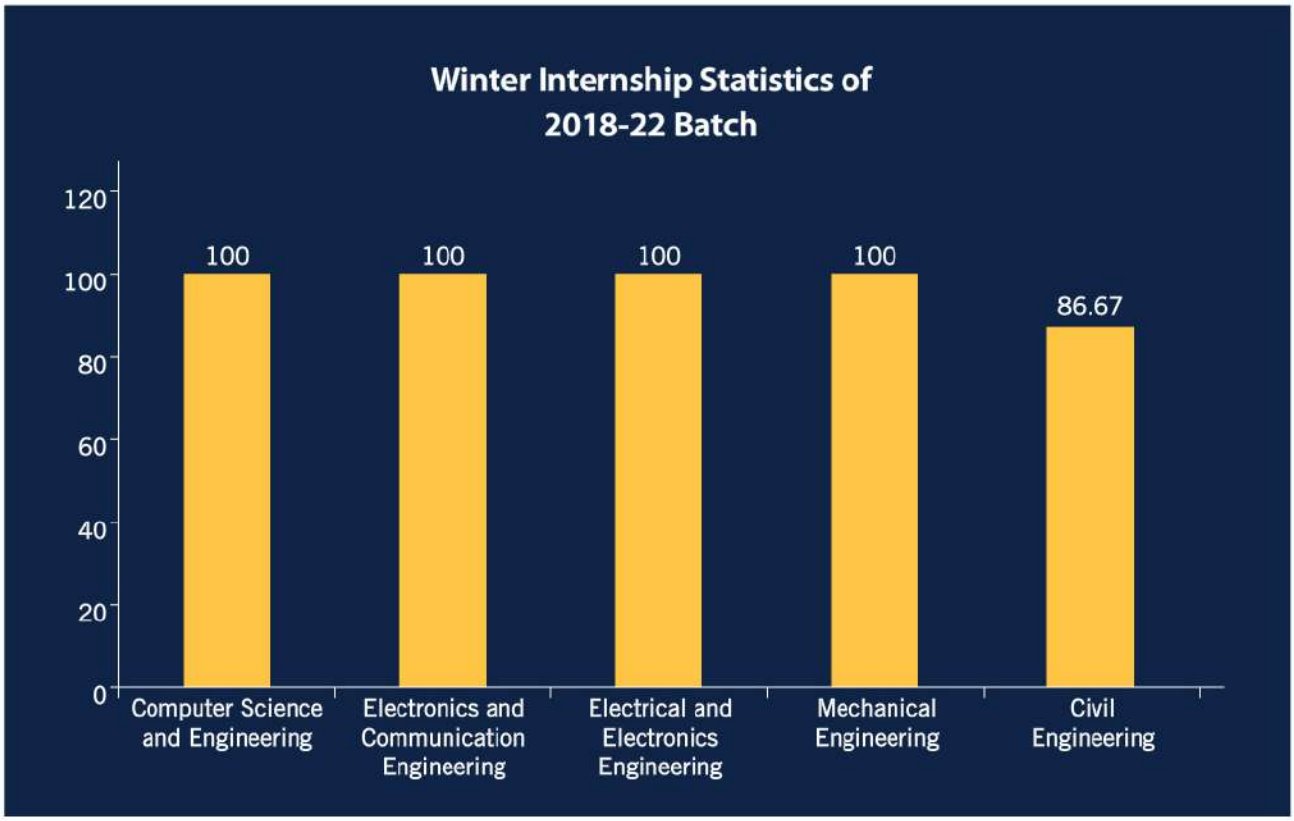
| Sl. No. | Organization | Branch(es) | No of Students |
|---|---|---|---|
| 1 | Avishkar Tech Solutions | CSE,ECE,EEE | 19 |
| 2 | XiPaar Solutions Pvt. Ltd. | CSE,ECE | 5 |
| 3 | Swabhav Techlabs Solutions Private Limited | CSE | 5 |
| 4 | Shunya IoT | CSE,ECE | 2 |
| 5 | Munchin | CSE | 1 |
| 6 | Orena Solutions | CSE,ECE,EEE | 5 |
| 7 | Null Innovation | CSE | 1 |
| 8 | Foxaisr | CSE,ECE,EEE,CE | 11 |
| 9 | Trivy Technologies Pvt Ltd | CSE | 1 |
| 10 | Parintek Innovations | CSE | 3 |
| 11 | Alorb Technologies | CSE | 1 |
| 12 | Techtious Technologies | CSE | 1 |
| 13 | Think2Exam Learning Solutions Llp | EEE | 1 |
| 14 | Pivotal Teleradiology | CSE | 1 |
| 15 | Navica Communications Pvt. Ltd. | ECE | 21 |
| 16 | OLatus Systems Pvt Ltd | ECE,EEE | 5 |
| 17 | BSPTCL | EEE | 9 |
| 18 | Pentech Ventures Llp | EEE | 1 |
| 19 | NHPC | EEE,CE | 5 |
| 20 | Drona Automation | ME | 16 |
| 21 | Electric Locoshed railway | ME | 1 |
| 22 | Bihar State Road Development Corporation LTD | CE | 1 |
| 23 | Skematic Consultants | CE | 19 |
| 24 | Highway Engineering Training | CE | 2 |
| 25 | Kartpay | CSE | 5 |
| 26 | YantroMitra Robotics | CSE,ECE,EEE,ME | 15 |
| 27 | Intellithink | CSE | 2 |
| 28 | La Polo | CSE | 1 |
| 29 | Inndev Solutions | CSE | 1 |
| 30 | Saltriver Infosystems Private Limited | CSE,ECE,EEE | 9 |
| 31 | Mindadda | CSE | 1 |
| 32 | Irasus Technologies | CSE,ECE | 4 |
| 33 | Intecore Technologies | ECE | 3 |
| 34 | Sensovision Systems | CSE | 1 |
| 35 | Sea Lord Entertainment | CSE | 3 |
| 36 | Innovocare Health Solutions | CSE,ECE | 4 |
| 37 | Unifirst robotics | ME | 3 |
| 38 | IIT Patna | CE | 12 |
| 39 | POSOCO | EEE | 19 |
| 40 | IvlAlpha Pvt. Ltd. | CSE,ECE | 4 |
| 41 | Jetson Robotics | EEE | 2 |
| 42 | Yavda Analytics | CSE | 1 |
| 43 | IBM | CSE | 1 |
| 44 | IIT Jodhpur | ECE | 1 |
| 45 | Samajh AI | ECE | 1 |
| 46 | LogicBoots | ECE,EEE,ME | 23 |
| 47 | BlueLit Solutions | ME | 1 |
| 48 | Viprush Technologies | CSE,ECE | 4 |
| 49 | Devlofox | CSE | 4 |
| 50 | Artmetrix | ECE | 1 |
| 51 | Microzensys | CSE,ECE | 9 |
| 52 | IIT Delhi | CE | 2 |
| 53 | IIT Tripura | CE | 2 |
| | **Total** | | **276** |

## Benchmark Internship Achievements in the Academic Year 2020-21

1) One student from B.Tech is offered a 6 month Internship at IBM with a stipend of 30,000 per month.

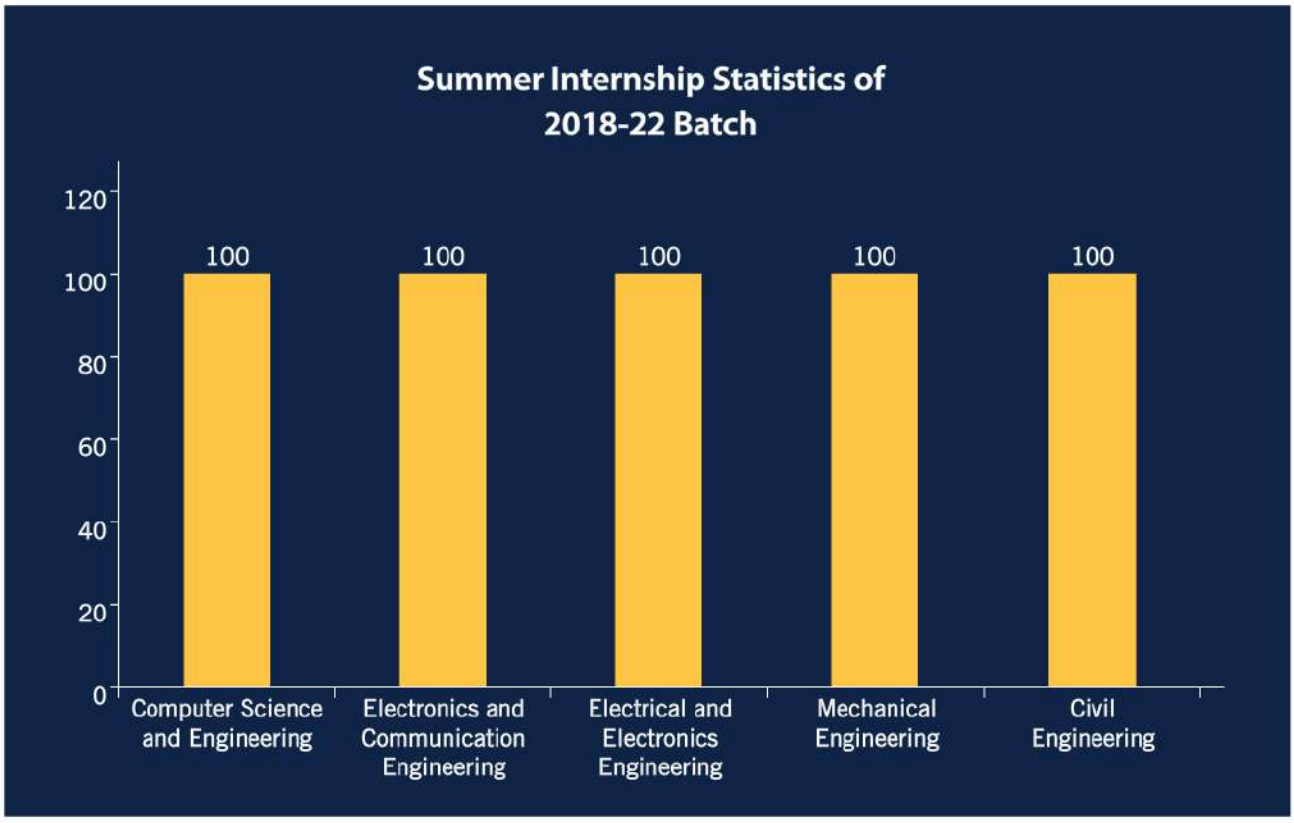
### Branch-wise Winter Internship of (B.Tech 3rd Year) 2018-22 batch (Odd Semester, 2020)

| Course | Branch | Total Students | Number of Students who received Internship |
|---|---|---|---|
| B.Tech | Computer Science and Engineering | 37 | 37 |
| B.Tech | Electronics and Communication Engi-neering | 27 | 27 |
| B.Tech | Electrical and Electronics Engineering | 25 | 25 |
| B.Tech | Mechanical Engineering | 17 | 17 |
| B.Tech | Civil Engineering | 15 | 13 |
| | **Total** | **121** | **119** |




### Branch-wise Summer Internship of (B. Tech 3rd Year) 2018-22 Batch (Even Semester, 2021)

| Course | Branch | Total Students | Number of Students who received Internship |
|---|---|---|---|
| B.Tech | Computer Science and Engineering | 36 | 36 |
| B.Tech | Electronics and Communication En-gineering | 25 | 25 |
| B.Tech | Electrical and Electronics Engineering | 28 | 28 |
| B.Tech | Mechanical Engineering | 22 | 22 |
| B.Tech | Civil Engineering | 16 | 16 |
| | **Total** | **127** | **127** |




## Branch-wise Summer Internship of (B. Tech 2nd Year) 2019-23 Batch (Even Semester, 2021)

| Course | Branch | Total Students | Number of Students who received Internship |
|---|---|---|---|
| B.Tech | Computer Science and Engineering | 27 | 10 |
| B.Tech | Electronics and Communication En-gineering | 19 | 10 |
| B.Tech | Electrical and Electronics Engineering | 18 | 2 |
| B.Tech | Mechanical Engineering | 4 | 4 |
| B.Tech | Civil Engineering | 7 | 4 |
| | **Total** | **75** | **30** |

## Students Pursuing Higher Studies

- Ms. Divyanshi Verma (B.Tech) of the Department of Computer Science and Engineering (2016-20 Batch) and a lead coordinator of T&P Cell qualified CAT-2020 and got admission in IIM Bangalore.
- Mr. Kota Hemanth Kumar (B.Tech) of the Department of Electronics and Communication Engineering (2016-20 Batch) and a coordinator of T&P Cell qualified GATE-2020 and got admission in IIT Kharagpur to pursue M.Tech in Visual Information and Embedded Systems.
- Mr. Adarsh Singh (B.Tech) of the Department of Civil Engineering (2016-20 Batch) and a coordinator of T&P Cell qualified GATE-2020 and got admission in IIT Kanpur for Ph. D program in Geotechnical Engineering.

# Student Welfare

*Training is everything*

— Mark Twain

A conjugal way of living student life with an ample opportunity to study and showcase creativity in different platform of cultural events and games & sports events at the same time led to a holistic and memorable college life. Despite many constraints of present temporary campus in a remote hill station, the institute try to matches such requirement by organizing several cultural, games-sports events, cleanliness drives throughout the year along with regular academic activities, in line with the directions of Ministry of Education (MoE), Government of India.

# Events and Activities

> Great things are done by a series of small things brought together.
>
> — Vincent Van Gogh

Various important and multidimensional events like Independence Day, Republic Day, Cultural Fest, Literary Events, Annual Games and Sports were organized by the Institute throughout the year. Students are encouraged and provided with the necessary assistance to participate in the Inter-NIT Sports, Cultural and Technical events. In line with the different campaigns of Government of India such as International Yoga Day, FIT India, Khelo India, Physical Education, Games, Sports and Cultural activities, Drug and Tobacco Free India, Unity Day, Hindi Pakhwada etc. are other events of the Institute where students can involve themselves to remain healthy and united. Also, several Departmental Clubs organized diverse student events on different occasions.

## Independence Day

The 74th Independence Day was celebrated in the campus with active participation of all Students and Employees on 15th August, 2020. The day was celebrated by March Past of security persons, followed by National Flag hoisting and National Anthem. Prof. M. C. Govil, Director, NIT Sikkim addressed the gathering about the importance of the day and the duties of Faculty members and Student community of NIT Sikkim for holistic development of our country.

## Republic Day

The 72nd Republic Day was celebrated in the campus with active participation of all Students and Employees on 26th January, 2021. The day was celebrated by March Past of security persons, followed by National Flag hoisting and National Anthem. Prof. M. C. Govil, Director, NIT Sikkim addressed the gathering about the importance of the day and shared valuable insight about the new education policy (NEP). A cricket match and online cultural events were also organized with enthusiastic participation of Students, Staff and Faculty Members.

National Flag Hoisting and Director's Speech in the 74th Independence Day and 72nd Republic Day

## EK BHARAT SHRESTHA BHARAT (EBSB)

Various cultural activities under EBSB campaign are conducted throughout the year to promote the unity in diversity. However, mostly the Online Events are organized by NIT Sikkim in association with Pair Institute NIT Delhi considering the COVID-19 pandemic. Students participated in various Online Events such as recitation, singing, quiz, presentation of cultural and historical heritages etc. Moreover, "Aaj Ka Vakya" campaign is promoted among the Students, Staffs and Faculty Members by sharing a sentence every week in diverse Indian languages.

*Glimpses of different EBSB activities*

### Fit India

Fit India Movement is a nation-wide campaign that aims people to include physical activity and sports in their everyday life. NIT Sikkim organised Fit India Freedom Run under the aegis of Fit India Movement from September, 20 to October 02, 2020 in its premises. The Faculty and Staff Members participated in the event physically and the students participated from their home virtually. Also, various Fit India activities such as Yoga, Kho-Kho, Cricket, Football, Badminton, Skipping and Musical Chair were conducted under this campaign. Art of Living Programmes was arranged for Students and Staffs to improve their mental health.




*Some glimpses of different Fit India activities*

## RUN FOR UNITY

A "Run for Unity" event was organized in Institute premises on 31st October, 2020 to celebrate the Rashtriya Ekta Diwas to mark the birth anniversary of Sardar Vallabhbhai Patel. The event became successful with the enthusiastic participation of NIT Sikkim family members.


*Some glimpses of Run for Unity event*

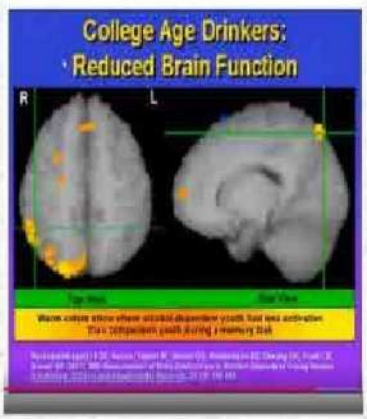
## International Day of Yoga

International Day of Yoga is observed every year on 21st of June in the Institute with enthusiastic participation of Students, Staff and Faculty Members. Students and Teachers of nearby schools are invited to participate in these events. However, this time the event was organized in a Hybrid Mode with physical participation of some Staff and Faculty Members, led by the Director and Online participation of the Students due to the COVID pandemic.

*Celebration of International Day of Yoga-2020*

## Initiative toward the Preventive Measure of Drug

A TEQIP-III sponsored Online Workshop on "Awareness Campaign on Preventive Measures and Drug Demand Reduction" was conducted on 26th September 2020. The Workshop focused on the prevention of drug used by students across the country. This Workshop Session was inaugurated by Prof. M. C. Govil, Director, NIT Sikkim followed by experts' session of Prof. Pratima Murthy, NIMHANS, Bangalore, and Shri. P. D. Rai, Ex. MP, Sikkim and Chairperson SAATHI, Sikkim. The Workshop was attended by more than 250 participants including students of NIT Sikkim and school students from Sikkim.



*Event Poster and some glimpses of the Workshop on "Awareness Campaign on Preventive Measures and Drug Demand Reduction"*

## Community Development

As per the instruction by MoE, Govt. of India, NIT Sikkim takes active participation in promoting Swachh Bharat Abhiyan, Unnat Bharat Abhiyan, etc. on a regular basis. The Institute conducted Cleanliness drive, Plantation drive, Fire Training Workshop etc. on different occasions with active participation of Students, Staff and Faculty Members under the guidance and supervision of the Director to promote Community Development. The Institute also invites eminent personalities and guests from various places to aware the students about their social responsibilities and to encourage and motivate them for such activities.

*Plantation Drive*

*Fire Training Workshop*

*Cleanliness Drive to promote Swachh Bharat Abhiyan*

*Fire Training Workshop*

# Peer Group Learning

Peer Learning Groups are formed to arrange the remedial classes specially for the 1st year B. Tech Students under monitoring and supervision of final year and pre-final year B.Tech Students. The Students were partitioned in 9 groups. The remedial classes were beneficial to complete the assignments, clearing the doubts and accruing the overall subject knowledge.

| Instructor (Student) Name | Roll No. of Instructor | Sessions (Hr.) | Instructor (Student) Name | Roll No. of Instructor | Sessions (Hr.) |
|---|---|---|---|---|---|
| Priya Kumari Prasad | B170122EC | 20 | Neelava Chatterjee | B180005CS | 18 |
| Sumit Raj | B170022CS | 16 | Konark Kesahw | B180089CS | 16 |
| Adarsh Srivastava | B180001CS | 17 | Jatin Kumar | B180029CS | 18 |
| Varsha Rani | B180032CS | 17 | Nizam Krishna Chaitanya | B180024CS | 18 |
| Shanu Tyagi | B180018CS | 22 | | | |

# Activities of the Departmental Clubs

Departmental Clubs are integral parts of all the Departments to support students learning, co-curricular activities and professional growth. The year-long activities of different Student Clubs are given below,

## THE REGNANT INK

The Departmental Club of Humanities and Social Sciences namely "The Regnant Ink" was established as a literary club on 24th February 2018 with a vision for holistic development of students inclusive of literary and vocal temper at National Institute of Technology Sikkim. In order not to make the students feel that there is a lack of effort in their extra-curricular side of college life, The Regnant Ink conducted all its events Online such as Confluence, Prove Us Wrong, etc. in a successful manner, glimpses of which are summarized below,

### ◆ Confluence

The Regnant Ink introduced Confluence, a series of interactive sessions with various alumnus, from 24th July 2020 to 30th August 2020 which functioned as a bridge between the present and past generation of NIT Sikkim.

| EPISODE | SPEAKER | DATE |
|---|---|---|
| 1st | Mr. Rohan Mahapatra | 24/07/2020 |
| 2nd | Mr. Vishal Sharma | 1/08/2020 |
| 3rd | Ms. Priyanka Minj | 9/08/2020 |
| 4th | Mr. Anurag D.Gaur | 16/08/2020 |
| 5th | Mr. Aditya Arya | 23/08/2020 |
| 6th | Mr. Ajay Kumar | 30/08/2020 |

*Speakers of Confluence*


*Event Posters of Confluence*

## Hindi Pakhwada

An assortment of Online Events was organised under the Hindi Pakhwada from 12-09-2020 to 17-09-2020 which primarily focused on the significance of the Hindi language.

| Sl. No. | Event | Date |
|---|---|---|
| 1 | कविता पाठ | 14/09/2020 |
| 2 | कविता लेखन | 15/09/2020 |
| 3 | चित्रकारी प्रतियोगिता | 13/09/2020 - 17/09/2020 |
| 4 | निबंधलेखन प्रतियोगिता | 16/09/2020 |
| 5 | कहानीलेखन प्रतियोगिता | 17/09/2020 |
| 6 | फोटोग्राफी प्रतियोगिता | 13/09/2020 - 17/09/2020 |




*Hindi Pakhwada Event details and Posters*

## Prove Us Wrong

One should never shy away from discussion and this was substantiated yet again with our first Online Debate Competition "Prove Us Wrong" which was organized from 19th to 20th of December, 2020.

| Sl. No. | Event | Date |
|---|---|---|
| 1 | Intra Departmental Debate Competition (Qualification Round) | 19-12-2020 |
| 2 | Inter-Departmental Debate Competition (Final Round) | 20-12-2020 |

## Cultural Events on Republic Day

On 26th January 2021, the 72nd Republic Day was celebrated by The Regnant Ink to commemorate the golden heritage of our country via Online Platform Google Meet with great fervor and passion.

*Celebrations of 72nd Republic Day on Virtual Mode*

## Azadi Ka Amrit Mahotsav

The Regnant Ink, in collaboration with TEQIP III, organised "Azadi Ka Amrit Mahotsav" (inaugurated by our honourable Prime Minister Shri Narendra Modi on 12th March 202) acknowledging India's freedom struggle.

## DevCANS, Development and Coding at NIT SIKKIM

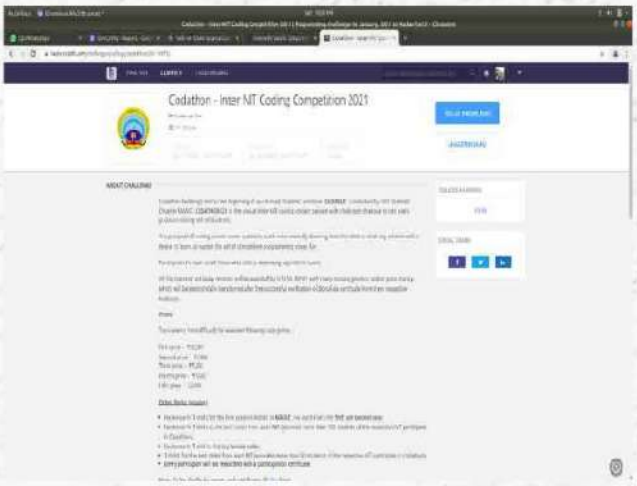
DevCANS, the Coding Club of NIT Sikkim Students, is primarily run by the Dept. of CSE. The various events of this Club in 2020-21 are summarized below,

## Logo Competition

Embarking on the path towards development of students in the field of Computer Science, a Logo Competition was organized on 23rd September 2020 with the aim to help students' bond with the Club by shaping their artistic view into image vectors. The competition received 8 entries from Students, out of which the present logo was chosen.

## Codathon - Inter NIT Coding Competition 2021

With an aim to enrich students with the experience of competing with NITians all across the country, students were encouraged to participate in a week-long Coding competition starting 7th January with each question as a stepping stone for self-development. With 127 participants from NIT Sikkim, the Institute stood 12th amongst all the NITs in terms of number of participants, showcasing the inclination of students towards Coding. This also allowed the students to get a firsthand experience of problem solving under pressure which is a valuable skill.





## Workshop on Open Source Contribution and Google Summer of Code

DevCANS organized a Talk Session on Open Source Contribution and Google Summer of Code dated 7th February 2021. The Session aimed to help students understand the basics of Open Source Contribution and choose the right way to clear GSoC. The aforementioned session had M. Sangam Kumar, NIT Sikkim Alumnus (B150110CS) and a GSoC Intern, as its speaker in order to enlighten the students. The Session witnessed a participation of 157 students from all disciplines of the institute and concluded with a Q&A Session which provided them with the much needed insight into software development, testing and best practices.

## Monthly Coding Competitions

Keeping in mind the need for consistency and determination in order to nurture a coding temper, DevCANS promoted and discussed monthly Coding competitions organized by platforms like HackerEarth and CodeChef with at least 15 to 20 monthly participants.

| Sl. No. | Name | Date | Duration |
|---|---|---|---|
| 1. | December Circuits' 20 | 19/12/2020 | 7 days |
| 2. | February Circuits' 21 | 20/02/2021 | 7 days |
| 3. | March Circuits' 21 | 15/03/2021 | 7 days |
| 4. | April Circuits' 21 | 10/04/2021 | 7 days |

## Talk on Competitive Coding and Placement Preparation

On 2nd May 2021, DevCANS organized a talk on Competitive Coding and Placement Preparation to help students prepare for their future endeavours and get a deeper insight of the industry work culture and Coding practices. The event had 58 participants from NIT Sikkim, wherein Ms. Mamta Kumari (an industry expert) guided students and encouraged them to sharpen their Coding skills to the fullest.

# Anuvrat

Anuvrat is the Departmental Club of Electronics and Communication Engineering Department, envisioning the never-ending innovation to build an ultimate perspective of new creation, with a motto to encourage students towards Research and Developmental works. The Club provides the young Engineers a platform to put forward their ideas, innovations, and thought processes to the world. The technical events organized by Anuvrat are summarized below,

| Sl. No. | Event | Resource Person | Topic of Discussion | Date of Event |
|---|---|---|---|---|
| 1 | National Science Day Lecture | Prof. Sankar Kumar Pal, National Science Chair, Emeritus Professor, Distinguished Scientist and Former Director, ISI Kolkata | Granular Mining in Video Analytics | 28th February, 2021 |
| 2 | Vimrishyotsava (Alumni Talk)-Episode 1 | Mr. Navneet Kishan, SoC design Engineer at Intel Corporation | Digital VLSI Design | 21st March, 2021 |
| 3 | Vimrishyotsava (Alumni Talk)-Episode 2 | Mr. Rajat Kumar Sinha, PhD Scholar, University of Toronto. | Nanophotonics | 28th March, 2021 |
| 4 | Vimrishyotsava (Alumni Talk)-Episode 3 | Mr. Paras Ram Meena, Sales Officer, Hindustan Petroleum Corporation Limited | Financial Systems and Capital Market | 4th April, 2021 |
| 5 | Vimrishyotsava (Alumni Talk)-Episode 4 | Mr. Nishant Choudhary, Engineer, Intel Corporation | Embedded Systems | 11th April, 2021 |
| 6 | Vimrishyotsava (Alumni Talk)-Episode 5 | Mr. Shubham Jain, Software Development Engineer, Flipkart | BitCoin-Working, Methodology & Blockchain Technology | 18th April, 2021 |
| 7 | Vimrishyotsava (Alumni Talk)-Episode 6 | Mr. Ankur Jha, Deputy Engineer, Bharat Electronics Limited | Basics of RADAR Systems | 25th April, 2021 |

# Nirmaan

Department of Civil Engineering runs a non-profit organization "NIRMAAN" which was established in 2015. The members of the Society include the Undergraduate Students, Faculty Members and Alumni of the Civil Engineering Department. The Society works to help and facilitate the overall development of students pursuing Civil Engineering. NIRMAAN provides a platform to showcase and sharpen students' talents through a variety of events and activities planned throughout the year. The platform is also extended to the students of other departments, whenever possible.

## National Science Day Celebration by Dept. of Mechanical Engineering

National Science Day was celebrated Online in the Mechanical Engineering Department on February-28, 2021 at 4:30 PM. Dr. Shambhunath Barman, HoD, ME shared his view about the significance of scientific applications in the daily life of Mechanical Engineering Students as well as to mark the discovery of the Raman Effect by Indian physicist Sir C. V. Raman. B.Tech Students of ME Department participated actively in the event. They showcased their talents in the form of speech on Science Day, singing, recitation, story-telling, beat boxing and instrument-play.

*Glimpses of students' participation on National Science Day Celebration*

# Glimpses of some more Events at NIT Sikkim

*Screenshots of Teachers' Day Video wishes by the Students in association with The Regnant Ink*


*Observation of Constitutional Day*

*Diwali Celebration*

# Facilities for Students

## SCHOLARSHIPS

**Institute Nodal Officer (Scholarship) - Mr. Ram Nepal**

The students of NIT Sikkim are benefitted by Scholarships under different schemes of Central and State Government. Since 2020, Ministry of Social Justice & Empowerment has increased the slots from 10 to 28 fresh slots for NIT Sikkim under the scheme "Top Class Education for SC students." All the ST category students are eligible to apply for Scholarship under "Top Class Education for ST students" from Ministry of Tribal Affairs; however the respective Ministry awards the Scholarship to the students being shortlisted. NIT Sikkim has registered to the Scholarship Portal of many states that provides financial assistances to the students based on their family income and academic performance under various categories and accordingly the students are benefitted from their respective States. Students belonging to Minority Communities receive Scholarships from Ministry of Minority Affairs (MOMA). Department of Empowerment of Persons with Disabilities provides Scholarship to the students with disabilities. Apart from the mentioned schemes, the students may also apply for Central Sector Scheme of Scholarships for College and University Students under the Department of Higher Education. Students also are benefitted by the Scholarship schemes assisted by the University Grants Commission – MHRD under the schemes of Ishan Uday - Special Scholarship Scheme for North Eastern Region and PG Indira Gandhi Scholarship for Single Girl Child. Students also receive Scholarships from other funding agencies like Foundation for Academic Excellence and Access (FAEA), Swami Dayanand Charitable Education Foundation, S.R Jindal Scholarship, Samsung Star Scholarship, etc.

The details for the Scholarships have been mentioned below:

### A) National Fellowship and Scholarship Scheme for Higher Education of ST students

Under this scheme, the students get financial assistance incurred on the following -

a. Tuition Fees: All the ST students get full Tuition Fee waiver as per the Institute rule.
b. Books & Stationery: Rs.3,000/- per annum per student.
c. Living Expenses: Rs. 2,200/- per month.
d. Computer & Accessories: Rs.45,000/- One-time assistance during the Course.
e. Other Non-Refundable Charges: Other Institute Non-Refundable Fees paid by the student for all academic / non-academic purposes. This amount may vary year wise.

### B) Central Sector Scholarship Scheme of Top Class Education for SC Students

Under this scheme, the students get financial assistance incurred on the following -

a. Tuition Fees: All the SC students get full Tuition Fee waiver as per the Institute rule.
b. Books & Stationery: Rs.5,000/- per annum per student.
c. Living Expenses: Rs. 36,000/- per annum.
d. Computer & Accessories: Rs.45,000/- One-time assistance during the Course.
e. Other Non-Refundable Charges: Other Institute Non-Refundable Fees paid by the student for all academic / non-academic purposes. This amount may vary year wise.

### C) Central Sector Scheme of Scholarship for College and University Students

The Scholarship amount is Rs.10,000/- per annum.

### D) Merit Cum Mean Based Scholarship for Students belonging to Minority Communities

Under this Scheme, the students get financial assistance incurred on the following -

a. Course Fee: Rs. 20,000/- per annum.
b. Maintenance Allowance: Rs. 10,000/- per month for a duration of 10 months in Academic Year.

### E) Central Sector Scheme of Scholarships for Students with Disabilities

Under this Scheme, the students get financial assistance incurred on the following -

a. Maintenance Allowance: Rs. 1600/- per month.
b. Disability Allowance: This amount may vary depending upon the disability criteria of the candidate.
c. Book Allowance: Rs. 1500/- per annum.
d. Reimbursement of Compulsory Non-Refundable Fees: Other Institute Non-Refundable Fees paid by the student for all academic / non-academic purposes. This amount may vary year wise.

### F) Scholarships from other States

Students belonging to the following states avail Scholarship from their respective state government Scholarship schemes: Bihar, Madhya Pradesh, Rajasthan, Jharkhand, Assam, Sikkim.

## G) Scholarships from other Funding Agencies

a. Swami Dayanand Charitable Education Foundation
b. Samsung Star Scholarship
c. Foundation for Academic Excellence and Access (FAEA)
d. S.R Jindal Scholarship
e. NHFDC

Other than these, there are many more Scholarship Schemes of Central & State Govt. of India where the students are directly benefitted. After verification at the Institute level, students' applications are forwarded to their respective state and then to the respective Ministry. If selected by the Awarding Authority, the students directly receive their Scholarship in their bank accounts.

Railway Concession Service is also provided to students from the Student Welfare Office.

**No. of Students recommended for Scholarship during the year 2020-21 through the Central Scheme & UGC Schemes is given below:**

| Sl. No. | Scholarship Schemes | No. of Students |
|---|---|---|
| 1 | Central Sector Scholarship of Top-Class Education for SC Students | 44 |
| 2 | National Fellowship and Scholarship for Higher Education for ST Students- Scholarship (Formally Top-Class Education for Schedule Tribe Students) | 30 |
| 3 | ISHAN UDAY - Special Scholarship Scheme for North Eastern Region | 6 |
| 4 | Central Sector Scheme of Scholarships for College and University Students | 6 |
| 5 | Merit Cum Means Scholarship for Professional and Technical Courses CS | 3 |
| 6 | Post-matric Scholarship for Students with Disabilities | 1 |
| 7 | Scholarship for Top Class Education for Students with Disabilities | 1 |
| 8 | Financial Support to the Students of NER for Higher Professional Courses (NEC Merit Scholarship) | 1 |
| 9 | PG Scholarship Scheme for SC, ST Students for Pursuing Professional Courses | 4 |
| | **Total Students** | **96** |

**No. of Students applied for Scholarship during the year 2020-21 from other States Schemes are given below:**

| Sl. No. | Scholarship Schemes | No. of Students |
|---|---|---|
| 1 | Mukhyamantri Medhavi Vidyarthi Yojna (MMVY), M.P | 2 |
| 2 | Mukhyamantri Jan Kalyan Yojna (MMJKY), M.P | 1 |
| 2 | Post Matric Scholarship, Uttar Pradesh | 12 |
| 3 | eKalyan, Govt. of Jharkhand | 6 |
| 4 | Post Matric Scholarship to OBC Students, Assam | 3 |
| 5 | Post Matric Scholarship for ST Students, Manipur | 1 |
| 6 | Umbrella Scheme for Education of ST Children- Post Matric Scholarship (PMS) for ST Students, Arunachal Pradesh | 1 |
| | **Total Students** | **26** |

# Hostel Accommodation

At present, the Institute is located in a temporary campus and hostel accommodation within the campus is limited. Institute accommodation within and outside the campus is available for UG (B. Tech) and PG (M. Tech, M. Sc. and Ph. D) Students. Separate hostel accommodation is also available for Girl students within the campus. All the hostel rooms are equipped with necessary furnitures such as Cot, Chair-Table, Almirah etc. In-Campus hostels are fully Wi-Fi enabled. The students are also facilitated with basic amenities like Geyser, Washing Machine, TV, Gymnasium, and indoor games in the hostels.

### A. In Campus Hostels Details

**Chief Warden In-Campus** - Dr. Om Prakash

## (i) Boys Hostel

| Sl. No. | Name of the Hostel | No. of Students | Name of Wardens |
|---|---|---|---|
| 1. | Prefab-1 | 138 | Dr. Dhananjay Tripathi<br>Mr. Sumit Kumar |
| 2. | Prefab-2 | 155 | Dr. Shambhunath Barman<br>Dr. Kuntal Mandal<br>Mr. Gajendra S. Shekhawat |
| 3. | BH- 1 | 19 | Dr. Anjan Kr. Ray |
| 4. | BH- 2 | 26 | Dr. Molay Roy |
| 5. | BH-3 | 26 | Mr. B. Balaji Naik |

## (ii) Girls Hostel

| Sl. No. | Name of the Hostel | No. of Students | Name of Wardens |
|---|---|---|---|
| 1 | GH-1 | 24 | |
| 2 | GH-2 | 07 | |
| 3 | GH-3 | 30 | Ms. Reshmi Dhara |
| 4 | GH-4 | 29 | Ms. Gopa Bhaumik |
| 5 | GH-5 | 23 | Ms. Anulekha Saha |
| 6 | GH-6 | 30 | |
| 7 | GH-7 | 7 | |

### B. Off- Campus Boys Hostel

Six buildings are hired on rental basis at Ravangla town to accommodate the UG 1st year and PG Boys Students. Further, bus facility is provided to the students residing at off- campus hostels for their convenience.

**Chief Warden Off-Campus** – Dr. Debajit Saha

| SN | Name of the Hostel | Students Category | Name of Wardens |
|---|---|---|---|
| 1. | OH-01 | Ph.D. Scholars and Project Fellow | Dr. Sukanta Dhar |
| 2. | OH-02 | Ph.D. Scholars and Project Fellow | Dr. Abhishek Ranjan |
| 3. | OH-3 | B. Tech 1st Year Boys: 23 in total | Dr. Pradip Mondal |
| 4. | OH-04 | B. Tech 1st Year Boys: 104 in total | Mr. Manohar Kumar |
| 5. | OH-05 | B. Tech 1st Year Boys: 40 in total | Mr. Pratik Kumar Shaw |
| 6. | OH-06 | PG (M. Tech and M. Sc.): 43 in total | Mr. Prasenjit Dey<br>Dr. Avinash Kumar<br>Mr. Pankaj Kr. Keserwani<br>Dr. Shitendu Some |

# Mess Facilities

Three separate student messes are running at NIT Sikkim. Two messes are located separately within the campus, which are dedicated and catered to facilitate In-campus Girls and Boys Students. One mess is located at Off-campus hostel, which is catered to students residing at Off-campus hostels. The Student Mess Committee under the supervision of Chief Warden and other Wardens oversees the smooth functioning and quality of the services provided by the Mess Contractor.

# Games and Sports

Despite the dearth of space in the temporary campus, efforts have been made to provide necessary recreation, games and sports facilities to the students. A multi- gymnasium has been provided to the students. Various Games and Sports events were organized by the Institute throughout the year. Students are encouraged and provided with the necessary assistance to participate in the Inter-NIT Sports, Cultural and Technical events.

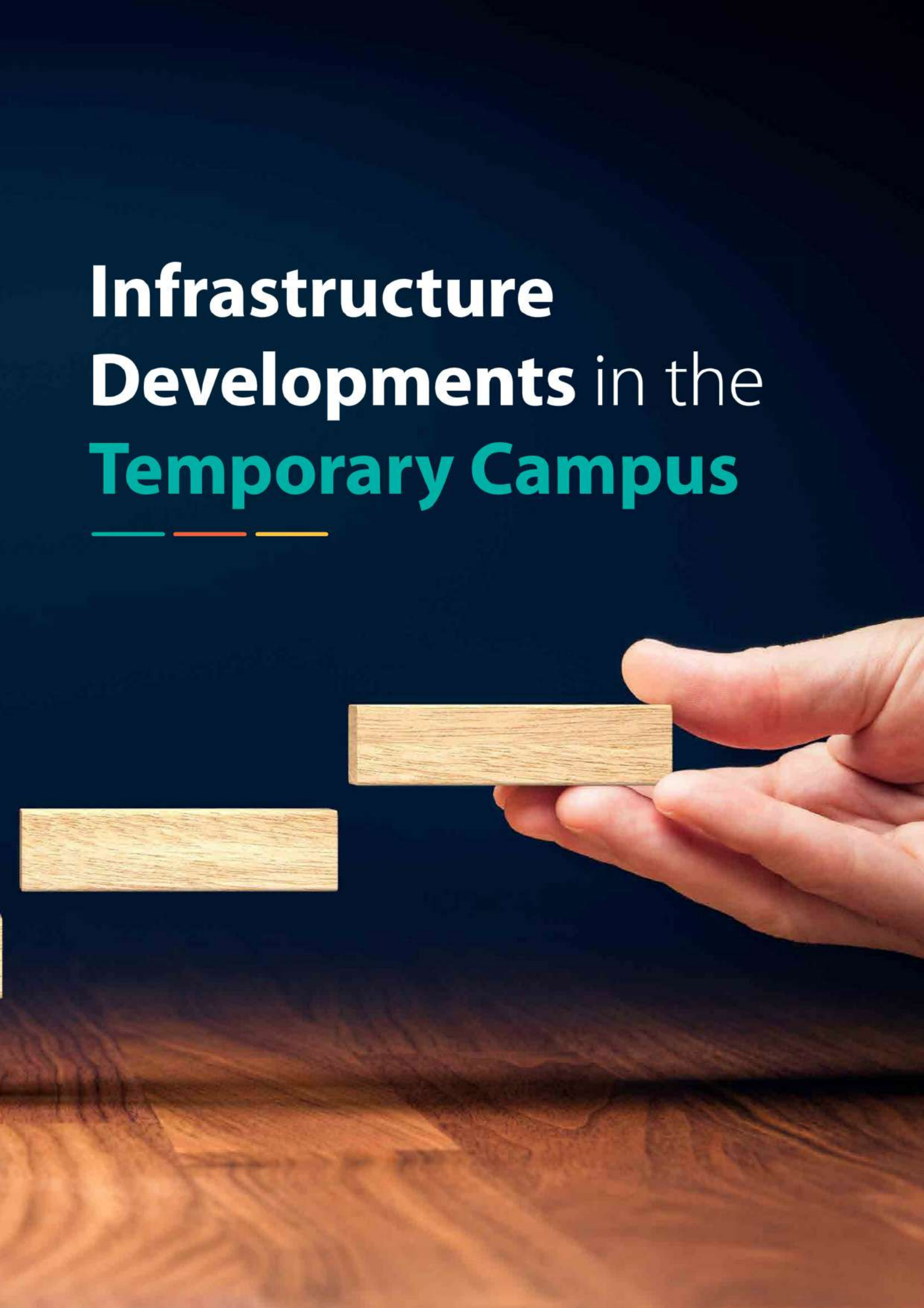
For regular indoor games and sports activities, every hostel has facilities of Table Tennis and Carrom Board. In addition, there are two play grounds inside the campus where student can play Football, Volleyball, Kho-Kho, and Cricket. A well-maintained indoor Badminton Court is also there inside the old Academic Building. All fields and court are having proper lightning facilities for the convenience and to play at night.

Students also participate in the different Inter-NIT tournaments hosted by several NITs at different parts of the country to improve their performance every year.

Well-equipped gymnasium is there for the Boys inside the campus where all the modern gymnasium equipments are housed. A separate gymnasium is also maintained in parallel to cater the needs of the Girl students.

Further, Annual Sports Meet of the Institute is organized every year to motivate students in games, sporting activities. A number of athletic events along with all the indoor and outdoor games and sports events are also organized. However, this year we could not organize the Annual Sports Meet due to the COVID-19 pandemic.

# **Infrastructure Developments** in the **Temporary Campus**



Due to lack of space and extreme climatic condition in the temporary site of the Institute, sufficient number of classrooms as well as labs were not available, thus efforts have been made to create a minimum infrastructure, necessary for smooth functioning of the Institute. In addition, regular repair / maintenance works of existing structures are carried out. The Estate Section of NIT Sikkim manages all infrastructure related activities. The Institute has been operating from the temporary site since the last 11 years and the campus is in need for regular repairs and maintenance to discharge the necessary academic and administrative activities. Further, with the approval of the BWC and the BoG, constructions of temporary sheds are initiated to provide the necessary and basic laboratories / class rooms and other infrastructure. In the year 2020-21, the Institute has taken up the following projects, which are either under construction or completed:

## a) Fabrication of Transportation and WRE Laboratory Sheds for the Department of Civil Engineering

The Department of Civil Engineering is not able to provide basic Laboratory facilities to its students as per the curriculum due to non-availability of spaces for laboratories. The students are in demand of better academic facilities especially Labs and the institute does not have proper space for the above. Due to lack of Labs, students have to travel to some IIT / NIT, which is time consuming and risky especially in the monsoon season. In view of this and to meet the urgent requirement of Laboratory, fabrication of sheds near the Academic Building was essential and hence is carried out. These works were executed in-house by Estate Department under the supervision of Civil and Mechanical departments. The picture of this newly constructed Laboratory Shed is given in Fig.1.

*Fig.1 Fabrication of Laboratory Shed for Civil Engineering Department*

## b) Fabrication of Sheds for Girls' Kitchen and Dining

NIT Sikkim is functioning from the temporary campus and there are limited number of hostel rooms for Girls' students. As the hostel did not have a proper Mess facility, two rooms of the existing Girls' hostel were being used as a makeshift kitchen, etc. Since last few Academic Sessions the strength of in-coming girls' students has been increasing. Therefore, in order to accommodate more girl students in the existing Girls' hostel, it was proposed to vacant the existing mess. With reference to this a shed near the Girls Hostel has been fabricated to create space for Kitchen, Dining and Girls' Gym. The work has been carried out in-house by the Estate Department and the pictures of these newly constructed sheds are given in Fig.2.


*Fig.2 Fabrication of Shed for Girls' Kitchen and Dining*

## (c) Refurbishment of Medical Unit

The Medical Unit at the campus was housed in one small apartment. There was an acute shortage of space and had other maintenance requirements. As per the request received from the Faculty In-charge, Medical Unit refurbishment was urgently required as it doesn't have adequate facilities. The floor of the Medical Unit was damaged and tiling work was needed. There was also a requirement for arrangement of storage, dressing area, painting, repair and maintenance of drainage, walls etc. The work has been executed in-house by the Estate Section and the pictures of the same are given in Fig.3.


*Fig.3 Refurbishment of Medical Unit*

## (d)Refurbishment of Faculty Mess

The Faculty / Staff Mess at the campus had limited space for dining / cooking and were in poor condition. As per the request received from Faculties and Staff, the refurbishment work of the Mess has been carried out. The work has been executed in-house by the Estate Section and the pictures of the same are given in Fig.4.


*Fig.4 Refurbishment of Faculty Mess*

## (e)Repair and Maintenance at various places of the Campus

NIT Sikkim is running from a temporary campus at Ravangla, South Sikkim. Ravangla witnesses heavy rainfalls which last for around 6 to 7 months in a year and due to this most of the footpaths and parking spaces of the campus are completely damaged. At various places, it had become slippery and was dangerous to walk. Therefore, it was required to carry out the Repair and Maintenance work of the footpath and parking space by laying Paver blocks and tiles.

## (f) Construction of Prefabricated Shed-III (Structural Engineering & CAD/CAM Lab)

NIT Sikkim is functioning from a temporary campus located at Ravangla, South Sikkim. There is scarcity of built-up space for basic laboratories for the students. The students are in demand of more space for Laboratories and Institute does not have proper space for the same. In view of this CPWD was assigned to construct prefabricated sheds (Shed-I, Shed-II and Shed-III) for Laboratories and academic purpose. The construction work of prefabricated Shed-III has been completed by CPWD and now is used as Structural Engineering and CAD / CAM Laboratories. The picture of the same is given in Fig.6.

*Fig.5 Prefabricated Shed-III*

## (g)Construction Work at Shed-II

The construction work of Prefabricated Shed-II is in progress since 2015- 2016 and has not been completed by CPWD till date in spite of several requests and constant persuasion. The progress of the work had been reviewed by the Estate Section and discussed with CPWD. Based on the response and the urgent requirement to make the Shed-II usable, partition work needs to be done at the earliest. A staircase along with ramp is also necessary to be constructed for easy access to the shed from the Approach Road. Other Miscellaneous works are also required to protect the Prefab structure and make the Shed accessible to students. The CPWD explicitly conveyed its inability to undertake the abovementioned works and requested the Institute to complete it.With reference to the request received from CPWD and also considering the urgency, the work has been taken up by the Estate Department of NIT Sikkim under the supervision of Civil Departments. The works are in progress and the pictures of the same is given in Fig.7.

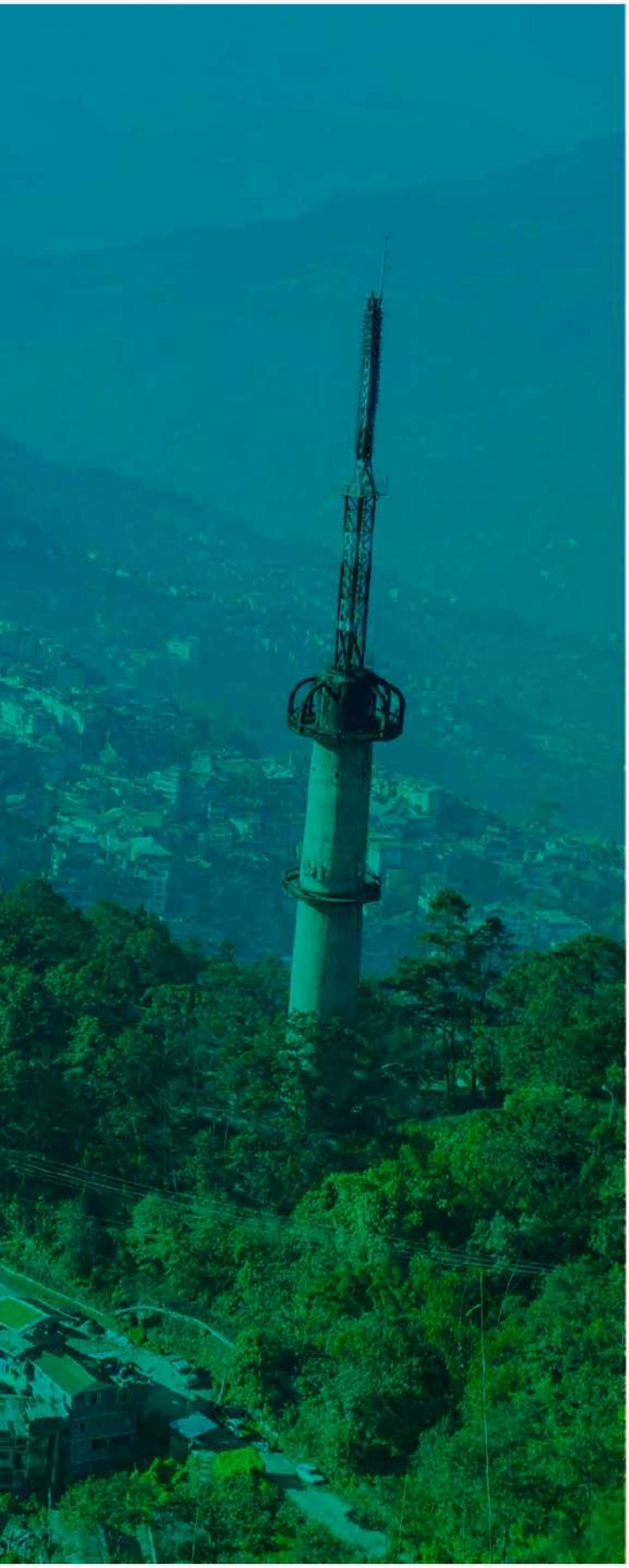
*Fig.6 Under construction Prefabricated Shed-II*

## h) Setting up of Conference Room

A new Conference / Meeting Room have been set up in the Admin Building of the Institute. It is equipped with state-of-the-art video conferencing facility with a seating capacity of 40. It has been extensively used post the pandemic to host Virtual Conferences, Seminars, Workshops, Expert Lectures and Meetings etc. A few photographs of the room are given below:

*Fig.7 Conference / Meeting Room*


Central
Library



The Central Library is an integral part of academic and research activities for NIT Sikkim. It was established in 2012 as the Knowledge and Information Center, providing access to scholarly information, research support, and study facilities. It aims to offer effective services to its users for the fulfillment of their learning needs through its necessary facilities. It has been growing and expanding in the aspect of collection of recourses both in the print and digital forms to meet the requirements of the academic fraternity and students of NIT Sikkim. The library is providing various services to the patrons such as circulation of text and reference books, photocopy, printing and scanning services to mention a few. However, the space is highly limited and needs immediate solution to house more learning resources and access for students. Some of the facilities are summarized as follows:

## Collection

Central Library has print as well as electronic resources in its collection. It has a good collection of text books, reference books, encyclopedias, dictionaries, Journals / Magazines.

It possesses rich electronic resources to meet the requirement of respective departments including both Engineering as well as basic Science departments such as Springer-Nature, ACM Digital Library, NDLe-Resources. It also has access to a number of titles of e-books.

## Other Facilities

It is well-equipped with photocopy, printing and scanning facilities. Library is automated with Koha which is an open source Integrated Library System (ILS). Circulations of books are executed through the barcode system. Despite space limitations, special arrangement is made for a reading room for students at the multi-purpose hall. Proper room heating facilities are provided so that students can utilize the library facilities during evening / night time. The Central Library of NIT Sikkim is also dedicated to provide the Book Bank services throughout the years.

The library of NIT Sikkim is also providing various optional books to read apart from the core academic subjects.



## Library facilities

Collections of books; students' extended reading space with room heating facility; photocopy, printing and scanning facilities.

# **Research** and **Innovation**

NIT Sikkim is focusing on its contribution to different Research and Innovation works. The Faculty Members are encouraged to take up projects related to development of the Virtual Laboratory to support students during the COVID 19 pandemic situations. Moreover, NIT Sikkim became the Nodal Center for the 'Virtual Labs' which is an Initiative of Ministry of Education under the National Mission on Education through ICT.

The Innovation Cell encourages and supports students to explore their technical creativity. Students were engaged in innovative works and the Institute supports them to showcase their talents. Dr. Anjan Kumar Ray is nominated for the National Innovation and Startup Policy (NISP) for implementation programme of MoE Innovation Cell and AICTE. An Institute Committee is formed for implementation of NISP to support the mission of NEP 2020.

B.Tech. Student Mr. Pravesh Sharma participated in the India International Science Festival 2020 (IISF 2020) under the category of Student Engineering Model Competition during 22nd December, 2020 to 25th December, 2020. The Programme was jointly organized by Ministry of Science and Technology, Ministry of Earth Sciences, Ministry of Health and Family Welfare, Vijnana Bharati (VIBHA) and CSIR. Another B.Tech. Student Mr. Sourav Kumar became the winner at the Innovative Futuristic Product Prototype International Challenge organized by the IIC-SMIT in association with AIC-SMUTIB from 12th October, 2020 to 19th February, 2021.

The UG Students are also encouraged to be engaged in Research Work along with Faculty Members. Their active participations also resulted into publications in reputed venues. A few examples of such acceptance are as follows:

P. K. Keserwani, V. Jha, M. C.Govil, and E. S. Pilli, Clickedroid: A Methodology based on Heuristic Approach to Detect Mobile Ad-Click Frauds, International Conference on Paradigms of Computing, Communication and Data Sciences (PCCDS-2020), 2020, NIT Kurukshetra.

D. Verma, S. Adhikari, and S. Ray, Forwarding Strategy in SDN based Content Centric Network, International Conference on Paradigms of Communication, Computing and Data Sciences (PCCDS 2021), NIT Kurukshetra (accepted).

NIT Sikkim also signed a MoU as a Member Institute with IIT Kanpur for the Centre for Ganga River Basin Management and Studies (cGanga). The objectives of cGanga are creation and dissemination of knowledge and information for the sustainable development of Ganga River Basin to support the National Mission for Clean Ganga (NMCG), Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR), Government of India.

Presently, thirty sponsored projects are in progress in the Institute. Sponsoring Agencies are DST, MeitY, ICSSR, MoEF&CC, and TEQIP III. NIT Sikkim is also part of the Visvesvaraya Ph.D. Scheme Project. Presently four students are pursuing Ph.D. through Visvesvaraya Ph.D. Scheme. Faculty Members have also submitted several research proposals as calls from funding agencies like SERB, DBT, DSTas well as special calls for COVID-19.

The departments of CSE (PI Dr. Sangram Ray), EEE (PI Dr. Molay Roy and Co-PI Dr. Aurobinda Panda) and HSS (PI Dr. Dhananjay Tripathi) received Research Project Funding from MeitY, NaMPET-III (MeitY), and ICSSR respectively. The sanctioned amounts are Rs. 67.69 Lakhs, Rs. 61.67 Lakhs, and Rs. 2.50 Lakhs respectively.

Total number of Ph.D. Scholars who are enrolled is fifty three (53) among which 40 are Male and 13 are Female Scholars Despite severe scarcity of resources, the Faculty Members and Scholars are engaged in high-end research works which are evident from their efforts and publications in top-class Journals and Conferences. The members of NIT Sikkim contributed to 91 Journal Papers, 34 Conference Papers, 20 Book Chapters and 1 Book.

Institute needs to develop Research Facilities and environment for continuous growth through encouragement for top-end research.A number of project works which are ongoing at NIT Sikkim are mentioned below:

# Research Projects

1. SMDP-C2SD: Design of Class C Power Amplifier as an individual project for RF Applications

   **Principal Investigator :** Prof. Mahesh Chandra Govil

   **Funding Agency :** The Ministry of Electronics and Information Technology (MeitY)

2. Visvesvaraya Project: Content Centric Network - its security aspects and design of some security solutions using Elliptic Curve Cryptography

   **Principal Investigator :** Dr. Sangram Ray

   **Funding Agency :** The Ministry of Electronics and Information Technology (MeitY)

3. Visvesvaraya Project: Design of a secured Border Gateway Protocol and Router

   **Principal Investigator :** Dr. Shefalika Ghosh Samaddar

   **Funding Agency :** The Ministry of Electronics and Information Technology (MeitY)

4. Visvesvaraya Project: Design of Frequency Synthesizer and VCO for RF Applications

   **Principal Investigator :** Dr. Sanjay Kumar Jana

   **Funding Agency :** The Ministry of Electronics and Information Technology (MeitY)

5. Visvesvaraya Project: Intelligent Networked Robotic Systems

   **Principal Investigator :** Dr. Anjan Kumar Ray

   **Funding Agency :** The Ministry of Electronics and Information Technology (MeitY)

6. Innovative and sustainable decision support system for drinking water security in Indian Himalayan region of Sikkim and West Bengal

   **Principal Investigator :** Dr. Md Nurujjaman

   **Funding Agency :** The Ministry of Environment, Forest & Climate Change (MoEF&CC)

7. The occult tradition of Shamanism in Sikkim: A Study of its belief and tribal nature

   **Principal Investigator :** Dr. Dhananjay Tripathi

   **Funding Agency :** Indian Council of Social Science Research (ICSSR)

8. Development of efficient and secure Content Centric Network (CCN) Architecture with Communication Protocols using Elliptic Curve Cryptography (ECC)

   **Principal Investigator :** Dr. Sangram Ray

   **Funding Agency :** Department of Science and Technology (DST)

9. Design and Development of WBG device based High Current Converters for Industry Applications – WBG-CONV

   **Principal Investigator :** Dr. Molay Roy, Co-PI: Dr. Aurobinda Panda

   **Funding Agency :** NaMPET Ph-III, Ministry of Electronics and Information Technology (MeitY)

10. Covid-19 and its impact on Sikkim: A Study of how and why Sikkim become an exception

    **Principal Investigator :** Dr. Dhananjay Tripathi

    **Funding Agency :** Indian Council of Social Science Research (ICSSR)

11. Design of efficient and secure Internet of Things (IoT) Communication Framework in context of Content Centric Network (CCN) using Elliptic Curve Cryptography (ECC) – A next generation smart communication technology

    **Principal Investigator :** Dr. Sangram Ray

    **Funding Agency :** Ministry of Electronics & Information Technology (MeitY)

12. The following Projects were approved under TEQIP-III

| Sl. No. | Name of the Project | Name of the Principal Investigator(s) |
|---|---|---|
| **Department of Computer Science and Engineering** | | |
| 1 | Design and development of scheme(s) for handling flash crowd in live video streaming in Peer-to-Peer network | PI: Prof. M. C. Govil<br>Co-PI: Dr. Kunwar Pal |
| 2 | Development of particle swarm optimization based scheme(s) for improving coverage and connectivity in mobile wireless sensor networks | PI: Dr. Pratyay Kuila |
| 3 | Design of efficient and secure key management scheme for Internet of Things (IoT) using elliptic curve cryptography (ECC) | PI: Dr. Sangram Ray |
| 4 | Design of an approach for monitoring of water quality in large reservoir using underwater sensor network | PI: Prof. M. C. Govil<br>Co-PI: Mr. Gajendra Singh Shekhawat |
| **Department of Electrical and Electronics Engineering** | | |
| 5 | Development of a prototype of a quadruped and a high dexterity robotic platform | PI: Dr. Anjan Kumar Ray |
| 6 | Development of integrated power quality based photovoltaic distributed generation system | PI: Dr. Aurobinda Panda |
| 7 | Design and Development of cascaded multi-level inverter for industry applications | PI: Dr. Molay Roy |
| **Department of Electronics and Communication Engineering** | | |
| 8 | Design of an all rate clock divider without a phase mismatch or duty cycle distortion | PI: Dr. Sanjay Kumar Jana |
| 9 | Design and development of high gain ultra-wideband antenna with sharp multiple notches for surface penetrating radar application | PI: Dr. Surajit Kundu |

**Department of Mechanical Engineering**

| | | |
|---|---|---|
| 10 | Analysis of atmospheric boundary layer using enhanced wall function and improved inlet condition | PI: Dr. Ranjan Basak |
| 11 | Design and development of Solar-PV based winter air conditioning system for typical classrooms | PI: Dr. Shambhunath Barman<br>Co-PI: Dr. Pradip Mondal |

**Department of Physics**

| | | |
|---|---|---|
| 12 | Investigation of "shared purity" of quantum states | PI: Dr. Anindya Biswas |
| 13 | Identification of earthquake-induced anomalies in complex soil Rn-222 Time Series | PI: Dr. Md. Nurujjaman |

**Department of Chemistry**

| | | |
|---|---|---|
| 14 | Synthesis of Condensed Heterocycles with Bioactive Potential | PI: Dr. Taraknath Kundu<br>Co-PI: Dr. Nidhi Govil |
| 15 | Bioinspired Metal Complex as Electrocatalysts for Oxygen Reduction Reaction | PI: Dr. Achintesh Narayan Biswas<br>Co-PI: Dr. Nidhi Govil |
| 16 | Medicinally potent Biologically Active Macrolactone: Initiative to Search Industrial Scale Synthesis | PI: Dr. Sumit Saha |

**Department of Mathematics**

| | | |
|---|---|---|
| 17 | Hybrid Production System with Uncertain Return Quality and Different Remanufacturing Policies | PI: Dr. Om Prakash |
| 18 | On Corona Product of Signed Graph with Respect to HK Marking | PI: Dr. Ravi Srivastava |

**Department of Humanities and Social Science**

| | | |
|---|---|---|
| 19 | The Significance of PASHU (Animals) in Indian Mythology and Culture | Dr. Dhananjay Tripathi |

# Research Publications

## Computer Science and Engineering

### International Book Chapters

1. Subash Harizan, and Pratyay Kuila, "Nature-Inspired Algorithms for *k*-Coverage and *m*-Connectivity Problems in Wireless Sensor Networks," *Chapter* 8 in *Design Frameworks for Wireless Networks, Lecture Notes in Networks and Systems* (*Springer*), Vol. 82, pp 281-301, (2020). ISBN 978-981-13-9573-4

2. Subash Harizan, and Pratyay Kuila, "Evolutionary Algorithms for Coverage and Connectivity Problems in Wireless Sensor Networks: A Study," *Chapter* 9 in *Design Frameworks for Wireless Networks, Lecture Notes in Networks and Systems* (*Springer*), Vol. 82, pp 257-280, (2020). ISBN 978-981-13-9573-4

3. Pratyay Kuila and Prasanta K. Jana, "Evolutionary Computing Approaches for Clustering and Routing in Wireless Sensor Networks," *Chapter* 6 in *Sensor Technology: Concepts, Methodologies, Tools, and Applications* (*IGI Global*), pp 125-146, (2020). ISBN13: 9781799824541, ISBN10: 1799824543

4. Ghosh, C., Majumder, S., Ray, S., Datta, S., & Mandal, S. N. "Different EDGE Detection Techniques: A Review." *Electronic Systems and Intelligent Computing* (2020): 885-898.

### International Journals

1. Subash Harizan, and Pratyay Kuila, "A novel NSGA-II for coverage and connectivity aware sensor node scheduling in industrial wireless sensor networks," *Digital Signal Processing* (*Elsevier*), Vol. 105, 102753 (2020). (Impact Factor: 3.381)

   https://doi.org/10.1016/j.dsp.2020.102753

2. Tarun Biswas, Pratyay Kuila and Anjan Kumar Ray, "A Novel Workflow Scheduling with Multi-Criteria using Particle Swarm Optimization for Heterogeneous Computing Systems," *Cluster Computing* (*Springer*), Vol. 23, pp. 3255–3271 (2020). (Impact Factor: 1.809)

   https://doi.org/10.1007/s10586-020-03085-3

3. Subash Harizan, and Pratyay Kuila, "Coverage and Connectivity Aware Critical Target Monitoring for Wireless Sensor Networks: Novel NSGA-II-Based

Approach," *International Journal of Communication Systems* (*Wiley*), Vol. 33, No. 4, e4212 (2020). (Impact Factor: 2.047)

4. Dipanwita Sadhukhan, Sangram Ray, Mohammad S. Obaidat and Mou Dasgupta, "A Secure and Privacy Preserving Lightweight Authentication Scheme for Smart-grid Communication Using Elliptic Curve Cryptography", Journal of System Architecture, Elsevier, November 2020, Published online (https://doi.org/10.1016/j.sysarc.2020.101938) (SCI, 2019 Impact Factor - 2.552)
5. Suman Mazumder, Sangram Ray, Dipanwita Sadhukhan, M.K. Khan and Mou Dasgupta, "ECC-CoAP: Elliptic Curve Cryptography based Constraint Application Protocol for Internet of Things", Wireless Personal Communications, Springer, Accepted in July 2020 (https://doi.org/10.1007/s11277-020-07769-2).(SCI, 2019 Impact Factor - 1.061)
6. Dipanwita Sadhukhan, Sangram Ray, G.P. Biswas, M.K. Khan and Mou Dasgupta, "A Lightweight Remote User Authentication Scheme for IoT Communication Using Elliptic Curve Cryptography", Journal of Supercomputing, Springer, May 2020, Published online (https://doi.org/10.1007/s11227-020-0338-7). (SCI, 2019 Impact Factor - 2.469)
7. Sharmistha Adhikari, Sangram Ray, M.S. Obaidat, and G.P. Biswas, "Efficient and Secure Content Dissemination Architecture for Content Centric Network using ECC-based Public Key Infrastructure", Computer Communications, Elsevier, May 2020, vol. 157, pp. 187-203. (SCI, 2019 Impact Factor - 2.816)
8. K Sowjanya, Mou Dasgupta, Sangram Ray and M. S. Obaidat, "An Efficient Elliptic Curve Cryptography Based Without Pairing KPABE for Internet of Things", IEEE Systems Journal, IEEE, June, 2020, vol. 14, no. 2, pp. 2154-2163. (SCI, 2019 Impact Factor - 4.463)
9. Bhaumik, Gopa, and Mahesh Chandra Govil. "Conserving Thangka– A technical approach unto the preservation of Buddhist Thangka through automation." *Digital Applications in Archaeology and Cultural Heritage* 18 (2020): e00149.
10. Keserwani, Pankaj Kumar, Mahesh Chandra Govil, and Emmanuel S. Pilli. "An Optimal Intrusion Detection System using GWO-CSA-DSAE Model." *Cyber-Physical Systems* (2020): 1-24.
11. Chawla, Tanvi, et al. "Storage, partitioning, indexing and retrieval in Big RDF frameworks: A survey." *Computer Science Review* 38 (2020): 100309.

## International Conferences

1. Tarun Biswas and Pratyay Kuila, "Particle Swarm Optimization based Multi-criteria Scheduling for Multi-Core Systems," *ICEEE* 2020, *IEEE Xplore*, pp. 115-120, (2020). (Best paper award)
2. Pintu Kumar Ram, Nabendu Bhui, and Pratyay Kuila, "Gene Selection from High Dimensionality of Data Based on Quantum Inspired Genetic Algorithm," 11th *International Conference on Computing, Communication and Networking Technologies* (*ICCCNT* 2020), *IEEE Xplore*, (2020). DOI: 10.1109/ICCCNT49239.2020.9225512
3. Nabendu Bhui, Pintu Kumar Ram, and Pratyay Kuila, "Feature Selection from Microarray Data based on Deep Learning Approach," 11th *International Conference on Computing, Communication and Networking Technologies* (*ICCCNT* 2020), *IEEE Xplore*, (2020). DOI: 10.1109/ICCCNT49239.2020.9225353
4. Nabendu Bhui, Dusayanta Prasad, Avishek Sinha and Pratyay Kuila, "Design of an Automatic Reader for the Visually Impaired Using Raspberry Pi," *Proc. of the International Conference on Paradigms of Computing, Communication and Data Sciences* (*PCCDS* 2020), pp 175-188 (2021) DOI: https://doi.org/10.1007/978-981-15-7533-4_14
5. Majumder, S., Ray, S., Ghosh, C., & Datta, S., "Usage of Internet of Things in Home Automation Systems: A Review." *Modeling, Simulation and Optimization: Proceedings of CoMSO* 2020. Springer Singapore, 2021.
6. Bhaumik, G., Verma, M., Govil, M. C., & Vipparthi, S. K. (2020, July). EXTRA: An Extended Radial Mean Response Pattern for Hand Gesture Recognition. In 2020 International Conference on Communication and Signal Processing (ICCSP) (pp. 0640-0645). IEEE.
7. Bhaumik, G., Verma, M., Govil, M. C., & Vipparthi, S. K. (2020, Nov). CrossFeat: Multi-scale Cross Feature Aggregation Network for Hand Gesture Recognition. In 15th International Conference on Industrial and Information Systems (ICIIS) 2020. IEEE. (Best Paper Awarded)
8. Bhaumik, G., Verma, M., Govil, M. C., & Vipparthi, S. K. (2020, Dec). Att-PyNet: An Attention Pyramidal Feature Network for Hand Gesture Recognition. In 26th Annual International Conference on Advanced Computing and Communications.
9. Bhaumik, G. and Govil, M. C. (2020, July). Buddhist Hasta Mudra Recognition Using Morphological Features. In International Conference on Machine Learning, Image Processing, Network Security and Data Sciences, pp. 356-364. Springer, Singapore, 2020.

10. Keserwani, Pankaj Kumar, and Mahesh Chandra Govil. "A Hybrid Symmetric Key Cryptography Method to Provide Secure Data Transmission." *International Conference on Machine Learning, Image Processing, Network Security and Data Sciences*. Springer, Singapore, 2020.

11. Keserwani, Pankaj Kumar, Mahesh Chandra Govil, and Pilli Emmanuel Shubhakar. "Evidence Building for Ad Click or Web Access on Cloud." *International Conference on Machine Learning, Image Processing, Network Security and Data Sciences*. Springer, Singapore, 2020.

12. Agarwal, Madan M., Hemraj Saini, and Mahesh Chandra Govil. "Probabilistic and Fuzzy based Efficient Routing Protocol for Mobile Ad Hoc Networks." *Recent Advances in Computer Science and Communications (Formerly: Recent Patents on Computer Science)* 13.3 (2020): 422-432.

## Department of Electronics and Communication Engineering

### Journals

1. Suparna Ballav, Ayan Chatterjee and Susanta Kumar Parui, "Gain augmentation of a dual-band dielectric resonator antenna with frequency selective surface superstrate", International Journal of RF and Microwave Computer-Aided Engineering, vol. 31, no. 4, e22575, 2021. DOI: https://doi.org/10.1002/mmce.22575

2. Surajit Kundu and Ayan Chatterjee, "Sharp Triple-Notched Ultra Wideband Antenna with Gain Augmentation Using FSS for Ground Penetrating Radar", Wireless Personal Communications, November 2020. DOI: https://doi.org/10.1007/s11277-020-07928-5

3. Anik Naha Biswas, Suparna Ballav, Ayan Chatterjee and Susanta Kumar Parui, "Evolution of Low-Profile Ultra-Wideband Frequency Selective Surface with a Stable Response and Sharp Roll-Off at Lower Band for C, X and Ku Band Applications", Radioengineering, vol. 29, no. 3, pp. 494-503, September 2020. DOI: 10.13164/re.2020.0494

4. Surajit Kundu, Ayan Chatterjee, and Amjad Iqbal, "Printed circular ultra-wideband antenna with triple sharp frequency notches for surface penetrating radar application", Sadhana, vol. 45:97, 2020. DOI: https://doi.org/10.1007/s12046-020-01341-1.

5. Surajit Kundu, "High gain compact ultra-wideband "antenna-frequency selective surface" and its performance evaluation in proximity of soil surface," Microwave and Optical Technology Letters, vol. 63, no. 3, 2021, pp. 869-875.

6. Surajit Kundu, "Gain Augmentation of a Triple Notched Ultra-wideband Antenna using Compact Uniplanar Frequency Selective Surface for Ground Penetrating Radar," IETE Journal of Research, 2020, pp. 1-12.

7. Surajit Kundu, "A compact printed ultra-wideband filtenna with low dispersion for WiMAX and WLAN interference cancellation." Sādhanā, vol. 45, no.1, 2020, pp. 1-7.

8. Surajit Kundu, "A compact uniplanar ultra-wideband frequency selective surface for antenna gain improvement and ground penetrating radar application." International Journal of RF and Microwave Computer-Aided Engineering, vol. 30, no. 10, 2020, e22363.

9. Dhara, R. 2021. Design of a miniaturized CPW fed Z-shaped monopole antenna using theory of characteristics modes for bandwidth enhancement. Sādhanā 46, 87. DOI: 10.1007/s12046-021-01610-7. (SCIE indexed)

10. Dhara, Reshmi,* Yadav, S., Sharma, M.M., Jana, S.K. and Govil, M.C., 2021. A Circularly Polarized Quad-Band Annular Ring Antenna with Asymmetric Ground Plane Using Theory of Characteristic Modes. Progress in Electromagnetics Research, 100, pp.51-68. DOI: 10.2528/PIERM20102006. (ESCI indexed)

11. Dhara, R., 2021. A Compact Dual Band Dual Polarized Monopole Antenna with Enhanced Bandwidth for C, X, and Ku Band Applications. Progress in Electromagnetics Research Letters, 96, pp.65-72. DOI: 10.2528/PIERL20121903. (ESCI indexed)

12. Jaiverdhan,* Sharma, M.M., Yadav, R.P. and Dhara, Reshmi, 2020. Characteristic Mode Analysis and Design of Broadband Circularly Polarized CPW-Fed Compact Printed Square Slot Antenna. Progress In Electromagnetics Research - M, 94, pp.105-118. DOI: 10.2528/PIERM20051206. (ESCI indexed)

13. Dhara, Reshmi,* Kundu. T., 2021. A Compact Dual-Band Circularly Polarized Inverted Y- Shaped Printed Monopole Antenna with Edge Ground. Radioelectronics and Communications Systems. (SCOPUS indexed; Springer) (Accepted)

14. Dhara, R., and Kundu, T., 2021. A Dual-Band Dual Mode Antenna with Polarization Diversity. Radioelectronics and Communications Systems. (SCOPUS indexed; Springer) (Accepted)

15. Dhara, R. and Kundu, T., 2020. A Novel Quad-Band Circularly Polarized Planar Slot Antenna using Triple Strips. Authorea Preprints. DOI: 10.22541/au.158359732.22079718.

16. Dhara, Reshmi,* Jana, S.K. and Mitra, M., 2020. Tri-band circularly polarized monopole antenna for wireless communication application. Radioelectronics and Communications Systems, 63(4), pp.213-222. DOI: 10.3103/S0735272720040044. (SCOPUS indexed; Springer)
17. Dhara, Reshmi,* and Mitra, M., 2020. "A triple-band circularly polarized annular ring antenna with asymmetric ground plane for wireless applications." Engineering Reports 2(4) (2020): e12150. DOI: 10.1002/eng2.12150. ESCI-Willey index.
18. Dhara, Reshmi,* and Kundu, T., 2020. A compact inverted Y-shaped circularly polarized wideband monopole antenna with open loop. Engineering Reports, 2 (2020): p.e12326. DOI: 10.1002/eng2.12326. ESCI-Willey index.
19. Dhara, Reshmi,* 2020. Quad-band circularly polarized CPW-fed G-shaped printed antenna with square slot. Radioelectronics and Communications Systems, 63(7), pp.376-385. DOI: 10.3103/S0735272720070055. (SCOPUS indexed; Springer)
20. N. Pradhan, S. K. Jana, "Design of phase frequency detector with improved output characteristics operating in the range of 1.25 MHz -3.8 GHz," Analog Integr. Circuits and Signal Processing, 107, pp. 101-108, 2021. doi.org/10.1007/s10470-020-01779-7. (SCI)
21. Priti Gupta, Sanjay Kumar Jana, "Design of High Gain Folded Cascode OTA based Transconductance-Capacitance Loop Filter for PLL Applications," Journal of Circuits Systems and Computers, Accepted on 6 April 2021.
22. S. Garnaik, A, Kumar, G. Pradhan and K. Sethi, "An efficient approach for detecting vowel onset and offset points in speech signal" International Journal of Speech Technology (Springer), July 2020, 1-9.

## Conference

1. Surajit Kundu, "Gain Improvement of Ultra-Wideband antenna using compact Frequency Selective Surface." In 2020 URSI Regional Conference on Radio Science (URSI-RCRS), pp. 1-4. IEEE, 2020.
2. Somnath Mahato, Gopal Shaw, AtanuSantra, Sukabya Dan, Surajit Kundu, and Anindya Bose. "Low Cost GNSS Receiver RTK Performance in Forest Environment." In 2020 URSI Regional Conference on Radio Science (URSI-RCRS), pp. 1-4. IEEE, 2020.
3. Raj Ratnam, Ambati Hemasree, Somnath Mahato, Surajit Kundu, and Ayan Chatterjee. "A Cross-Dipole Shaped Patch-Slot-Patch Bandpass Frequency Selective Surface." In 2020 URSI Regional Conference on Radio Science (URSI-RCRS), pp. 1-3. IEEE, 2020.
4. Atanu Santra, Sukabya Dan, Somnath Mahato, P. Banerjee, Surajit Kundu, and Anindya Bose. "A Low-cost Approach towards Ionospheric Probing Using Compact GNSS Receivers." In 2020 URSI Regional Conference on Radio Science (URSI-RCRS), pp. 1-4. IEEE, 2020.
5. Dhara, Reshmi,* Yadav, S., Sharma, M.M., Jana, S.K. and Govil, M.C., 2021. A Circularly Polarized Quad-Band Annular Ring Antenna with Asymmetric Ground Plane using Theory of Characteristic Modes. Students' Research Convention'21 (SRC'21). (presented on 28th March 2021 at Indian Institute of Technology Kanpur, Kalyanpur, Kanpur, Uttar Pradesh 208016)
6. Dhara, R; 2020, October. Circular Polarized Octal Band CPW- Fed Antenna using Theory of Characteristic Mode for Wireless Communication Applications. In Workshop on Machine learning, Deep learning and Computational Intelligence for wireless communication (MDCWC2020) (presented on 23rd October' 2020 at National Institute of Technology Tiruchirappalli -620015, India)
7. Dhara, R, Kundu, T. and Jana, S.K., 2020. October. Dual-Band Dual Polarized Circularly Polarized and Linearly Polarized L-Shaped Patch Antenna Loaded with Strip and Square Slot. In 4th International Conference on Optical & Wireless Technologies (OWT 2020) (presented on 3rd October, 2020 at Malaviya National Institute of Technology Jaipur (MNIT Jaipur), Jaipur-302017, (Rajasthan), INDIA).
8. Dhara, R., Gupta, S.K., Jana. S.K; 2020, "Design of Dual-Band Wide Slot Monopole Antenna", International Journal of Distributed Computing and Technology, 6 (1), 1-11.
9. Dhara, R., Gupta, A.K., Gupta, S.K.; Jana. S.K., 2020, "Design of Wideband C-Shaped Circularly Polarized Monopole Antenna", International Journal of Mobile Computing Devices, 6 (1), 30-41.
10. Dhara, Reshmi*, 2020, October. A Wideband Monopole Microstrip Antenna Using Two Cross- Shaped Radiator. In Socio-Economic and Health Challenges due to COVID-19 and Mitigation Strategies" (SEHCM - 2020), Centre for Continuing Education, Dr B R Ambedkar National Institute of Technology, Jalandhar Punjab-144011, INDIA. (pp. 167-177).
11. Dhara, Reshmi*, Jana, S.K. and Mitra, M., 2020. CPW-Fed Triple-Band Circularly Polarized Printed Inverted C-Shaped Monopole Antenna with Closed-Loop and Two Semi-hexagonal Notches on Ground Plane. In Optical and Wireless Technologies (pp. 161-175). Springer, Singapore. DOI: 10.1007/978-981-15-2926-9_19.
12. S. Maity and S. Kumar Jana, "Design of a Low Power High Speed CML-Based Divide-by-5 Pre-Scaler in 180 nm Process Technology," 2020 IEEE Applied Signal Processing Conference (ASPCON), Kolkata, 2020, pp. 303-307, doi: 10.1109/ASPCON49795.2020.9276689.

13. N. Pradhan, K. Das, S. K. Jana and M.C. Govil, "Design of Pass Transistor based Phase Frequency Detector for Fast Frequency Acquisition Phase Locked Loop "IEEE Conf. ISDCS 2020, pp.1-4, DOI:10.1109/ISDCS49393.2020.9262982.

14. K. Das, N. Pradhan, V. Kumar and S.K. Jana," Comparison and Performance Analysis of Ring Oscillators and Current - Starved VCO in 180-nm CMOS Technology" IEEE Conf. ISDCS 2020,pp. 1- 5. DOI:10.1109/ISDCS49393.2020.9263006.

15. S. Maity, L. Kundu and S. Kumar Jana, "A Design Methodology of MOS Current Mode Logic Pre-Scaler for ZigBee Applications," In Proceedings: 2021 IEEE International Conference on Advances on Technology, Management & Education, (ICATME), Bhopal, 2021.

16. S. Maity, L. Kundu and S. Kumar Jana, "A Divide-by-5 Pre-Scaler Design Approach for 5G Applications," In: International Conference on Micro / Nanoelectronics Devices, Circuits and Systems (MNDCS), LNEE, Springer, Silchar, 2021.

17. P. Gupta, N. Pradhan and S. K. Jana, "Design of 21 GHz CMOS based Differential Class-C Power Amplifier with Balun Matching Network," Intern. Journal of Mobile Computing Devices, vol.2, no. 1, pp. 6-12, 2020.

18. Priti Gupta, Sanjay Kumar Jana, "Design of Dynamic Threshold OTA-Based Transconductance-Capacitance Loop Filter for PLL Applications," lecture notes in network and systems Springer, pp. 476-483. March 2021.

19. Hemant Kathania, Avinash Kumar and Mikko Kurimo "vowel non-vowel based spectral warping and time scale modification for improvement in children's ASR" in ICASSP (Accepted), Canada, June 2021

20. Avinash Kumar, Syed Shahnawazuddin and Waquar Ahmad "A Noise Robust Technique for Detecting Vowels in Speech Signals" in Interspeech pp. 3680-3684, China, October 2020.

21. Avinash Kumar and S. Shahnawazuddin "Robust Detection of Vowel Onset and End Points", in SPCOM pp. 1-5, Indian Institute of Science, Bangalore, July 2020.

22. Syed Shahnawazuddin, Waquar Ahmad, Nagaraj Adiga and Avinash Kumar "In-Domain and Out of Domain Data Augmentation to Improve Children's Speaker Verification System in Limited Data Scenario" in ICASSP, pp. 7554-7558, Spain, May 2020.

## Department of Electrical and Electronics Engineering

### Journal

1. A. Ghosh, A. K. Ray, M. Nurujjaman, and M. Jamshidi, "Voltage and Frequency Control in Conventional and PV Integrated Power Systems by a Particle Swarm Optimized Ziegler–Nichols based PID Controller", SN Applied Sciences, vol. 3, 314, Springer, 2021.

2. A. Singha, A. K. Ray, and A. B. Samaddar, "Neural Dynamics Based Complete Grid Coverage by Single and Multiple Mobile Robots", SN Applied Sciences, Springer, 2021.

3. T. Biswas, P. Kuila, and A. K. Ray, "Novel Workflow Scheduling with Multi-criteria using ParticleSwarm Optimization for Heterogeneous Computing Systems", Cluster Computing, vol. 23, pp. 3255-3271, Springer, 2020.

4. H. Malik and A. K. Yadav, "A Novel Hybrid Approach Based on Relief Algorithm and FuzzyReinforcement Learning Approach for Predicting Wind Speed", Sustainable Energy Technologies and Assessments, vol. 43, pp. 1-18, 2020.

5. P. Dey, A. Saha, A. Bhattacharya, and B. Marungsri. "Analysis of the Effects of PSS and Renewable Integration to an Inter-Area Power Network to Improve Small Signal Stability." Journal of Electrical Engineering & Technology vol. 15, no. 5, pp. 2057-2077, 2020.

6. A. El Aroudi, K. Mandal, M. S. Al-Numay, D. Giaouris, and S. Banerjee, "Piecewise Quadratic Slope Compensation Technique for DC-DC Switching Converters," IEEE Transactions on Circuits & Systems - I, vol. 67, no. 12, pp. 5574-5585, 2020.

7. P. Kumar, "Performances of Six-leg DSTATCOM Topology under Various SRF Algorithms" International Journal of Integrated Engineering, vol. 12, no. 8, 161-175, 2020.

8. P. Kumar, "Power Quality Investigation by Reduced Switching UPQC", European Journal of Electrical Engineering, vol. 22, no. 4-5, pp. 335-347, 2020.

9. A. Kumar, P. Kumar, "Comparative Power Quality Analysis of Conventional and Proposed Enhance SRF SOGI-FLL Control Based DSTATCOM", Journal of Engineering Research (JER), 2020.

### Conference

1. S. K. Singh, A. Agarwal, T. Kanumuri, and M. Roy, "Modelling and Controlling of Induction Heating Unit for Induction Cooking Application", Journal of Physics Conference Series, 2020.

2. C. Das, K. Mandal, and M. Roy, "Design of PV Emulator Fed MPPT Controlled DC-DC Boost Converter for Battery Charging", IEEE International Conference on Smart Technologies for Power, Energy and Control, 2020.

3. C. Das and K. Mandal, "Design and Analysis of Digitally Controlled Algorithm-in-loop Newton-Raphson Method Based PV Emulator," Innovations in Energy Management and Renewable Resources, Kolkata, 2021.

4. A. E. Aroudi, R. Haroun, K. Mandal, and M. Al-Numay, "Auto-Tuned Quadratic Slope Compensation for Current Mode Controlled DC-DC Converters," 2020 IEEE International Symposium on Circuits and Systems (ISCAS), Seville, Spain, October 10-21, 2020.
5. R. Vardhan, K. Mandal, and A. Panda, "Comparison of Incremental Current Based MPPT Algorithms for Wind Fed DC Microgrid," IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC), VNIT, Nagpur, India, September, 2020.
6. S. Priya, K. Mandal, and P. Kumar, "Automated Algorithm to Determine Design Curves in Parameter Space for Interconnected Converters," First IEEE International Conference on Smart Technologies for Power, Energy and Control (STPEC), VNIT, Nagpur, India, September, 2020.
7. M. Anand and P. Kumar, "Fuzzy Controller based Topologies of NS-UPQC and B4-UPQC", IEEE International Conference on Advent Trends in Multidisciplinary Research and Innovation (ICATMRI), pp. 1-7, 2020.
8. Anurag Tiwari, Aurobinda Panda, "CHBMLI Based PVDG System with Improved Power Quality Features and Battery Backup," in IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC), Nagpur, 25-26 Sept. 2020.
9. Roshan Pradhan, Arjun Kumar, Aurobinda Panda, "Model Predictive Control Based PVDG System With Integrated Power Quality Features," in IEEE International Conference on Power Systems Technology (POWERCON), Bangalore, 14-16 Sept.2020.
10. P. Kumar "Comparative Power Quality Analysis of SRF and UVT Control based DSTATCOM" International Online Conference on Smart Grid Energy Systems and Control (SGESC-2021), March 19-21, 2021.

### Book Chapter

1. M. S. Ghole, A. Ghosh, A. Singha, C. Das, A. K. Ray, "Self Organizing Map-Based Strategic Placement and Task Assignment for a Multi-agent System", Advances in Intelligent Systems and Computing, vol 1255, pp. 387 – 399, Springer, 2021.
2. A. Singha, A. K. Ray, A. B. Samaddar, "Neural Dynamics-based Complete Coverage of Grid Environment by Mobile Robots", Advances in Intelligent Systems and Computing, vol 1255, pp. 411 – 421, Springer, 2021.
3. M. S. Ghole, A. K. Ray, "A Neural Network Based Strategic Placement and Task Assignment for a Multi-agent System", Lecture Notes in Electrical Engineering, Vol. 686, pp. 555-564, Springer, 2020.
4. O. Singh, A. K. Yadav and A. K. Ray, "Condition Monitoring, Fault Detection and Diagnosis (FDD) of Photovoltaic System and Its Approaches", Soft Computing in Condition monitoring and diagnostics of Electrical and Mechanical System, Advances in Intelligent Systems and Computing, Vol. 1096, pp 155-167, Springer, 2020.
5. P. Dey, A. Saha, S. Mitra, B. Dey, A.w Bhattacharya, and B. Marungsri, "Improvement of Small-Signal Stability with the Incorporation of FACTS and PSS", Control Applications in Modern Power System, (Chapter 28), 2020.
6. P. Kumar, "Introduction to Renewable Energy Market and Metaheuristic Algorithms for Condition Monitoring of Photovoltaic Parameter Estimation", Metaheuristic and Evolutionary Computation: Algorithms and Applications, Studies in Computational Intelligence 916, Springer. PP. 229-250, 2020.
7. A. K. Yadav, "Novel Application of Grid Search Algorithm for Optimization of Photovoltaic-Wind-Diesel Hybrid Systems with and Without Tracking Systems for Power Generation", Metaheuristic and Evolutionary Computation: Algorithms and Applications, vol. 916, pp. 517-27, 2021.

## Department of Mechanical Engineering

### Journal

- **Mondal P.**, Ghosh S., Das S., MSW to Energy: A Novel and Sustainable Solution to Waste Management for Kolkata, India, Int. J. of Global Warming 2020, Vol. 22, Issue 3, pp 295-314; DOI: 10.1504/IJGW.2020.110867
- Santanu Sardar, **Susanta K Pradhan**, Santanu K Karmakar, Debdulal Das Experimental analysis on tribo-performance of aluminum composites. Journal of Composite Materials, 2020; DOI: https://doi.org/10.1177/0021998319900524.
- **Mondal P.**, Techno-economic and environmental performance assessment of a MSW to energy plant for Indian urban sectors, Thermal Science andEngineering Progress 2021, Vol. 21, 100777; DOI: 10.1016/j.tsep.2020.100777
- **A Virkunwar,** S Ghosh, **R Basak**, Tribological performance optimization of Al6061-Rice husk ash composites using the taguchi method and grey relational analysis, Journal of Critical Reviews 2020, Vol. 7 (15), 6277-6283; DOI: 10.31838/jcr.07.15.795
- **A Virkunwar,** S Ghosh, **R Basak,** Tribological performance optimization of Al6061-fly ash composites using the taguchi method and grey relational analysis, Materials Today: Proceedings 2021 (In press); DOI: https://doi.org/10.1016/j.matpr.2020.11.345

### Conference

- **Tewari, K.**, Dev, R., 2020, "Comparative Enviro-Economic Analysis of transparent water heating systems and conventional systems", International Conference on Future Technologies 2020 (ICoFT 2020) in Manufacturing, Automation, Design and Energy (MADE), NATIONAL INSTITUTE OF TECHNOLOGY PUDUCHERRY, Thiruvettakudy, Karaikal.
- **S Some** and SK Guha. Effect of non-Newtonian lubricant on the linear and non-linear stability analysis of the double-layered porous journal bearing. TRIBOINDIA 2020 (An International Virtual Tribology Conference), SRM Institute of Science and Technology, Tamil Nadu, India, 10th -12th December 2020.
- **A Virkunwar,** S Ghosh, **R Basak,** Wear characteristics optimization of Al6061-Sugarcane Bagasse Ash metal matrix composite using Taguchi Method, ICAMSME-2020, NBKRIST, Nellore, A.P
- **A Virkunwar,** S Ghosh, **R Basak,** Tribological performance optimization of Al6061-fly ash composites using the taguchi method and grey relational analysis, Manufacturing, Material Science & Engineering-2020, CRM institute of Technology, Hyderabad.
- S Majumdar, **SH Mullick**, D Mandal &**R Basak**, Numerical Study on Natural Convection inside Quadratic Enclosure with Uniform or Non-Uniform Heating from Below, ICESD 2021 (Accepted for Presentation)

### Book Chapter

- **Mondal P.**, Samanta S., Ghosh S., **Barman SN**, Bio-waste fired gas turbine and transcritical CO2 cycle based combined power plant: Thermodynamic, economic and environmental performance assessment. In: Advances in Thermofluids and Renewable Energy, Lecture Notes in Mechanical Engineering. Springer, Singapore. (In press)
- **Mondal P., Barman SN**, Samanta S., Integrated MSW to Energy and Hot Water Generation Plant for Indian Cities: Thermal Performance Prediction, In: Revankar S., Sen S., Sahu D. (eds) Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore. DOI: 10.1007/978-981-15-7831-1_53
- **Lakshman R.**, **Basak R.** (2020) Analysis of Transformed Sixth-Order Polynomial for the Contraction Wall Profile by Using OpenFOAM. In: Singh B., Roy A., Maiti D. (eds) Recent Advances in Theoretical, Applied, Computational and Experimental Mechanics. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-1189-9_11
- **Lakshman R., BinodJ.R.,Basak R.** (2021) Implementation of Improved Wall Function for Buffer Sub-layer in OpenFOAM. In: Revankar S., Sen S., Sahu D. (eds) Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-7831-1_6
- **Lakshman R., Pal N., Basak R.** (2021) Comparative Analysis of Inlet Boundary Conditions for Atmospheric Boundary Layer Simulation Using OpenFOAM. In: RevankarS., Sen S., Sahu D. (eds) Proceedings of International Conference on Thermofluids. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-7831-1_8
- **MullickS.H.,** Dasmahapatra S. (2020) Combined Motion Generation by Electro-Hydraulic Stewart Platform for Manufacturing Industries. In: Dawn S., Balas V., Esposito A., Gope S. (eds) Intelligent Techniques and Applications in Science and Technology. ICIMSAT 2019. Learning and Analytics in Intelligent Systems, vol 12. Springer, Cham. https://doi.org/10.1007/978-3-030-42363-6_70

## Department of Civil Engineering

### Journal Publications

1. Dutta N, Haldar A & Gupta A " Electrocoagulation for Arsenic Removal: Field Trials in Rural West Bengal" Archives of Environmental Contamination and Toxicology. Volume 80, pages248–258(2021)

### Books Published

1. Ghosh K and Ghosh P. Alkali Activated Fly Ash: Blast Furnace Slag Composites. CRC Press, Taylor and Francis, 2020, ISBN 9780367535544,https://doi.org/10.1201/9781003082460

## Department of Physics

1. **G Biswas and A Biswas**, Entanglement in first excited states of some many-body quantum spin systems: indication of quantum phase transition in finite size systems, PhysicaScripta96, 025003, 2021.
2. **A Ghosh, AK Ray, M Nurujjaman and M Jamshidi**, Voltage and frequency control in conventional and PV integrated power systems by a particle swarm optimized Ziegler–Nichols based PID controller, SN Applied Sciences 3 (3), 1-13, 2021.
3. **A Mahata, DP Bal and M Nurujjaman**, Identification of short-term and long-term time scales in stock markets and effect of structural break, Physica A: Statistical Mechanics and its Applications 545, 123612, 2020.
4. **M Nurujjaman and A Mahata**, Time scales and characteristics of stock markets in different investment horizons, Frontiers in Physics 8, 498, 2020.

## Department of Chemistry

**International Journal Publications: Twenty One (21)**

**Cumulative Impact Factor (CIF): 60.47.**

1. *A review on aluminum, gallium and indium complexes of (Ph2-nacnac) ligand,* **NidhiGovil**, and B. Jana,*InorganicaChimicaActa*, 2021, *515*, 120037. [IF: 2.046]
2. *Designed Metal-ATCUN Derivatives: Redox and Non-redox Based Applications Relevant for Chemistry, Biology and Medicine*, **Biplab K. Maiti,*NidhiGovil, TaraknathKundu**, and J. J. G. Moura, *iScience*, **2020**, 101792. [IF: 4.565]
3. *Diverse biological roles of the tetrathiomolybdate anion*, **Biplab K. Maiti,*** and J. J. G. Moura, *Coordination Chemistry Reviews*, **2021**, *429*, 213635. [IF: 15.367]
4. *Oxygen Reduction Assisted by the Concert of Redox Activity and Proton Relay in a Cu(II) Complex,* Srij**an Narayan Chowdhury, SachidulalBiswas,** P. Das, S. Paul and **Achintesh N. Biswas***, *Inorganic Chemistry*, 2020, *59*, 14012. [IF: 4.825]
5. *Redox-active ligand assisted electrocatalytic water oxidation by a mononuclear cobalt complex*, **SachidulalBiswas**, S. Bose, J. Debgupta, P. Das and **Achintesh N. Biswas***, *Dalton Transactions*, 2020, *49*, 7155. [IF: 4.174]
6. *A Diastereoselective Synthetic Approach towards the Synthesis of Berkeleylactone F and Its 4-epi-Derivative*, **SrijanaSubba, SumitSaha***, and S.Mandal, *SynOpen*, 2020, *4*, 66.
7. *Charge carrier transport and electrochemical stability of $Li_2O$ doped glassy ceramics*, A. Acharya, K. Bhattacharya, C. K. Ghosh, **Achintesh N. Biswas**, S. Bhattacharyay, *Materials Science and Engineering: B*,**2020**, *260*, 114612. [IF: 4.706]
8. *Synthesis, Characterization and Molecular Structure of Iron(III) Complex with Tridentate Diazene Ligand Having O,N,S Donor Set: Coexistence of Octahedral and Tetrahedral Iron(III) Sites in the Asymmetric Unit*, P. Das and **Achintesh N. Biswas**, *Journal of Chemical Crystallography*, 2020, *50*, 147. [IF: 0.589]
9. *Potential role of peptide-based antiviral therapy against SARS-CoV-2 infection*, Biplab K. Maiti*, *ACS Pharmacology & Translational Science*, 2020, *3*, 783.
10. *Can Papain-like Protease Inhibitors Halt SARS-CoV-2 Replication?*,**Biplab K. Maiti***, *ACS Pharmacology & Translational Science*, 2020, *3*, 1017.
11. *Heme/Hemeoxygenase-1 System Is a Potential Therapeutic Intervention for COVID-19 Patients with Severe Complications*, **Biplab K. Maiti***,*ACS Pharmacology & Translational Science*, 2020, *3*, 1032.
12. *Insight of boron induced single-step synthesis of short-chain olefins from bio-derived syngas*, I. K.Ghosh, Z.Iqbal, **Sumantra Bhattacharya**, and A.Bordoloi, *Fuel*, 2020, *263*, 116663. [IF: 5.578]
13. *Shape resonance of sulphur dioxide anion excited states using the CAP-CIP-FSMRCCSD method*, S.Basumallick, **Sumantra Bhattacharya**, I. Jana, N.Vaval, and S. Pal, *Molecular Physics*, 2020, *118*, 1. [IF: 1.767]
14. *Direct Oxidative Azo Coupling of Anilines Using a Self-Assembled Flower-like CuCo2O4 Material as a Catalyst under Aerobic Conditions*, A. R. Patel, G. Patel, G. Maity, S. P. Patel, **Sumantra Bhattacharya***,A. Putta, and S. Banerjee*, *ACS Omega*, 2020, *5*, 30416. [IF: 2.870]
15. *Single Step Synthesis of Reduced Graphene Oxide/ SnO2 Nanocomposites for Potential Optical and Semiconductor Applications*, A.Mallik, I. Roy, D. Chalapathi, C. Narayana, T.D. Das, A. Bhattacharya, S. Bera, **Sumantra Bhattacharya***, S. De, B. Das, D. Chattopadhya, *Materials Science and Engineering B*, 2021, *264*, 114938. [IF: 4.706]
16. *Performance improvement of p-type dye sensitized solar cells by blending of dissimilar dyes*, **Sumantra Bhattacharya***, and S. M. Pratik, *Computational and Theoretical Chemistry*, 2021, *1199*, 1322199. [IF: 1.607]
17. *1,4-Naphthoquinone accumulates reactive oxygen species in Staphylococcus aureus: a promising approach towards effective management of biofilm threat*, P. Paul, P. Chakraborty, A. Chatterjee, R. K. Sarker, D. GhoshDastidar, **TaraknathKundu**, N. Sarkar, Amlan Das, P. Tribedi, *Archives of Microbiology*, 2021, *203*, 1183. [IF: 1.884]
18. *Attenuation of Pseudomonas aeruginosa biofilm by thymoquinone: an individual and combinatorial study with tetrazine-capped silver nanoparticles and tryptophan*, P. Chakraborty, P. Paul, M. Kumari, S. Bhattacharjee, M. Singh, D. Maiti, D. GhoshDastidar, Y. Akhter, **TaraknathKundu**, Amlan Das, P. Tribedi, *Folia Microbiologica*, 2021, *66*(2), 255. [IF: 1.730]
19. *A compact inverted Y-shaped circularly polarized wideband monopole antenna with open loop*, R. Dhara and **TaraknathKundu**, *Engineering Reports*, 2020, *2*, e12326.
20. *Quantum Dot-FRET-based Detection of Vitamin B12 at Picomolar Level*, **SabyasachiPramanik***, S. Roy, S. Bhandari*, *Nanoscale Advances*, 2020, *2*(9), 3809.
21. *Luminescence Enhancement Based Sensing of L-Cysteine by Doped Quantum Dot*, **SabyasachiPramanik***, S. Roy, S. Bhandari*, *Chemistry-An Asian Journal*, 2020, *15*(13), 1948. [IF: 4.056]

**Book Chapters: Two (02)**

1. Study of Response Properties using Coupled Cluster method *by* Dr. Sumantra Bhattacharya, Lambert Academic Publishing, ISBN: 978-620-2-66737-1.
2. Advanced Physical Chemistry Experiments *by* Dr. Sumantra Bhattacharya, Dr. CharuArora, Bentham Science, Accepted for Publication

## Department of Humanities and Social Sciences

- Tripathi, Dhananjay and Bhaskar Chettri. "Humour and anticolonial discourse in the early novels of R.K. Narayan". *Agathos: An International Review of the Humanities and Social Sciences*, Volume 11, Issue 2 (21), 2020:151-160. (Web of Science - ESCI) (https://www.agathos-international-review.com/issue11_2/21.Tripathi.pdf)
- Sarmah, Ankita, Bedabrat Saika and Dhananjay Tripathi. "Can unemployment be answered by micro small and medium enterprises? Evidences from Assam." *Indian Growth and Development Review.* DOI: (https://www.emerald.com/insight/content/doi/10.1108/IGDR-09-2020-0140/full/html)
- Chettri, Bhaskar and Dhananjay Tripathi. "Multicultural Perspectives: Study of the Female Characters in the Select Raj Novels". *Cogito - Multidisciplinary Research Journal,* Vol. XIII, No. 1, 2021: 84-97. (Scopus) (http://cogito.ucdc.ro/cogito_nr_1_2021.pdf#page=84)
- Chettri, Bhaskar and Dhananjay Tripathi. "Envisioning Multiculturalism in Lakshmi Raj Sharma's The Tailor's Needle" *Literary Voice,* Vol.1, No.13, 2021:38-42. (Web of Science - ESCI) (http://www.literaryvoice.in/LV%20March%202021.pdf)
- Chinnadurai Kathiravan, Murugesan Selvam, Balasundram Maniam, Sankaran Venkateswar & Marxia Oli. Sigo (2021). Does Temperature Influence the Carbon Index? Evidences from India. *Journal of Public Affairs,* 21(1), 1-8. (ISSN: 1472-3891); (*Web of Science - ESCI)* https://onlinelibrary.wiley.com/doi/full/10.1002/pa.2117
- Sankarkumar Amirdhavasani, Murugesan Selvam, Marxia Oli Sigo, Amrutha Pavithran & Chinnadurai Kathiravan (2020). The Effects of Oil Price on Asia – Pacific Exchange Rates: Evidence from Quantile Regression Analysis, *International Journal of Advanced Science and Technology,* 29(8s), 1337-1347. (ISSN: 2005-4238)*; (Scopus);* http://sersc.org/journals/index.php/IJAST/article/view/12485/6470
- Kasilingam Lingaraja, Murugesan Selvam, Veluchamy Ramanujam, Sigo Marxia Oli & Chinadurai Kathiravan (2020). Stock Market Movements and Linkages between Emerging Markets in Asia and Developed Market Indices: Short Run and Long Run Analysis, Journal of Critical Reviews, 7(7), 616-629. (ISSN: 2394-5125); (Scopus); http://www.jcreview.com/fulltext/197-1589628811.pdf?1605150768

# Gandhi Jayanti

# Medical Facilities

The primary health care services are accessible in the medical unit of the Institute which is located within the campus, amidst the residential zone and the academic zone. The medical unit opens from 08 A.M. to 08 P.M. regularly, however it is functional round the clock in emergency. Three visiting medical consultants namely Dr. Dilli Deokota (Orthopedic Surgeon, Namchi District Hospital), Dr. Sanjay Rai (General Physician, Namchi District Hospital) and Dr. Pallavi Pariyar (General Physician, Ravangla PHC) are available in the medical unit in altered visiting hours throughout the week. A dedicated nursing team is also there to provide general medical services that include first aid, dressing, intravenous fluid infusion, blood pressure, pulse rate, SPO2, weight measurement and oxygen therapy. The students, employees, and other beneficiaries of the Institute can avail free outdoor medical treatment, medicines, first-aid, dressing, nebulization, and intravenous fluid infusion services in the medical unit.

One Ambulance with first aid kit and oxygen cylinder is available for students and employees of the Institute.

Medical Insurance facility is available to the students for IPD treatment.

The medical unit also helped all the beneficiaries to be updated with preventive measures of Covid-19 and proper COVID act. The general and preventive medicines of Covid-19 were also made available in the medical unit for the beneficiaries.

The medical unit is shifted to a new room with basic renovations. However, being located in a remote hill station, the overall medical facilities of the Institute need to be upgraded and enhanced to ensure smooth medical services to the beneficiaries.

*Medical treatment at Medical Unit*

*Ambulance Facility at NIT Sikkim*

*Medicine Store at Medical Unit*

# Academic Departments

# Department of Computer Science and Engineering

*computer would deserve to be called intelligent if it could deceive a human into believing that it was human.*

**Alan Turing**

The Department of Computer Science and Engineering (CSE) at National Institute of Technology Sikkim has been functioning since the inception of the Institute in the year 2010. The Department provides an outstanding teaching environment complemented by excellence in research.

The Department offers four years B. Tech degree, two years M. Tech degree and Ph. D in Computer Science and Engineering. The Department has a comprehensive curriculum on topics related to all aspects of Computer Science with special emphasis on applicability that is provided using latest techniques of engineering. The course structure is up-to-date and includes courses on state-of-the-art curriculum to equip the students and teachers with the latest developments in the field. The Department aspires to develop interdisciplinary and multidisciplinary projects based on the expertise of faculty members.

The major areas of on-going research in the Department include Artificial Intelligence, Machine Learning, Cryptography, Network Security, Parallel-Distributed and High-Performance Computing, Algorithms, Cloud Computing, Wireless and Sensor Networks, etc. The department and the Institute collectively focus on building research groups and leverage the research activities in Sikkim in particular, and North-East region in general using a coordinated effort of various other organizations working in the field of community development using science and technology. The Department has state-of-the-art infrastructure supported by high-speed Ethernet and Wireless Network.

The Faculty and Students often collaborate on projects, working side-by-side with Researchers from other Departments across the campus, colleges of North-East region in India and with institutes abroad. In addition to the available excellent environment and quality research opportunities in the Department, there is also a real sense of community and teamwork. The Department enjoys a rich culture of research through various projects under schemes such as Visvesvaraya Ph. D scheme, Research Grants from DeitY and DST, National Mission on Himalayan Studies, specific developmental projects for North-East region, etc. The Department also contributes towards community developments through Unnat Bharat Abhiyan and scientific lifestyle development of local community (as per the scheme of the Department of Atomic Energy).

The Department aims to become worthy in imparting high-quality knowledge and develop research attitude in Computer Science and Engineering domains as well as inter-disciplinary research with a purpose to serve humanity. These serviceable attitudes can be developed by imparting knowledge in cutting edge technologies keeping pace with prevalent industry standards, while at the same time instill societal responsibilities steeped in ethics for all professional activities.

## Programs / Courses offered by the Department

- B. Tech in Computer Science and Engineering
- M.Tech in Computer Science and Engineering
- Ph.D in Computer Science and Engineering

# Faculty Details

- **Prof. Mahesh Chandra Govil**
  Professor & Director
  Ph. D (IIT Roorkee), M. Tech (IIT Roorkee), B. Tech MNIT Jaipur (formerly MREC)
  **Area of Interest:** Real Time Systems, Parallel & Distributed Systems, Fault Tolerant Systems, Cloud Computing, Networks and Internet of Things.

- **Dr. Pratyay Kuila**
  Assistant Professor & HoD
  Ph. D (IIT (ISM) Dhanbad), M. Tech (NITTTR Kolkata), B. Tech (Govt. College of Engg. & Ceramic Tech., Kolkata)
  **Area of Interest:** Artificial Intelligence, Machine Learning, Soft Computing, Evolutionary Algorithms, Computational Complexity, Wireless Sensor Networks, Distributed Computing.

- **Dr. Sangram Ray**
  Assistant Professor
  Ph. D (IIT (ISM) Dhanbad), M. Tech (IIT (ISM) Dhanbad), B.Sc Maths. Hons. (BU), M.Sc M&C (IIT Dhanbad),
  **Area of Interest:** Cryptography and Information Security, Public Key Infrastructure, Elliptic Curve Cryptography, Content Centric Network, Internet of Things.

- **Dr. Tarun Biswas**
  Assistant Professor
  Ph. D (NIT Sikkim), M. Tech (NIT Durgapur), B. Tech (Govt. College of Engg. & Ceramic Tech., Kolkata)
  **Area of Interest:** Nature-Inspired Algorithms, Distributed Computing, Big Data, Edge Computing.

- **Dr. Banavath Balaji Naik**
  Assistant Professor
  Ph. D (NIT Sikkim), M. Tech (NIT Trichy), B. Tech (SRKREC, Andhra University)
  **Area of Interest:** Cloud Computing, Internet-of-Things, Computer Network.

- **Mr. Md. Sarfaraj Alam Ansari**
  Assistant Professor
  Ph.D. (pursuing from NIT Sikkim), M. Tech (NIT Durgapur), B.E (Magadh University)
  **Area of Interest:** Network Technology, Information Security & Risk Management.

- **Mr. Pankaj Kumar Keserwani**
  Assistant Professor
  Ph. D (pursuing from NIT Sikkim), MS (IIIT, Allahabad), B.Sc. (Ewing Christian College, Allahabad), MCA (UPTU, Lucknow)
  **Area of Interest:** Information Security, Machine Learning.

- **Ms. Gopa Bhaumik**
  Assistant Professor
  Ph. D (pursuing from NIT Sikkim), M. Tech (NIT Durgapur), B. Tech (NIT Agartala)
  **Area of Interest:** Image Processing, Computer Vision, Pattern Recognition, Deep Learning.

# Temporary Faculty Members

**Mr. Gajendra Singh Shekhawat**

**Mr. Uddalak Chatterjee**

**Ms. Anamika Sharma**

**Ms. Sayani Mondal**

# Staff

- **Mr. Tapan Chhetri**
  Technician
  MCA

## Laboratory Facilities

**1. Computer Networks Laboratory**

**No. of Computers:** 36

## Activities and Objectives

- To build an understanding of the fundamental concepts of Computer Networking.
- To describe the general principles of Data Communication, organization of Computer with the concept of Layered Approach (OSI model and TCP/IP).
- To implement a simple LAN with hubs, bridges and switches and describe how packets in the Internet are delivered.
- To introduce the students to advanced networking concepts, preparing the students for advanced courses in Computer Networking.
- To understand basic Computer Network Technology, different types of Network Topologies and Protocols.
- To assess how the choice of Data Structures and Algorithm Design Methods impacts the performance of programs.
- To choose the appropriate Data Structure and Algorithm Design Method for a specified application.
- To solve problems using Data Structures such as linear lists, stacks, queues, hash tables, binary trees, heaps, tournament trees, binary search trees, and graphs and writing programs for these solutions.

## Laboratory Courses Conducted

- Data Communication
- Computer Networks
- Adv. Computer Networks
- Internet of Things
- Wireless Sensor Networks
- Wireless Network Security
- Cyber Forensics
- Blockchain Technology

*Inside View of Computer Laboratory 1 (Computer Network Laboratory)*

**2. Data Science Laboratory**

**No. of Computers:** 36

## Activities and Objectives

- To apply Quantitative Modeling and Data Analysis Techniques to the solution of real-world business problems, communicate findings, and effectively present results using Data Visualization Techniques.
- To demonstrate knowledge of Statistical Data Analysis Techniques utilized in business decision making.
- To apply principles of Data Science to analyze the business problems.
- To develop a basic understanding of the building blocks of Artificial Intelligence as presented in terms of intelligent agents: search, knowledge representation, inference, logic, and learning.
- To apply Algorithms to build machine intelligence.

- To characterize Machine Learning Algorithms as supervised, semi-supervised, and unsupervised.
- To effectively use Machine Learning Toolboxes.

## Laboratory Courses Conducted

- Artificial Intelligence
- Machine Learning
- Deep Learning
- Big Data
- Natural Language Processing
- Data Analytics

*Inside View of Computer Laboratory 2 (Data Science Laboratory)*

**3. Computing Laboratory**

**No. of Computers:** 36

## Activities and Objectives

- To learn various Computer Programming Languages.
- To analyze the asymptotic performance of Algorithms.
- To understand mathematical formulation, complexity analysis and methodologies to solve recurrence relations for Algorithms.
- To apply important Algorithm Design Paradigms and methods of analysis.
- To design Algorithms using advance data structures.
- To understand Non-deterministic Polynomial (NP) class problems and formulate solutions using standard approaches.
- To provide students with contemporary knowledge in Parallel and Distributed Computing.
- To introduce a variety of methodologies and approaches for reasoning about concurrent and distributed programs.
- To understand database concepts, structures and query language.
- To understand the E-R model and Relational model.
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
- To understand Functional Dependency and Functional Decomposition.

## Laboratory Courses Conducted

- Programming in C, Python, JAVA
- Design and Analysis of Algorithms
- Adv. Algorithms
- Data Structure
- Image Processing
- Operating System
- DBMS

*Inside View of Computer Laboratory 3 (Computing Laboratory)*

**4. Simulations & Modeling Laboratory**

**No. of Computers:** 36

## Activities and Objectives

- To recognize the concepts and principles of Operating Systems.
- To provide comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in Operating Systems.
- To introduce Computer Graphics and Image Processing.
- 2D object visualization. Geometrical transformation of 2D objects.
- 3D objects visualization. Projections.

## Laboratory Courses Conducted

- Software Modeling and Design
- Soft Computing
- Evolutionary Computing
- Computer Graphics
- Image Processing
- Computer Vision

*Inside View of Computer Laboratory 4 (Simulations & Modeling Laboratory)*

### 5. Cloud Computing Laboratory

**No. of Computers:** 18

**SuMegha – the Cloud Server:** SuMegha is a scientific cloud providing cost effective and scalable High-Performance Computing (HPC) for individual researchers and organizations. It offers convenient access to reliable HPC clusters and storage, without the need to purchase and maintain sophisticated hardware. It provides virtual resources (servers, storage, network software and application) on demand for research to solve computation and data intensive problems.

## Activities and Objectives

- Creation of virtual clusters and virtual machines on demand.
- Facilitates Cloud Administration.
- Offers virtual infrastructure of various image sizes.
- SuMegha Portal provides secure access and management of cloud services for multiple users.
- IaaS-MPI Cluster, Hadoop Cluster OpenMp servers, virtual servers, virtual storage.

## Laboratory Courses Conducted

- Cloud Computing Laboratory
- Research and Development Activities

*Inside View of Cloud Computing Laboratory*

### 6. Advanced Computing Laboratory

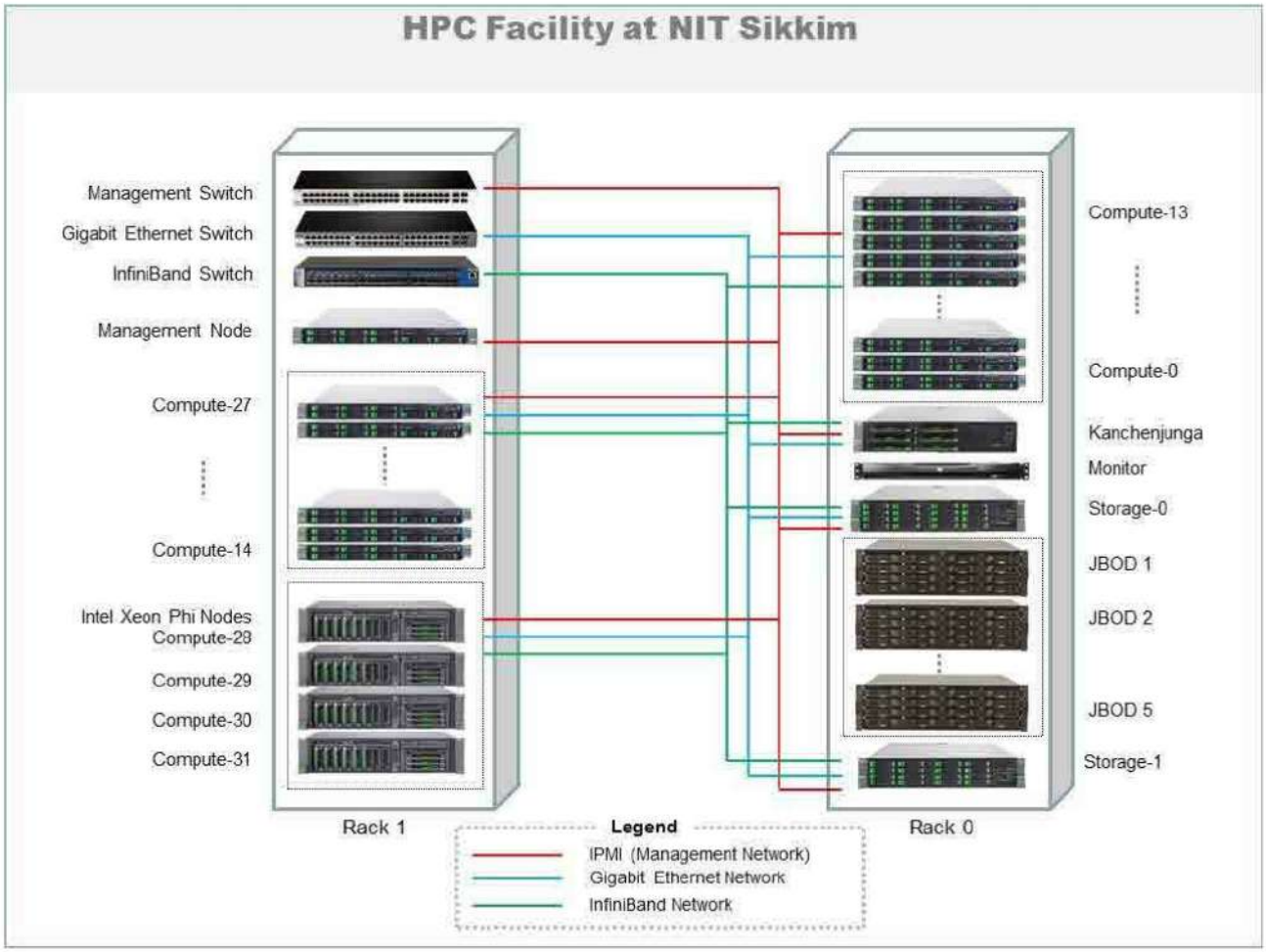
## Specifications

- 66 Number of Intel Xeon Ivy bridge (E5-2650V2) processor
- Peak Performance of 15.02 TFLOPS
- 528 x86_64 based processing cores
- 2.112 TB (2112 GB) of Total Memory (64 GB per Node)
- 6 X 600 GB, 15K RPM, SAS 6GBPS hot-plug HDD's in Master Node
- 2 X 250 GB, 7.2RPM, Enterprise SATA HDD's in Compute Nodes
- 4 X Intel Xeon Phi 5110P Accelerator (8 GB, 60 Co-processing Cores)
- 50 TB of NL-SAS and 20 TB of SAS storage configured as RAID6 Storage
- 36-port 56GBPS 4X FDR InfiniBand as Primary Network
- 48-port Gigabit Ethernet as a Secondary Network
- 48-port Gigabit Ethernet as a Management Network
- Visualization / Management Node

## Activities and Objectives

- To provide HPC PaaS with OpenMP, MPI and Map-Reduce parallel environments
- To select HPC application available as Golden images SuMegha Stack
- IaaS-MPI Cluster, Hadoop Cluster OpenMp servers, virtual servers, virtual storage.
- PaaS-Linux based MPI, Hadoop, OpenMP, GlusterFS, popular programming language and libraries
- SaaS-select applications (e.g. PSE for seasonal forecast model) and sample parallel programs

## HPC Architecture




## Laboratory Courses conducted

- Fog Computing
- Edge Computing
- Cloud Computing
- Quantum Computing
- Nature-Inspired Computing
- Parallel and Distributed Computing

**Project going on using HPC:** SMDP-C2SD Project at NIT Sikkim

## Researchers working on HPC

1. Mr. Hanuman Godara, Research Scholar, Department of Computer Science and Engineering
2. Mr. George Biswas, Research Scholar, Department of Physics
3. Mr. Keshab Das, Research Scholar, Department of Electronics and Communications Engineering
4. Ms. Nigidata Pradhan, Research Scholar, Department of Electronics and Communications Engineering
5. Ms. Priti Gupta, Project Faculty, Department of Electronics and Communications Engineering
6. Ms. Reshmi Dhara, Research Scholar, Department of Electronics and Communications Engineering

In addition to above Research Scholars one M. Tech student and two B. Tech students have successfully carried out their project works on HPC.

## External Organizations carrying out research work on HPC at NIT Sikkim

The following organizations are provided access to HPC at NIT Sikkim to carry out their research work:

1. INST Mohali
2. Sikkim University
3. Central University, Punjab
4. Ashutosh College, Kolkata

## List of running applications (Software Tools) on HPC System

1. Onama (Parallel Application Suite)
2. CHReME (for HPC Resource Management)
3. ROMS (Regional Ocean Modeling System)
4. Gaussian9 and Gauss View5
5. OpenFOAM (Open source Field Operation and Manipulation)
6. VASP & WANNIER90
7. Cadence
8. Mentor
9. MATLAB
10. Ansys19R (EM & CFD)
11. Anaconda & Python
12. Intel Parallel Studio (Intel MPI, Fortran, OpenMP compiler)
13. Ganglia (Cluster Monitoring)

*PARAM KANCHENJUNGA*

### GPU Facility

No. of Workstations: 02 with 4 GPUs.

### Specifications

**Processor:** Intel Xeon 5122 3.6Ghz, 4C, 16.5MB Cache, 105W

**Memory:** 64GB (2 X 32GB) DDR4 2666 DIMM ECC REGRAM expandable up to 768GB

**Hard Disk:** 512GB 2.5in SATA SSD, 2TB 7200 SATA Hard Disk

**Graphics:** 2*Nvidia 2080TI 11GB

**OS:** Windows 10 Pro Workstations Plus India

## Ongoing Projects / Schemes in the Department

**Development of Efficient and Secure Content Centric Network (CCN) Architecture with Communication Protocols using Elliptic Curve Cryptography (ECC),** *funded by* ICPS Division, DST, Ministry of Science and Technology, Govt. of India **(*Rs.* 20 lacs).**

**Visvesvaraya Ph. D Scheme in Electronics and IT** *funded by* DeitY, Ministry of Electronics and IT, Govt. of India **(*Rs.* 30 lacs).**

**Design of Efficient and Secure Key Management Scheme for Internet-of-Things (IoT) using Elliptic Curve Cryptography (ECC),** *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India **(*Rs.* 2 *lacs*).**

**Design and development of scheme(s) for handling flash crowd in live video streaming in Peer-to-Peer network,** *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India **(*Rs.* 2 *lacs*).**

**Design of an approach for monitoring of water quality in large reservoir using underwater sensor network,** *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India **(*Rs.* 2 *lacs*).**

**Development of Particle Swarm Optimization Based Scheme for Improving Coverage and Connectivity in Mobile Wireless Sensor Networks,** *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India **(*Rs.* 2 *lacs*).**

**Design of Efficient and Secure Internet of Things (IoT) Communication Framework in context of Content Centric Network (CCN) using Elliptic Curve Cryptography (ECC) – A**

**next generation smart communication technology, funded** *by* Ministry of Electronics & Information Technology, Govt. of India **(*Rs. 68 lacs*).**

## Collaboration with other Departments / Institutes

- University of Bremen, Germany
- Indian Institute of Technology, Kharagpur
- Indian Institute of Technology, Guwahati
- CDAC, Pune
- Malviya National Institute of Technology, Jaipur
- Dr. B. R. Ambedkar National Institute of Technology, Jalandhar

## Departmental Committees

| Sl. No. | Committee name | Members |
|---|---|---|
| 1. | Academic Performance Evaluation Committee (APEC) | (i) Dr. Pratyay Kuila, Convener & HoD, Convener DUGC<br>(ii) Faculty Advisor of the concerned student(s), Member<br>(iii) Dr. Sangram Ray, HoD Nominee<br>(iv) Dr. Molay Roy, Nominated by the Dean Academic |
| 2. | Departmental Undergraduate Committee (DUGC) | (i) Dr. Pratyay Kuila, Convener & HoD<br>(ii) Dr. Sangram Ray, Convener DPGC<br>(iii) Ms. Gopa Bhaumik, Member<br>(iv) Dr. B Balaji Naik, Member |
| 3. | Departmental Postgraduate Committee (DPGC) | (i) Dr. Sangram Ray, Convener DPGC<br>(ii) Dr. Pratyay Kuila, HoD & Convener DUGC<br>(iii) Dr. Tarun Biswas, Member<br>(iv) Ms. Gopa Bhaumik, Member<br>(v) Dr. Sanjay Kumar Jana, Nominated by the Chairperson Senate |
| 4. | Departmental Examination and Result Committee | (i) Dr. Tarun Biswas, Convener<br>(ii) Mr. Uddalok Chatterjee |
| 5. | Departmental Time Table Committee | (i) Dr. Tarun Biswas, Convener<br>(ii) Mr. Uddalok Chatterjee |
| 6. | Departmental Purchase Committee | (i) Dr. Pratyay Kuila, Convener<br>(ii) Md. Alam Ansari, Member<br>(iii) Mr. Gajendra Singh Shekhawat, Member<br>(iv) Indenter |
| 7. | Departmental Library Committee | (i) Ms. Gopa Bhaumik<br>(ii) Ms. Anamika Sharma<br>(iii) Ms. Sayani Mondal |
| 8. | Departmental Networking and Internet Committee | (i) Dr. Pratyay Kuila, Convener<br>(ii) Mr. Pankaj Kumar Keserwani |
| 9. | Departmental Website Development Committee | (i) Dr. B. Balaji Naik, Convener<br>(ii) Mr. Alam Ansari |
| 10. | Coordinator, Training and Placement | Md. Alam Ansari |
| 11. | Coordinator, Community Developments | Mr. Pankaj Kumar Keserwani |
| 12. | Coordinator, Reports Preparation, etc. | Ms. Gopa Bhaumik |
| 13. | Laboratory In-charge, HPC | Dr. Tarun Biswas |
| 14. | Laboratory In-charge, CL-1, CL-2 | Mr. Pankaj Kumar Keserwani |
| 15. | Laboratory In-charge, CL-3 | Ms. Gopa Bhaumik |
| 16. | Laboratory In-charge, Cloud Computing Lab. and CL-4 | Dr. B. Balaji Naik |
| 17. | Faculty Advisor, 1st year, B.Tech (CSE) | Mr. Pankaj Kumar Keserwani |
| 18. | Faculty Advisor, 2nd year, B.Tech (CSE) | Ms. Gopa Bhaumik |
| 19. | Faculty Advisor, 3rd year, B. Tech (CSE) | Dr. B. Balaji Naik |
| 20. | Faculty Advisor, 4th year, B.Tech (CSE) | Dr. Tarun Biswas |
| 21. | Faculty Advisor, M. Tech(CSE) | Dr. Pratyay Kuila |

## Workshop Organized

- AICTE-ATAL sponsored Faculty Development Program on ***"Cyber Security"*** during December 01-05, 2020.
- TEQIP-III sponsored online workshop on ***"Fuzzy Logic Systems in Engineering Applications (FLSEA 21)"*** during March 15 - 19, 2021.
- AICTE sponsored one-week Faculty Development Program on ***"Cloud Computing: Challenges and Research Issues"*** during March 22 - 27, 2021.

## Keynote Speaker / Expert Lectures

- **Prof. Mahesh Chandra Govil, Director, NIT Sikkim** has delivered an expert lecture on ***"Online Advertisement Fraud Detection"*** on 04.12.2020.
- **Prof. Mahesh Chandra Govil, Director, NIT Sikkim** has delivered an expert lecture on ***"Real Time Issues for Cloud"*** on 26.03.2021.
- **Dr. Sangram Ray, NIT Sikkim** has delivered an expert lecture on ***"Introduction to Cyber Security: Challenges and Solutions"*** on 01.12.2020.
- **Dr. Arunava Roy, Monash University, Malaysia** has delivered an expert lecture on ***"Evading Active Authentication using Adversarial Machine Learning Approaches"*** on 01.12.2020.
- **Prof. Rama Krishna Challa, NITTTR Chandigarh** has delivered an expert lecture on ***"Symmetric Key Cryptography: Challenges and Solutions"*** on 02.12.2020.
- **Dr. E.S Pilli, MNIT Jaipur** has delivered an expert lecture on ***"Blockchain Technology"*** on 19.11.2020.
- **Dr. E.S Pilli, MNIT Jaipur** has delivered an expert lecture on ***"Cloud Security"*** on 02.12.2020.
- **Dr. Arijit Karati, National Sun Yat-sen University, Taiwan** has delivered an expert lecture on ***"Edge Security: Challenges and Possible Cryptographic Solutions"*** on 02.12.2020.
- **Dr. C. B. Sharma, IPS (Retd.)** has delivered an expert lecture on ***"Legal Mandate and International Standards"*** on 03.12.2020.
- **Prof. Santosh Biswas, IIT Bhilai** has delivered an expert lecture on ***"Event Based Intrusion Detection System for Cyber Security"*** on 03.12.2020.
- **Dr. Govind Prasad Gupta, NIT Raipur** has delivered an expert lecture on ***"Intrusion Detection System"*** on 03.12.2020.
- **Prof. Gosta Pada Biswas, ISM Dhanbad** has delivered an expert lecture on ***"Public Key Cryptography: RSA to Lattice Schemes"*** on 04.12.2020.
- **Dr. Mani Madhukar, IBM India Pvt. Ltd.** has delivered an expert lecture on ***"Blockchain Technology"*** on 04.12.2020.
- **Dr. Mou Dasgupta, NIT Raipur** has delivered an expert lecture on ***"Attribute Based Encryption and Its Application in Healthcare Sector"*** on 05.12.2020.
- **Ms. Paulomi Mukherjee, Art of Living** has delivered an expert lecture on ***"Stress Management"*** on 05.12.2020.
- **Prof. Dhananjay Singh, Hankuk University of Foreign Studies (HUFS), South Korea** has delivered an expert lecture on ***"Future Internet Model and Services"*** on 08.02.2021.
- **Prof. Dhananjay Singh, Hankuk University of Foreign Studies (HUFS), South Korea** has delivered an expert lecture on ***"Internet of Things for Smart Community Solutions"*** on 09.02.2021.
- **Prof. Rajkumar Buyya, Cloud Computing and Distributed Systems (CLOUDS) Laboratory, University of Melbourne, Australia** has delivered an expert lecture on ***"Neoteric Frontiers in Cloud and Edge Computing"*** on 22.03.2021.
- **Prof. Dhananjay Singh, Hankuk University of Foreign Studies (HUFS), South Korea** has delivered expert lectures on ***"Recent Advances in Cloud Computing Architecture, Challenges and Services"*** and ***"AI based vehicular cloud computing architecture: vehicle data analysis and services."*** on 22.03.2021.
- **Dr. E.S Pilli, MNIT Jaipur** has delivered expert lectures on ***"Containerization and Docker in Cloud Computing"*** and ***"Security aspects in Cloud"*** on 22.03.2021 and 24.03.2021.
- **Prof. Awadhesh Kumar Singh, NIT Kurukshetra** has delivered expert lectures on ***"Virtualization in Cloud"*** and ***"Stream Processing in Cloud"*** on 24.03.2021 and 26.03.2021.
- **Dr. Pratyay Kuila, HoD (CSE), NIT Sikkim** has delivered an expert lecture on ***"Approximation Algorithms for Cloud"*** on 25.03.2021.
- **Prof. K. Chandrasekaran, NIT Surathkal** has delivered an expert lecture on ***"Data Management in Cloud Computing"*** on 25.03.2021.
- **Prof. Mansoor Alam, Northern Illinois University, Chicago** has delivered an expert lecture on ***"Mobile Edge Offloading Using Markov Decision Processes"*** on 27.03.2021.

## Involvement in Community Development

- Lectures by Senior Faculty members in nearby schools.
- Computer exposure to the children from nearby villages and schools.
- Department / Laboratory visit by the nearby school students.

## List of the Institutes / Organizations where the students have undergone Internships

▪ WinStaPro (WSP) - California ▪ MNIT Jaipur ▪ CDAC - Silchar ▪ Intel Corporation - Bengaluru ▪ SRFP - IIT Guwahati ▪ IIT Bhilai ▪ NE Taxi - Gangtok ▪ Simple Guest Coliving ▪ Sinope Integrated ▪ Sinope Integrated ▪ Salazar E-Commerce ▪ Think2Exam ▪ Foxiser ▪ Vizag Steel Plant (Database Center) ▪ PaSay

## Students Achievements

The students from the department of CSE got placement offers in various esteemed organizations. The organizations include Clear tax, Marvel Semi-Conductor, McAfee, Capgemini, Samsung, Cimpress, Zensar, Byju's, Virtusa, LTI, IBM, BitMapper, Invenio, Value Labs.

## B.Tech Projects

| SL. No. | Name of the Student | Title of Thesis | Supervisor |
|---|---|---|---|
| 1 | Palzang Norgay Bhutia | Novel Approach for key Management and Authentication in Generic IoT Architecture using Elliptic Curve Cryptography. | Mr. Uddalak Chatterjee |
| 2 | Manish Kumar | A Cancer Recovery Monitoring Tool based on Yoga Input. | Mr. Pankaj Kumar Keserwani |
| 3 | Supriyo Banerjee | Information Fusion in Wireless Sensor Network for Resource Optimization. | Ms. Anamika Sharma |
| 4 | Rupesh Kumar Chaudhary | Information Fusion in Wireless Sensor Network for Resource Optimization. | Ms. Anamika Sharma |
| 5 | Aman Bansal | Improvement of User Experience on Cleartax India Online Platform. | Dr. Sangram Ray |
| 6 | Abisek Dahal | Routing Scheme for Underwater Wireless Sensor Network. | Mr. Gajendra Singh Shekhawat |
| 7 | Deepak Prasad | Screening and analysis of specific language impairment in young children by analyzing the textures of speech signal. | Dr. Pratyay Kuila |
| 8 | Meraj Ahmad | A Novel Method for Community Detection in Airport Network. | Mr. Samya Muhuri |
| 9 | Ravi Kumar | Classification of Internet Traffic and Identification of P2P Application by Analyzing its Behavior. | Md. Sarfaraj Alam Ansari |
| 10 | Anurag Dwivedi | A Comparative Analysis and Implementation of a Novel approach for Intrusion Detection in Wireless Networks. | Pankaj Kumar Keserwani |
| 11 | Rishabh Mishra | Selfish Peer Detection and Mitigation Measures. | Md. Sarfaraj Alam Ansari |
| 12 | Sandeep Jadon | Community Detection using Game Theory. | Mr. Samya Muhuri |
| 13 | Rabindra Kumar | Design of Desktop Voice Assistant System. | Mr. Uddalak Chatterjee |
| 14 | Divyanshi Verma | Forwarding Strategy in SDN Based Content Centric Network. | Dr. Sangram Ray |
| 15 | Sunil Poddar | Underwater Wireless Sensor Network. | Mr. Gajendra Singh Shekhawat |
| 16 | Amit Kumar Jatav | A Literature Survey with Comprehensive Study of Intrusion Detection System. | Mr. Pankaj Kumar Keserwani |
| 17 | Shyam Kumar | A Literature Survey with Comprehensive Study of Intrusion Detection System. | Mr. Pankaj Kumar Keserwani |
| 18 | Priyanka Kumari | Multicasting and Broadcasting on One Simulator. | Dr. Suman Bhattacharjee |
| 19 | Reshab Gupta | A Literature Survey with Comprehensive Study of Intrusion Detection System. | Mr. Pankaj Kumar Keserwani |
| 20 | Abhinandan Lamsal Sharma | Patient DNA Data Encryption Using Inspired Symmetric Key Cryptographic Techniques to Secure Cloud Computing. | B. Balaji Naik |
| 21 | Anshu Priya Jain | McAfee Ecommerce Payment Enhancements and System Anomaly Detection. | Dr. Suman Bhattacharjee |
| 22 | Rahul Meena | Development of Texture Feature Descriptor for Face Recognition. | Ms. Gopa Bhaumik |
| 23 | Kumar Akshay Gupta | An improved Genetic Algorithm for Feature Selection. | Mr. Pankaj Kumar Keserwani |
| 24 | D.J.V. Pavan Kumar | Optimizing Energy Consumption with Task Co- Ordination in Clouds. | Md. Sarfaraj Alam Ansari |

| SL. No. | Name of the Student | Title of Thesis | Supervisor |
|---|---|---|---|
| 25 | Prashant Agarwal | Windows Device Driver Validation. | Mr. Gajendra Shekhawat |
| 26 | Sancha Bir Gurung | Novel Approach for key Management and Authentication in Generic IoT Architecture using Elliptic Curve Cryptography. | Mr. Uddalak Chatterjee |
| 27 | Aman Yadav | Tool for Finding the Semantic Difference Between Tweets and Reviews. | Dr. Pratyay Kuila |
| 28 | Joydeep Halder | Development of Crop Pest Prediction Model using Deep Learning. | Mr. Tarun Biswas |
| 29 | Kinthali Sai Lakshman | A Yolo Based Model for Image- Text Detection. | Mr. Tarun Biswas |
| 30 | Govardhan Misra | Flash Cloud Management in P2P network | Md. Sarfaraj Alam Ansari |
| 31 | Nishu Bharti | Enhancement of Blast Radius for Terraform | Mr B Balaji Naik |
| 32 | Ashwani Kumar Dwivedi | Design a Heuristic Approach for Workflow Scheduling in Cloud Computing Environment. | Mr B Balaji Naik |
| 33 | Mithun Singh | Window Server vNext 2k19 Inbox Driver Validation. | Ms Gopa Bhaumik |
| 34 | Sandeep Kumar Sah | Design of DRM System in Media Streaming | Ms Anamika Sharma |
| 35 | Ravi Prakash Mishra | Design of DRM System in Media Streaming | Ms Anamika Sharma |

## M.Tech Degree

| SL No. | Name of the student | Title of Thesis | Supervisor |
|---|---|---|---|
| 1 | Rajesh Chilukamari | An ECC based lightweight anonymity preserving authentication scheme for smart-grid environment. | Dr. Sangram Ray |
| 2 | Rahul Tripathi | One class classification and medical image data augmentation using generative adversarial network. | Dr. Pratyay Kuila |
| 3 | Nabendu Bhui | Feature Selection from Healthcare Data Based on Deep Learning Approach and Evolutionary Algorithm | Dr. Pratyay Kuila |
| 4 | Abhishek Kumar | Computational Analysis of Optimizers for a Convolutional Neural Network on Intel Hardware. | Ms Gopa Bhaumik |
| 5 | Siddharth Pandey | Deep Learning based Daily Stock Price Prediction Using Bidirectional Long Short-term Memory and Transfer Learning | Dr. Tarun Biswas |
| 6 | Rahul Kumar | A Lightweight and Provable Secure Mutual Authentication and Key Agreement Protocol for Smart Healthcare in Smart City Environment | Dr. Sangram Ray |

## Research Scholars

| SL No. | Name of Scholar | Supervisor | Research Area |
|---|---|---|---|
| 1 | Mr. Hanuman Godara | Prof. M. C. Govil<br>Dr. E.S Pilli, MNIT Jaipur | High Performance Data Analytics |
| 2 | Mr. Rahul DeoVerma | Dr. Shefalika G. Samaddar | Routing Protocols |
| 3 | Ms. Sharmistha Adhikari | Dr. Sangram Ray | Content Centric Network |
| 4 | Mr. Vivek Kumar | Dr. Sangram Ray | Identity Based Cryptography |
| 5 | Mr. Subhash Harizan | Dr. Pratyay Kuila | Wireless Sensor Network, Evolutionary Algorithms |
| 6 | Mr. Pintu Kumar Ram | Dr. Pratyay Kuila | Machine Learning, Healthcare data |
| 7 | Ms. Dipanwita Sadhukhan | Dr. Sangram Ray | Information Security |
| 8 | Mr. Deo Dutta Ishwar | Prof. Arun B. Samaddar | Multimedia Optimization |
| 9 | Mr. Suman Majumder | Dr. Sangram Ray | IoT Security |
| 10 | Mr. Santanu Kumar Misra | Dr. Pratyay Kuila | Quantum Inspired Algorithms |
| 11 | Mr. Dhananjay Kumar | Dr. Sangram Ray | Content Centric Network |

## Ph.D. Degree Awarded

| Name of the Scholar | Title of Thesis | Supervisor | Awarded |
|---|---|---|---|
| Banavath Balaji Naik | Swarm Inspired Meta-Heuristic Algorithms for Multi-Criteria Workflow Scheduling in Cloud Environment | Prof. Arun Baran Samaddar<br>Dr. Dhananjay Singh<br>Dr. Pratyay Kuila | Awarded |
| Tarun Biswas | Multi-Criteria Workflow Scheduling Based on Nature-Inspired Algorithms for Heterogeneous Computing Systems | Dr. Pratyay Kuila, Dr. Anjan K. Ray, Dept. of EEE, NIT Sikkim | Awarded |

# Department of Electronics and Communication Engineering

*It is the supreme art of the teacher to awaken joy in creative expression and knowledge.*

**Albert Einstein**

## Introduction

The Department aims to provide its students the essential technical knowledge and skills of contemporary and futuristic technologies in the field of Electronics and Communication Engineering to match the global requirements.The Department offers B. Tech programme in Electronics and Communication Engineering, M. Tech programme in Microelectronics and VLSI Design, and Ph.D. Degree. Proper weightage of theory and practical learning are given in the curriculum to all the offered programmes. The perspective of all the stakeholders i.e. renounced academician, students, their parents, industrial partners and the agencies involved in quality education are considered in the curriculum.

The research focus of the Department is in the areas of VLSI Design, Application Specific Integrated Circuits (ASIC) Design & Modeling, Optimization of High-Performance Semiconductor Devices, Microwave Engineering & Antenna Design, Wireless Communication, Satellite Systems & Navigation, Signal Processing, and Solar Cell.

The Department has basic laboratory facilities to provide hands-on experience with the latest technologies. The Department comprises a diverse group of young, enthusiastic and dynamic Faculty members. Continuous evaluation of teaching and learning are carried out in the Department by collecting necessary feedback from the students. Special care and attention are taken for holistic development of the students to help them in academics, research and career aspects. Moreover, internship, industrial projects and interaction with leading academicians & industry professionals are also arranged for the students to help them gain leadership skills, competitive skills, and entrepreneurial skills. Students are also encouraged to take part in various Departmental and Institute level Committees to actively participate in the organization of Placement Drives, Workshops, Technical Festival, Cultural Festival and Sports Events. Anuvrat, the Departmental Technical Club organizes many technical events such as Alumni Talk Series namely Vimrishyotsava, National Science Day Lecture, Quiz Competition etc. on regular basis.

### Aspiration

To contribute in finding solutions to the challenges faced by the nation and the world by furnishing new thoughts and talents.

### Mission

- To generate new knowledge by engaging in cutting-edge research and to promote academic growth by offering state-of-the-art undergraduate, postgraduate and doctoral programs.
- To nurture the national and international competitiveness in the students by facilitating international internships, industrial project opportunities and research on futuristic technologies.

### Vision

- Achieving excellence in teaching and research in the field of Electronics and Communication Engineering through balance in theory and practice, and thereby contributing to our society and be a source of pride for all Indians.

## Salient Features

Various measures are taken to impart and adapt attributes like critical thinking, innovation, global competitiveness, introduction to new technology, industry trends etc. Some of them are:

- Technical support to carry out research, projects and patent related work.
- Guidance for excelling in Placement and Competitive examinations.
- Exposure to latest technologies and research areas through Seminars, Workshops and Summer Trainings.
- Online Learning through various platforms such as NPTEL, SWAYAM etc.

# Faculty Details

- **Dr. Sanjay Kumar Jana**
  Assistant Professor and HOD
  Ph.D (IIT Kharagpur), M.Tech (Jadavpur University), M. Sc. (Vidyasagar University)
  **Area of Interest:** High Speed Semiconductor Devices, Analog IC Design.

- **Dr. Surajit Kundu**
  Assistant Professor
  Ph.D (NIT Sikkim), M.Tech (IIT Kharagpur), B.Tech. (WBUT)
  **Area of Interest:** Digital Communication, Wireless Communication, RF, Microwave and Antenna Engineering, Metasurfaces, Periodic Reflective Surfaces (FSS, AMC), Global Navigation Satellite Communication, Ground Penetrating Radar

- **Dr. Hemant Kumar Kathania**
  Assistant Professor
  Ph.D (NIT Sikkim), M.Tech (IIT Guwahati), B.Tech. (University of Rajasthan)
  **Area of Interest:** Signal and Speech Processing.

- **Dr. Reshmi Dhara**
  Assistant Professor
  Ph.D (pursuing from NIT Sikkim), M.Tech. (IIT Kharagpur), B.Tech. (WBUT)
  **Area of Interest:** Polarized Microstrip Antenna.

# Temporary Faculty Members

**Dr. Sukanta Dhar**

**Dr. Ayan Chatterjee**

**Dr. Avinash Kumar**

**Dr. Jeetendra Singh**

**Dr. Sudipta Das**

**Dr. Rahul Pal**

**Dr. Indrajit Das**

**Ms. Priti Gupta**

# Support Staff

**Mr. Amit Tamang**
Technical Assistant

**Mr. Siddarth Pradhan**
Technician

## Departmental Committees

| Sl. No. | Committee name | Members |
|---|---|---|
| 1 | Academic Performance Evaluation Committee (APEC) | (i) Dr. Sanjay Kumar Jana, HoD and Convener<br>(ii) Dr. Surajit Kundu, Convener DUGC, Member<br>(iii) Faculty Advisor of the concerned student(s) Member<br>(iv) Dr. Jeetendra Singh, HoD Nominee<br>(v) Mr. Tarun Biswas, Department of CSE |

| Sl. No. | Committee name | Members |
|---|---|---|
| 2 | Departmental Undergraduate Committee (DUGC) | (i) Dr. Surajit Kundu, Convener DUGC<br>(ii) Dr. Sanjay Kumar Jana, HoD<br>(iii) Ms. Reshmi Dhara, Member<br>(iv) Dr. Sukanta Dhar, Member<br>(v) Dr. Ayan Chatterjee, Member |
| 3 | Departmental Postgraduate Committee (DPGC) | (i) Dr. Sanjay Kumar Jana, HoD, ECE, Convener DPGC<br>(ii) Dr. Surajit Kundu, Convener DUGC<br>(iii) Dr. Sukanta Dhar, Member<br>(iv) Dr. Sudipta Das, Member<br>(v) Dr. Ayan Chatterjee, Member<br>(vi) Dr. Avinash Kumar, Member<br>(vii) Dr. Shashank Dwivedi, Member<br>(viii)Dr. Shambhunath Barman, Department of Mechanical Engineering |

## Membership of Technical Association / Society

Faculty members of the Department of ECE are allied with various Technical Associations / Societies like IEEE, URSI, IEEE Antennas and Propagation Society (AP-S), ISPRS, Internet Society, Kolkata Chapter, IAENG, SDIWC, FOSET, IEEE Signal Processing Society, International Speech Communication Association (ISCA), International Speech Communication Association (ISCA), Institution of Engineers (India) etc.

## Laboratory Facilities

The Department has basic laboratory facilities and each of them are equipped with some of the modern technical instruments which are useful for the UG and PG students.

- **Analog Circuits Laboratory**

  Analog Circuit Design Laboratory course exposes the students to the world of analog from system design perspective and enables the students to understand and address the challenges as a System Designer.The goal of the course is to develop the students' ability to state-of-the-art design and conduct experiments, analyze and interpret data, ability to design a system which meets the desired specifications, ability to identify, formulate, and solve engineering problems, ability to use the techniques, skills and modern engineering tools necessary for Engineering practices.

  Each laboratory experiment has a design part, simulation and an actual experimental verification in the laboratory (bread-boarding / soldering). The basic objective is to give hands-on experience in design and implementation of analog and mixed-signal circuits.

*Analog Circuit Laboratory*

- **Digital Electronics Laboratory**

  The experiments corresponding to the Digital Electronics Laboratory are Combinational Logic design using basic gates (Code Converters, Comparators), Combinational Logic design using decoders and MUXs, Arithmetic circuits - Half and Full Adders and Subtractors, Flip flop circuit (RS latch, JK & master slave) using basic gates, Counters, Transfer Characteristics, Measurement of Sinking and Sourcing currents of TTL gates etc. Digital Electronics Laboratory is well equipped with Digital Logic Trainer kits where various experiments can be performed. Through the experiments being performed at this laboratory, the students would be able to design the simple logic circuits and test / verify the functionality of the logic circuits. The students will gain a thorough understanding of the fundamental concepts and techniques used in digital electronics that will make them analyze and design various combinational and sequential circuits.

*Digital Electronics Laboratory*

- **Microprocessor and Microcontroller Laboratory**

  The corresponding Laboratory is equipped with various microprocessor / microcontroller training systems that can be utilized for performing relevant experiments such as Assembly Language and Timer Programming using status check and interrupts, LCD interfacing to 8051, Motor Speed control using microcontroller, studying current microcontroller e.g. ATmega, Arduino etc. This Laboratory enable the students to develop the Assembly Level Programming using instruction set, analyze how different I/O devices can be interfaced to processor and will explore several techniques of interfacing, design projects for practical applications like home automation system, Digital Clock etc.

*Microprocessor and Microcontroller Laboratory*

- **Communication Engineering Laboratory**

  The experiments corresponding to the Analog Communication and Digital Communication techniques are performed in this Laboratory. The experiments are primarily performed in simulation using MATLAB tool for initial understanding and visualization. Afterwards the hands-on experiments are performed using hardware such as discrete components, ICs, breadboards and hardware equipment like signal generator, DC power supply, Oscilloscopes, Spectrum Analyzer etc. Trainer Kits are also available for the students mainly for performing some comparatively complex experiments and to study the output waveforms for various inputs in different channel conditions.

  Some experiments performed in Analog Communication Laboratory are generation and detection of different continuous wave modulation techniques: amplitude modulation (e.g., DSB-FC, DSB-SC, SSB), frequency modulation (FM) and phase modulation (PM); pulse modulation techniques: pulse amplitude modulation (PAM), pulse width modulation (PWM) and pulse positioning modulation (PPM); Frequency Division Multiplexing and Demultiplexing schemes etc. Experiments to study digital communication systems are carried out in this laboratory such as generation and detection of different pulse code modulation techniques (e.g., PCM, DPCM, and DM). Besides, different line coding methods used to transmit digital data over a transmission line are experimentally studied such as unipolar, polar and bipolar coding. Further, to study inter-symbol interference (ISI) over a noisy channel, EYE pattern is generated and analyzed in the oscilloscope. On the other hand, to transmit data over a channel, different digital modulation schemes, i.e., amplitude shift keying (ASK), frequency-shift keying (FSK), phase-shift keying (PSK), are experimentally studied. Multiplexing and multiple access techniques like TDM, and CDMA are also performed. Familiarization with the conventional and advanced wireless communication systems are pursued in this laboratory. Some advanced wireless communication engineering set up such as 2x2 MIMO (NI USRP), Satellite uplink and downlink data transmission, Ad-hoc Wireless Communication (Bluetooth, Wi-Fi and Zigbee) Kit, Global Position System (GPS) kit, Global System for Mobile communication (GSM) kit are also available in this laboratory. Model to determine the free space loss, the power received and BER-SNR graphs for different types of channels (e.g., AWGN and fading channel) with different types of digital modulation techniques (e.g., ASK, FSK, BPSK, QPSK) are performed using programming. Apart from that some of the advance wireless technologies, spread spectrum modulation and demodulation techniques (DSSS and FHSS), and orthogonal frequency division multiplexing (OFDM) modulation and de-modulation are also studied and performed using programming in this laboratory. These help the students to cope up with the modern wireless communication technologies and standards used in various applications. With such a variety of experimental learning opportunity, students can develop the knowledge of design and analysis of various components of modern communication systems.

*Communication Engineering Laboratory*

- **Electromagnetics and Antenna Laboratory**

  The Electromagnetics and Antenna Laboratory familiarize the students with the fundamental principles and applications of electromagnetic wave propagation which is essential in the field of wireless communication. The corresponding laboratory aims to develop the students' ability to implement their knowledge achieved from electromagnetic field theory and antennas in practical domain. This laboratory develops the hands-on skill of the students about the electromagnetic phenomenon such as propagation of fields in various guided mediums and charaterization of radiation of fields from various antennas. With the use of transmission line systems as well as coaxial cables, students can study and characterize the standing waves and its effect on signal propagation. In this laboratory the students can observe the radiation

patterns of various planar and non-planar antennas followed by evaluation of the antenna parameters that lead them to acquire the ability to distinguish between different types of antennas with respect to the field of applications.

*Electromagnetics and Antenna Laboratory*

- **Microwave Engineering Laboratory**

  Microwave Engineering Laboratory is suitable for performing experiments such as studying the characteristics of various microwave passive components including Directional Coupler, Branchline Coupler, Rat Race Coupler, attenuator, ring resonator, power divider etc. in the microwave frequencies up to 3 GHz. Besides, frequency response of microwave oscillator such as GUNN diode and Reflex Klystron is observed in the waveguide test bench. Design and simulation of various planar and non-planar antennas operating in the microwave frequencies (microstrip patch antenna, slot antenna) are carried out in this laboratory followed by analysis of the antenna parameters (VSWR, radiation pattern, gain) using High frequency simulators. Measurement of radiation, scattering parameters, impedance of microwave antennas is also performed using network analyzer that makes the students aware of the characteristics of the antennas used in various high frequency applications.

*Microwave Engineering Laboratory*

- **VLSI Design Laboratory**

  The VLSI Design Laboratory is equipped with state-of-the-art computational facilities and has access to industry-standard EDA tools like Cadence Virtuoso, Mentor Graphics, Xilinx Vivado, Synopsis, etc. B.Tech and M.Tech practical courses related to VLSI are conducted in this laboratory. The M.Tech students with the specialization on Microelectronics & VLSI Design access the lab facilities heavily during their One-year dissertation period. Apart from that, Institute Research Scholars working in analog / digital VLSI or device modeling access this lab on a regular basis for their computational and research purposes. In this lab, the complete VLSI design cycle consisting of the steps like schematic design, floor-planning, placement, routing, parasitic extraction, and post-layout simulation can be performed for analog, digital or mixed-signal circuits. Students can also perform experiments related to the design and synthesis of combinational circuits, sequential circuits, FSM using VHDL or Verilog in this laboratory. The lab has all the facilities necessary for semiconductor device modeling and process simulations.

*VLSI Design Laboratory*

- **Signal Processing Laboratory**

  The experiments corresponding to the Signals and Systems and Digital Signal Processing are performed in this Laboratory. The experiments including fundamental signal operations, analysis of LTI systems (linear convolution), Fourier analysis of periodic and non-periodic signals both in continuous and discrete-time and frequency domain representation of signals etc. are performed for the Signals and Systems Laboratory.

*Signal Processing & Computer Simulation Laboratory*

The Digital Signal Processing (DSP) Laboratory has both software and a hardware component. In the software part, students carry out number of simulations, illustrating some of the fundamental concepts and applications of digital signal processing, such as quantization, sampling and aliasing, signal generation and manipulation, block processing by convolution using overlap save and overlap add method, signal enhancement and noise reduction filters, direct, canonical, and cascade realizations of digital filters, spectral analysis by the DFT and FFT, the design of IIR, and FIR filters for band pass, band stop, low pass and high pass filters, and digital audio effect applications. The hardware part of the laboratory illustrates the programming of real-time signal processing algorithms. This course enable the students to understand handling of discrete / digital signals, the basic operations of signal processing, the design and analyzing the linear time-invariant (LTI) systems and compute its response, analyze the spectral characteristics of signals using Fourier analysis, analyze the systems using Laplace transform and Z-transform, the design IIR, and FIR filters for bandpass, band stop, low pass, and high pass filters and design the signal processing algorithm.

- **Optical Communication Laboratory**

  Various experiments related to Optical Communication can be performed in this laboratory with training systems such as optical network system, Erbium Doped Fiber Amplifier Training System, Fiber Optic Trainer Kit for glass and plastic fiber, Fiber Optic, Connector and Splicing Kit etc. Such equipments are useful for studying chromatic dispersion, Diode laser characterization, Bragg Grating characterization, observation of various modes, Numerical Aperture Measurement of Optical Glass Fiber etc. The experiments are useful for the students in implementing their knowledge regarding optical communication systems practically.

*Optical Communication and IoT Laboratory*

- **Internet-of-Things (IoT) and Artificial Intelligence (AI) Laboratory**

  The Internet-of-Things (IoT) laboratory is useful for the UG, PG students to cope up with the current technologies. This laboratory is equipped with systems such as IoT mote with highly integrated system on Chip compliant to IEEE 802.15.4, RF subsystem and Security subsystem, Wi-Fi mote with wireless MCU with built-in Wi-Fi protocol stack targeted for IoT, SOC based device for Bluetooth Low Energy based applications, Sensor mote with various sensors such as Temperature & Relative Humidity Light Intensity, Proximity Sensing.

  **Artificial Intelligence Laboratory** facilitates UG and PG students to smartly deal with various real-world problems or model thereof. This laboratory is equipped with Python and Tensor flow to conduct experiments on Search operations following Search algorithms, Multi-agent games, Genetic Algorithms and Optimization, Neural Network and Fuzzy Logic Applications and Planning. Also, MATLAB based experiments on Genetic Algorithms, Neural Network and Fuzzy Logic are included in this Laboratory.

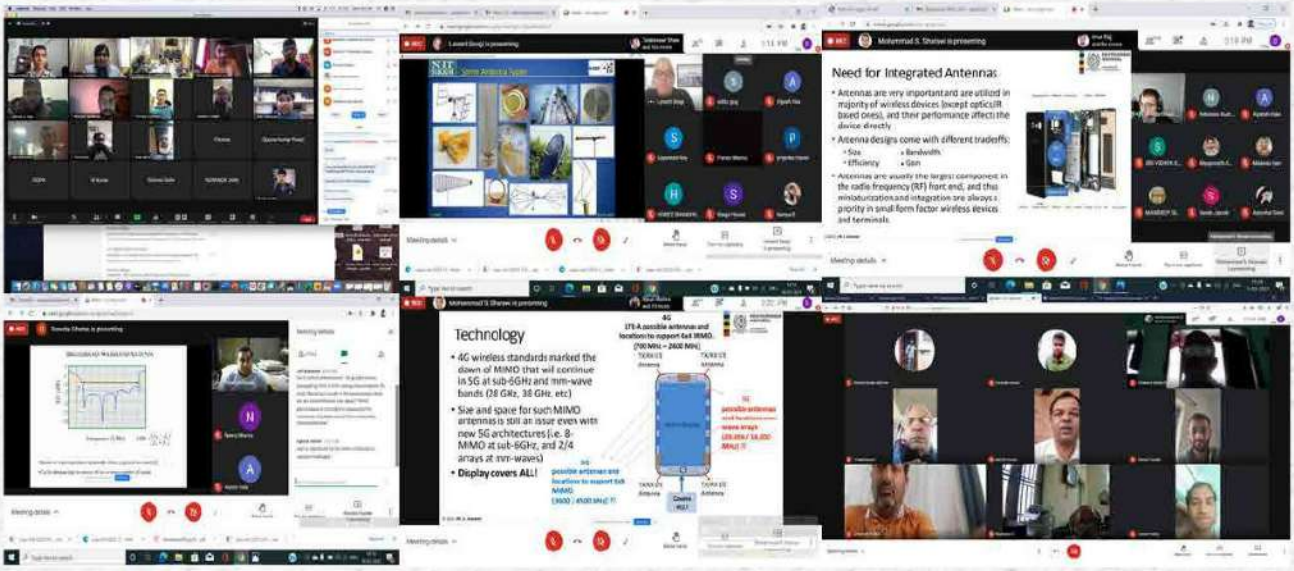
## Expert's Lecture / Seminar / Workshop / Short Term Course organized by the Department

| Event | Resource Person(s) | Date(s) of Event |
|---|---|---|
| Online Lecture on "Cognitive Radio Technology: Concept, Evolution and Antenna Requirements" | Prof. Chinmoy Saha, Department of Avionics, IIST, Trivandrum, Kerala | 19.09.2020 |
| TEQIP-III sponsored Online Workshop on Machine Learning and Speech Processing | 1. Prof Richi Nayak, QUT, Brisbane Australia<br>2. Dr. Prasanta Kumar Ghosh, IISc Bangalore<br>3. Prof. S.R.M. Prasanna, IIT Dharwad<br>4. Dr. Narender N P, Aalto University<br>5. Prof. Mikko Kurimo, Aalto University, Finland.<br>6. Dr. Santosh K Vipparthi, MNIT Jaipur<br>7. Prof. Sat Gupta, USA<br>8. Prof. K. S. Rao, IIT KGP<br>9. Prof. Samudra Vijaya K, TIFR Mumbai<br>10. Dr. Sudarsana Reddy Kadiri, Aalto University, Finland<br>11. Dr. Syed Shahnawazuddin, NIT Patna | 15th Feb. to 19th Feb. 2021 |
| TEQIP-III sponsored Online STC on Emerging Trends on Internet of Things with Experimental Learning | 1. Prof. Dhananjay Singh, Hankuk University of Foreign Studies<br>2. Dr. Amit Singhal, Bennett University<br>3. Dr. Pilli Emmanuel, Shubhakar, MNIT Jaipur<br>4. Prof. Brejesh Lall, IIT Delhi<br>5. Dr. Madhusudan Singh, Woosong University<br>6. Dr. N. S. Rajput, IIT (BHU)<br>7. Service Engineer, Entuple Technology<br>8. Service Engineer, CDAC, Bangalore<br>9. Service Engineer, Edgate Technology<br>10. Service Engineer, Keysight India | 22nd to 27th of February, 2021 |

| Event | Resource Person(s) | Date(s) of Event |
|---|---|---|
| TEQIP-III sponsored Online Workshop on Modern Antennas for Present and Futuristic Wireless Communication Technology | 1. Prof. Satish Kumar, Director, NIT Kurukshetra<br>2. Prof. Dr. Levent Sevgi, Professor, Okan University, Istanbul<br>3. Dr. Goutam Chattopadhyay, Senior Research Scientist, NASA-JPL, California Institute of Technology<br>4. Prof. Pradip Kumar Jain, Director, NIT Patna<br>5. Prof. Satish K. Sharma Director, Antenna & Microwave Lab, San Diego State University<br>6. Prof. Rowdra Ghatak, Professor, NIT Durgapur<br>7. Prof. Debatosh Guha, Abdul Kalam Technology Innovation National Fellow, and Professor, Institute of Radio Physics and Electronics, University of Calcutta<br>8. Prof. M. M. Sharma, Professor, MNIT Jaipur<br>9. Prof. Mohammad S. Sharawi, Département de génieélectrique Polytechnique Montréal<br>10. Prof. S. S. Pattnaik, Director, NITTR Chandigarh<br>11. Shri. Rajeev Jyoti, Distinguished Scientist & Deputy Director, SAC, ISRO | 8th to 13th of March, 2021 |
| TEQIP-III sponsored Online STC on Modern Wireless Communication Systems and Antenna Engineering with Experimental Learning | 1. Prof. Nuno Borjes Carvalho, Full Professor and a Senior Research Scientist with the Institute of Telecommunications, University of Aveiro<br>2. Prof. Arturo, YIC Technologies<br>3. Dr. Sayantan Dhar, Bosch Engineering and Business Solutions<br>4. Dr. Somak Bhattacharyya, Indian Institute of Technology, Banaras Hindu University<br>5. Dr. Aashish Mathur, IIT Jodhpur<br>6. Dr. Debdeep Sarkar, IISc Bangalore<br>7. Service Engineer, Keysight India<br>8. Service Engineer, Akademika, Pune, India | 15th to 20th of March, 2021 |

## Glimpses of various online events organized by the Dept. of ECE




## Outreach Activities

1. Dr. Surajit Kundu delivered invited lectures on " Evolution of 5G communication Technology from Antenna Engineer's Perspective: Part 1: Evolution from 1G to 5G Communication Technology and Part 2: Recent Developments in Antenna Engineering for 5G Communication Technology" in the FDP on "Machine learning based 5G communication systems," organized by SENSE, VIT, Vellore on 05.01.2021 (10AM-1PM).
2. Dr. Surajit Kundu delivered invited talk on "Evolution of 5G Communication Technology from Antenna Engineer's perspective" in a AICTE-AQIS Sponsored Short Term Training Program (STTP) on "AI and 5G Communication Technology," organized by Department of Electronics & Communication, Poornima College of Engineering, Jaipur on 08.12.2020.
3. Dr. Surajit Kundu delivered expert's lecture on "Frequency Selective Surfaces in Remote Sensing and Sub-surface Scanning Applications" in a ATAL FDP organized by Dept. of Physics, Burdwan University on 04.11.2020.
4. Dr. Surajit Kundu delivered invited talk on "Printed Ultra Wideband Antennas for Modern Communication Engineering Systems" in a webinar Organized by Dept. of ECE, Dr. B. C. Roy Engineering College (BCREC), Durgapur and IEEE Student Branch, BCREC on 19.09.2020.
5. Dr. Surajit Kundu delivered invited talk on "Communication Engineering: Past, Present and Future" in the webinar session organized by Dept. of Applied Science and Humanities, Guru Nanak Institute of Technology on 05.05.2020.
6. Dr. Surajit Kundu contributed as Programmer Committee member and Reviewer of TEQIP-III sponsored International Conference Artificial Intelligence: Advances and Applications, March 27-28, 2021, organized by Poornima College of Engineering, Jaipur and Rajasthan Technical University, Kota.
7. Dr. Surajit Kundu reviewed chapter 8 of the book Digital Communication Systems by Simon Haykin, Wiley on request from Wiley India.
8. Dr. Surajit Kundu reviewed Reputed International Journals such as IET Microwaves, Antennas & Propagation, International Journal of RF and Microwave Computer-Aided Engineering, Radioengineering, Journal of Circuits, Systems, and Computers, Advanced Electromagnetics etc.
9. Dr. Ayan Chatterjee delivered a lecture on "Frequency Selective Surfaces: Filtering and beyond" in the Webinar organized by IEEE APS Student Branch, Indian Institute of Information Technology Design and Manufacturing Jabalpur (IIITDM) on 13th February, 2021.
10. Dr. Ayan Chatterjee delivered a lecture on "Filter for Wireless Communication Application - A Different Perspective" in the Webinar organized by Pailan Technical Campus and Pailan College of Management & Technology on 28th August, 2020.
11. Dr. Ayan Chatterjee served as a Session Chair in the 6th International Conference on Optoelectronics and Applied Optics (OPTRONIX-2020) organized by University of Engineering and Management, Kolkata on June 8-10, 2020.
12. Dr. Avinash Kumar delivered special lecture on Basics of MATLAB Coding on Digital Signal Processing (Government Polytechnic, Bhagalpur, Bihar)

13. Dr. Avinash Kumar delivered special lecture on Digital Design and Emerging Trends in Signal Processing (Engineering College Bikaner, Rajasthan)

## Awards / Achievements

1. Dr. Ayan Chatterjee selected as a Senior Member of International Union of Radio Science (URSI), Belgium in 2020.

## Ongoing Projects in the Department

1. **SMDP C2SD:** Versatile Data Acquisition & Signal Processing Platform for Seismic Application, funded by MeitY, Govt. of India.
2. **Visvesvaraya Project: Design of application specific IC (ASIC),** funded by MeitY, Govt. of India.
3. **Design of an All Rate Clock Divider without a Phase Mismatch or Duty Cycle Distortion**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India.
4. **Design and Development of High Gain Ultra-Wideband Antenna with Sharp Multiple Notches, for Surface Penetrating Radar Application**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India.

## Research Scholars in the Department

| Scholar | Research Topic | Supervisor(s) |
|---|---|---|
| Ms. Reshmi Dhara | Design of Circular Polarized Microstrip Antenna | Prof. M. M. Sharma and Dr. Sanjay Kumar Jana |
| Mr. Subhanil Maity | Design of Power and Area Optimized High Speed Frequency Divider | Dr. Sanjay Kumar Jana |
| Mr. Keshab Das | Design and Analysis of Wideband LC Voltage-Controlled Oscillator (VCO) for High Frequency Applications | Dr. Sanjay Kumar Jana |
| Ms. Nigidita Pradhan | Design and Analysis of Phase Frequency Detector with Minimized Dead Zone for High Frequency PLL | Dr. Sanjay Kumar Jana |
| Ms. Priti Gupta | Transconductance – Capacitance Filter Design for the PLL applications | Dr. Sanjay Kumar Jana |
| Ms. Jayati Rauth | Design and Optimization of High Electron Mobility Transistor | Dr. Sanjay Kumar Jana |
| Mr. Arnab Som | Modeling and Design of Semiconductor Devices | Dr. Sanjay Kumar Jana |
| Mr. Somnath Mahato | GNSS Real Time Kinematics (RTK) for towards enhance solution accuracy | Dr. Surajit Kundu |
| Mr. Atanu Santra | Indian Navigation System (NavIC) and Its Advantages | Dr. Surajit Kundu |

## Projects of Final Year PG (M. Tech) Students

| Roll No. | Student's Name | Title of Project | Name of Project Supervisor |
|---|---|---|---|
| M180016EC | Mr. Loknath Kundu | Design of low Power high speed CML Based Prescaler for High Speed Communication Applications | Dr. Sanjay Kumar Jana |
| M180017EC | Mr. Palash Patra | Validating Partial Reconfiguration for FPGA | Dr. Sanjay Kumar Jana |
| M180018EC | Mr. Asit Kumar Jha | Application of Unified Power format (VPF) 1.0 in the verifications of Low Power Design | Dr. Sanjay Kumar Jana |
| M180019EC | Assif Khan | Design and Modeling of 12C Master Controller | Dr. Sanjay Kumar Jana |
| M180020EC | Mr. Vipin Kumar | Design and Analysis of Voltage controlled Oscillator | Dr. Sanjay Kumar Jana |

## Projects of Final Year UG students

| Roll No. | Name | Project Area | Supervisor |
|---|---|---|---|
| B160001EC | Sumit Kumar | Solar Photovoltaic, Light Trapping in solar cell | Dr. Sukanta Dhar |
| B160002EC | Mohit Dutt Mathur | Speech Processing | Mr. Avinash Kumar |
| B160007EC | Aditya Shekhar | UWB Notch Antenna Design | Dr. Surajit Kundu |
| B160013EC | Vipashyana Sharma | Design of a biomedical antenna for patient health monitoring. | Dr. Surajit Kundu |
| B160014EC | Surisetti Lohith | Speech Enhancement | Mr. Avinash Kumar |
| B160023EC | Pramod Adhikari | Analog System Design and Optimization | Dr. Sanjay Kumar Jana |
| B160027EC | Rakesh Kumar Rai | Particle Swarm Optimization | Dr. Sudipta Das |
| B160032EC | M Aksheetha | Speech Enhancement | Mr. Avinash Kumar |
| B160051EC | Sanyam Chauhan | Error Control Coding using MATLAB | Dr. Surajit Kundu |
| B160057EC | Bikash Kumar | UWB Notch Antenna Design | Dr. Surajit Kundu |
| B160058EC | Meenakshi Parmar | Solar Photovoltaic, Light Trapping in solar cell | Dr. Sukanta Dhar |
| B160059EC | Avishek Kr Thakur | Microstrip Antenna | Mrs. Reshmi Dhara |
| B160069EC | Soni Reshmi | Analog VLSI Design | Dr. Sanjay Kumar Jana |
| B160070EC | Ambati Hemasree | Wireless Filter for High Frequency Application | Dr. Ayan Chatterjee |
| B160073EC | Raj Ratnam | Bandpass Frequency Selective Surfaces | Dr. Ayan Chatterjee |
| B160079EC | Ramesh Limboo | Solar Photovoltaic, Light Trapping in solar cell | Dr. Sukanta Dhar |
| B160090EC | Nagula Shivakumar | Modeling and Simulation of Semiconductor Devices | Mr. Jeetendra Singh |
| B160101EC | Gulshan Kumar | Wideband Slot Antennas | Dr. Ayan Chatterjee |
| B160103EC | Pranesh Chettri | Analog System Design and Optimization | Dr. Sanjay Kumar Jana |
| B160104EC | Pawan Kumar Gupta | Particle Swarm Optimization | Dr. Sudipta Das |
| B160111EC | Enalist Tamang | Microstrip Antenna | Mrs. Reshmi Dhara |
| B160112EC | Kota Hemanth Kumar | Speech Processing | Mr. Avinash Kumar |
| B160113EC | Diwakar Sharma | Analog VLSI Design | Dr. Sanjay Kumar Jana |
| B160114EC | Narbada | Modeling and Simulation of Semiconductor Devices | Mr. Jeetendra Singh |
| B160124EC | Rahul Rajpurohit | Error Control Coding using MATLAB | Dr. Surajit Kundu |
| B160125EC | Nim Lhamu Tamang | Analog VLSI Design | Dr. Sanjay Kumar Jana |
| B160126EC | Sang Dorjee Tamang | Particle Swarm Optimization | Dr. Sudipta Das |
| B160132EC | Dikshya Soni | Modeling and Simulation of Semiconductor Devices | Mr. Jeetendra Singh |

## Workshop / FDP / STC / IEP / Webinar Attended outside NIT Sikkim

| Sl. No. | Name of Participants | Title | Organizer | Date | Category |
|---|---|---|---|---|---|
| 1 | Nigidita Pradhan | How to build a Full Chip Verification Environment for Multi-Million Gate SOC | Verification Seminar, QSOCs | 05/06/2020 - 07/06/2020 | Webinar |
| 2 | | Emerging Trends in VLSI Design | SVNIT, Surat | 12/09/2020 -16/09/2020 | Faculty Development Programme |
| 3 | | Embedded System Design on FPGA - Covering Swadeshi Microprocessors | NIELIT Calicut | 05/10/2020 – 15/10/2020 | Instruction Enhancement Program |
| 4 | Priti Gupta | STC on Research Trends in VLSI Design | NITTTR, Chandigarh | 25/05/2020 – 29/05/2020 | Webinar |
| 5 | | STC on Research Oriented Project Work | NITTTR, Chandigarh | 11/05/2020- 15/05/2020 | Webinar |
| 6 | | STC on Data Analytics using Python | NITTTR, Chandigarh | 18/05/2020- 22/05/2020 | Webinar |
| 7 | | Analog / Mixed VLSI Circuits for Brain -Machine Interface | NIT Silchar | 12/10/2020 – 16/10/2020 | Webinar |
| 8 | Subhanil Maity | Full Custom Design Flow using 45 nm with Tanner Tool | CoreEL Technologies and Mentor | 08/04/2020 | Webinar |
| 9 | | Post COVID-19 Role of Science and Technology towards a Self-Reliant India | IEEE India Council | 19/05/2020 | Webinar |
| 10 | | Intel FPGA Webinar | Intel | 20/05/2020 | Webinar |
| 11 | | Heart to Brain Communication: Impact of RF Radiation | Department of Electronics and Communication Engineering, Mizoram University | 26/05/2020 | Webinar |
| 12 | | Solving Mixed-Signal Challenges using AMS Co-simulation with VCS | Synopsys | 28/05/2020 | Webinar |
| 13 | | Enabling Next-Generation SoC Design with machine Learning-Driven Implementation | Synopsys | 29/05/2020 | Webinar |
| 14 | | Tackling Reliability Challenges in Analog and Mixed-Signal Designs | Synopsys | 03/06/2020 | Webinar |
| 15 | | "Role of Channel State Information in Adaptation and Resource Allocation in Next Generation Wireless Systems" and "Wide Band Gap Semiconductor: Past, Present and Future" | Department of Electronics and Communication Engineering, Mizoram University | 03/06/2020 | Webinar |
| 16 | | How to Build a Full Chip Verification Environment for a Multi-Million Gate SoC | QSoC Technologies Pvt. Ltd., Bangalore | 05/06/2020 & 06/06/2020 | Webinar |
| 17 | | Efficient Physical Verification for Silicon Photonics Designs | Synopsys | 06/06/2020 | Webinar |
| | | Analog VLSI Design Flow: Specs to Final Product from Industry Perspective | Department of ECE and IEI ECE Student Chapter, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad in association with AMS Semiconductors, Hyderabad | 07/06/2020 | Webinar |

| Sl. No. | Name of Participants | Title | Organizer | Date | Category |
|---|---|---|---|---|---|
| 19 | | FPGA Prototyping-Why Build-Your-Own-Boards Arn't Cost Effective | Synopsys | 08/06/2020 | Webinar |
| 20 | | Art and Challenges of Writing Papers for IEEE Transactions | IEEE | 08/06/2020 | Webinar |
| 21 | | Recent trends in Computer Architecture, VLSI and Embedded Systems RCAVES-2020 | Department of ECE, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad | 08/06/2020 -13/06/2020 | Faculty Development Programme |
| 22 | | The Future of World Electronics and Possible Roles India can Play | IEEE | 09/06/2020 | Webinar |
| 23 | | 5G Communications | DMI College of Engineering in Association with Pantech E Learning | 10/06/2020 | Webinar |
| 24 | | Designing Power Solutions for RF Signal Chain Applications | Analog Devices | 11/06/2020 | Webinar |
| 25 | | PCB Design | Narsimha Reddy Engineering College, Hyderabad in Association with Pantech E Learning | 12/06/2020 | Webinar |
| 26 | | Designing Power Solutions for Battery-Powered / Portable Applications | Analog Devices | 12/06/2020 | Webinar |
| 27 | | Communication systems for 5G Applications | KGISL Institute of Technology, Coimbatore | 15/06/2020 | Webinar |
| 28 | | Trends in Publishing | Springer Nature | 16/06/2020 | Webinar |
| 29 | | The People and the Principles Behind Nature-The What, The Why and The How | Springer Nature | 18/06/2020 | Webinar |
| 30 | | Introduction of XILINX RFSoC | CoreEL Technologies and XILINX | 19/06/2020 | Webinar |
| 31 | | Emerging Trends in Electronics and Communication Engineering | Jalpaiguri Govt. Engineering College, West Bengal | 29/06/2020-30/06/2020 | Webinar |
| 32 | Dr. Ayan Chatterjee | Metamaterial & its Applications | IEEE Delhi Section APS Chapter – Jaipur in association with IEEE Rajasthan Subsection, MNIT Jaipur and Govt. Women Engineering College, Ajmer | July 27-31, 2020 | workshop |
| 33 | Dr. Rahul Pal | Machine Learning for Data Science using Python | NIT Warangal | March 1-10, 2021 | short-term course |
| 34 | Dr. Surajit Kundu | Post COVID-19: Science and Technology | SRM University-AP | 29th May, 2020 | Webinar |
| 35 | | Art & Challenges of writing Paper for IEEE Transactions | IEEE Bangalore Section | 8th June, 2020 | Webinar |
| 36 | | Electromagnetic Aspects of 5G Massive MIMO Systems: Antenna Design and Channel Modeling | IEEE Bangalore Section | 16th June, 2020 | Webinar |
| 37 | | RF Design/ VNA & its Application | Entuple & Aniritsu | 16th to 18th June, 2020 | Online FDP |

| Sl. No. | Name of Participants | Title | Organizer | Date | Category |
|---|---|---|---|---|---|
| 38 | Dr. Surajit Kundu | IEEE Senior Membership- Benefits and Application Procedures | IEEE Kerala Section | 27th June, 2020 | Webinar |
| 39 | | Recent Trends on RF & its Applications | IEEE APS Jaipur & IEEE Rajasthan Subsection | 26–30 June, 2020 | One-week lecture series |
| 40 | | Antenna Design & Simulation using CST Studio | IEEE AP-MTTs Kolkata Chapter | 29–30 June, 2020 | Webinar |
| 41 | | Phased Array Antennas: System Engineering Perspective | IEEE Bangalore Section | 31st July, 2020 | Webinar |
| 42 | | Probing the Universe Via Radio Waves: From the Perspective of Microwave Engineering | IEEE MTTs Student Branch Chapter, IIT (BHU) | 04.07.2020 | Webinar |
| 43 | | IEEE National Workshop on Antenna Technology | IEEE AP/MTT Joint Chapter, Gujarat Section | 28.11.2020 & 05.12.2020 | Webinar |
| 44 | | Microwave and Antenna Applications in 5G | IEEE AP/MTT Chapter and IEEE Bangalorew Section | 8th to 13th December 2020 | Workshop |

## Technical Events organized by Anuvrat, the Departmental Club

ANUVRAT is the Departmental Club of Electronics and Communication Engineering, envisioning the never-ending innovation to build an ultimate perspective of new creation, with a motto to encourage students towards research and developmental works. The Club provides the young engineers a platform to put forward their ideas, innovations, and thought processes to the world. The technical events organized by Anuvrat are summarized below,

| Sl. No. | Event | Resource Person | Topic of Discussion | Date of Event |
|---|---|---|---|---|
| 1 | National Science Day Lecture | Prof. Sankar Kumar Pal, National Science Chair, Emeritus Professor, Distinguished Scientist and Former Director, ISI Kolkata | Granular Mining in Video Analytics | 28th February, 2021 |
| 2 | Vimrishyotsava (Alumni Talk)- Episode 1 | Mr. Navneet Kishan, SoC design Engineer at Intel Corporation | Digital VLSI Design | 21st March, 2021 |
| 3 | Vimrishyotsava (Alumni Talk)- Episode 2 | Mr. Rajat Kumar Sinha, PhD Scholar, University of Toronto. | Nanophotonics | 28th March, 2021 |
| 4 | Vimrishyotsava (Alumni Talk)- Episode 3 | Mr. Paras Ram Meena, Sales Officer, Hindustan Petroleum Corporation Limited | Financial Systems and Capital Market | 4thApril, 2021 |
| 5 | Vimrishyotsava (Alumni Talk)- Episode 4 | Mr. Nishant Choudhary, Engineer, Intel Corporation | Embedded Systems | 11th April, 2021 |
| 6 | Vimrishyotsava (Alumni Talk)- Episode 5 | Mr. Shubham Jain, Software Development Engineer, Flipkart | BitCoin-Working, Methodology & Blockchain Technology | 18thApril, 2021 |
| 7 | Vimrishyotsava (Alumni Talk)- Episode 6 | Mr. Ankur Jha, Deputy Engineer, Bharat Electronics Limited | Basics of RADAR Systems | 25th April, 2021 |

# Department of Electrical and Electronics Engineering

*The beauty of electricity or of any other force is not that the power is mysterious, and unexpected, touching every sense at unawares in turn, but that it is under law, and that the taught intellect can even now govern it largely.*

**Michael Faraday**

The Department of Electrical and Electronics Engineering is one of the principal and significant departments in National Institute of Technology Sikkim and started functioning since inception of the Institute in 2010. The Faculty members and Staffs of the Department are completely focused in maintaining education of the highest standards through quality teaching and research in multidisciplinary fields. Endowed with a surfeit of Faculty members striking the right balance between dynamism and experience, the Department offers an entire palette of Undergraduate (B.Tech in Electrical and Electronics Engineering), Postgraduate (M.Tech in Electrical Engineering with specialization in Control, Power, and Electric Drives) and Research Programs (Ph.D).

## Vision

To impart quality teaching and research to overcome the challenges of the present times, pave the path for development for a better future and thereby add values to the society.

## Mission

The Department aims to realize the Vision through the following Mission:

- To provide outcome-based teaching and research for practical Engineering skills on social needs.
- To create an environment for Students, Staff and Faculty members to nurture and develop all-round capabilities along with moral and ethical values.

The highly accomplished Faculty members of the Department have expertise in manifold cutting-edge research fields. The broad areas of Research in the Department encompass, but do not limit itself to, Control Systems, Robotics, Power Electronics, Power Quality, Power Systems, Hybrid Micro-grids, Smart Grid Technologies, Electric Vehicles, Application of Nonlinear Dynamics in Engineering, Renewable Energy, and Development and Application of Soft Computing Techniques. The Department takes immense pride in its strong Industry-Institute interactions, and has committed itself to adoption and accomplishment of multifarious potential projects.

The Department also aims to develop active collaboration with various industries in the power sector. The Department has earned wide reputation in the national and global academic sphere. Currently, the Department has an annual first year intake of 30 students in B.Tech. program in Electrical and Electronics Engineering.

At the Postgraduate level, the Department is offering M.Tech. program in Electrical Engineering (Control, Power, and Electric Drives) with intake of 22 students. From 2020, the Department is admitting students in the vacant seats of M. Tech. through Institute Admission Test. The department got good response from the students across India and a total of 7 students took admission through this admission process. In future, the Department is planning to offer separate M. Tech. specialization in the field of Control Systems, Electrical Drives and Power Systems. In addition to the above, the Department offers regular Ph.D. program in various areas of specialization in Electrical and Electronics Engineering. These include Control Systems, Power System Operation, Power Quality, Renewable Energy Sources, Smart Grids, Optimization, Power System Dynamics and Stability, Flexible AC Transmission, High Voltage Direct Current, Electric Drives and Hybrid Electric Vehicles.

Presently, the Department has almost all laboratories equipped with state-of-the art equipment and latest version of software platforms. With inputs from eminent personalities who are invited in various workshops organized, the Department has modified the laboratory infrastructure to enhance the understanding of the theoretical concepts. The laboratories are equipped with sophisticated equipment, test setups, embedded controllers, digital signal processors, power inverter-converters, various electrical drives, etc. to name a few. The Department is involved in carrying out several sponsored R&D projects funded by national agencies like MeitY and TEQIP III, Govt. of India. The Department also organizes Faculty Development Programs, Workshops, Expert Lectures, etc. from time to time.

The Faculty members of the Department have been regularly contributing to International and National Journals of repute like IEEE Transactions and IEEE Proceedings, IET, journals on Electrical Engineering from Elsevier, etc. along with Proceedings of National and International Conferences. The Department is planning to have new laboratories for Testing, Calibration and Standardization, Photovoltaic and Energy Storage, Power Quality and Energy Conservation and Electric Drives.

The Department has gradually developed into one of the best departments of NIT Sikkim. The placement record has shown that the students of the Department were successful in getting lucrative placements based on their interests in different fields. Top recruiters such as Qualcomm, L&T, Power Grid Corporation of India Ltd., etc. have offered appointments to the students with a pay package of over Rs. 10 Lakh per annum. Other recruiters from core Engineering and allied sectors like Vedanta Group, Wipro, Tata Power, Reliance etc. have recruited students from the Department with attractive pay packages. Consistent placement record reflects the dedication and contribution of the Department. The Graduates of the Department had occupied important positions in both government as well as private organizations. Dr. Anjan Kumar Ray is nominated for the National Innovation and Startup Policy (NISP) for the implementation programme of MoE Innovation Cell and AICTE. He is the Institute Coordinator for the cGanga project in collaboration with IIT Kanpur. Moreover, Dr. Ray is the Nodal Coordinator for NIT Sikkim for the Virtual Laboratory, an initiative of the Ministry of Education under the National Mission on Education through ICT (NMEICT).

The students are encouraged to go for higher studies and build their career in R&D sector. Some of our past students have completed their Post-Graduation from eminent and premier institutes of India and abroad. One of the students of 2020 graduating batch of the Department had secured AIR 217 in GATE 2021 examination. There are several other students from the pass-out batches who secured good rank in different competitive examinations despite the pandemic situation.

The students are motivated to pursue technical and creative activities besides classroom teaching and laboratory exercise through technical fests like 'Abhiyantran' organized by the Institute. They are also encouraged to participate in various learning activities including attending and presenting research papers at International / National Conference / Seminars.

## Programs / Courses offered by the Department

- B.Tech in Electrical and Electronics Engineering
- M.Tech in Electrical Engineering (Control, Power and Electric Drives)
- Ph.D in Electrical Engineering

# Faculty Details

- **Dr. Sourav Mallick**
  Assistant Professor and HOD
  Ph.D (NIT Durgapur, 2014)
  **Area of Interest:** Power System State Estimation, Power System Transmission and Distribution, Power System Stability and Control, Soft Computing.

- **Dr. Anjan Kumar Ray**
  Assistant Professor
  Ph.D (IIT Kanpur,2009)
  **Area of Interest:** Control Systems, Robotics and Intelligent Systems, Machine Learning, Sensor Fusion and Smart Home/Environment.

- **Dr. Aurobinda Panda**
  Assistant Professor
  Ph.D (IIT Roorkee, 2016)
  **Area of Interest:** Application of Power Electronics in Renewable Energy Sources.

- **Dr. Molay Roy**
  Assistant Professor
  Ph.D (IIEST Shibpur, 2017)
  **Area of Interest:** Power Electronics Converter and Controller.

- **Dr. Pradeep Kumar**
  Assistant Professor
  Ph.D (NIT Jamshedpur, 2017)
  **Area of Interest:** Power Quality, Control Systems, Renewable Energy Systems, Power Electronics.

# Temporary Faculty Members

**Dr. Amit Kumar Yadav**

**Dr. Kuntal Mandal**

**Dr. Abhishek Rajan**

**Dr. Anulekha Saha**

**Dr. Prasenjit Dey**

**Mr. Jogi Paul**

# Staff Details

**Ms. Deepika Chettri**
Technical Assistant

**Mr. Manish Kumar**
Technician

## Membership of Technical Association / Society

| S. No. | Name | Technical Societies | Membership Type |
|---|---|---|---|
| 1 | Dr. Sourav Mallick | IEEE.<br>IEEE Power and Energy Society. Institution of Engineers (India). | Member<br>Member<br>Associate Member |
| 2 | Dr. Anjan Kumar Ray | IEEE.<br>Smart Cities Community, IEEE.<br>Internet of Things Community, IEEE.<br>IEEE Systems Council.<br>IEEE Sensors Council.<br>Systems, Man, and Cybernetics Society.<br>IEEE Robotics and Automation Society.<br>IEEE Control Systems Society. | Member<br>Member<br>Member<br>Member<br>Member<br>Member<br>Member<br>Member |
| 3 | Dr. Aurobinda Panda | IEEE | Member |
| 4 | Dr. Pradeep Kumar | System Society of India.<br>International Association of Computer Science and Information Technology (IACSIT).<br>International Association of Engineers (IAENG).<br>International Association for Cyber Science and Engineering (IACSE).<br>International Society for Research and Development (ISRD). | Life Membership<br>Life Membership<br>Life Membership<br>Life Membership<br>Life Membership |
| 5 | Dr. Kuntal Mandal | IEEE.<br>IEEE CAS (Circuits and Systems Society)<br>IEEE IES (Industrial Electronics Society) | Member<br>Member<br>Member |
| 6 | Dr. Anulekha Saha | Institution of Engineers (India) | Associate Member |

## Laboratory Facilities

### 1. Basic Electrical Engineering Laboratory

The Basic Electrical Engineering Laboratory will help the students to develop a strong foundation on the basics of Electrical Engineering. Each experiment is curated to show the practical aspect of theories learnt in earlier semesters. Through the experiments, the students learn the applications of different network theorems, different types of loads and their voltage-current characteristics, power measurements of balanced and unbalanced loads, designing DC power supplies and sources, and also safety issues such as fuse rating for circuits. The students are made capable to apply the knowledge gained from the laboratory to all other areas of Electrical Engineering.

### 2. Measurement Laboratory

The Measurement Laboratory in the Department has the objective to familiarize the students with the operation of basic laboratory instrumentation such as energy meter, multi meter, voltmeter, ammeter etc. Another goal is to re-enforce the practical knowledge with practice and analysis of result obtained, and to learn correct laboratory procedures and techniques. This is accomplished by building, testing, and taking measurements on simple circuits. In execution of experiments, the students can distinguish between performance and the methodology behind various parts of an instrument.

### 3. Control Systems Laboratory

The Control Systems Laboratory course provides conceptual and hands-on practice of various aspects of control systems including advanced control, nonlinear control, and intelligent control. Here, the students get familiarized with various open source platforms e.g. SCILAB, C/C++ to carry out simulations. It also has hardware setups which includes linear double inverted pendulum and rotary double inverted pendulum. Students are also trained for future trends on the uses of microcontrollers and sensors. Through these simulation and hardware facilities, students get familiarized with different aspects of system modeling and simulations. They study system responses and stability aspects. Students are trained to design controllers and observers for different systems. Moreover, they are given exposure to utilize machine intelligence to incorporate those into system modeling and control.

### 4. Electrical Machines Laboratory

The Electrical Machines Laboratory is one of the major subject in EEE discipline. By performing several experiments on DC and AC machines, the students can correlate their theoretical understanding on the principles of operation and construction of direct current machines and alternating current machines with the practical one. For better understanding, the Department has procured open machine set up which had become a very useful tool to enhance the knowledge on machines for the UG and PG students.

### 5. Power Systems Laboratory

The Power System Laboratory in the current UG curricula is taught in three semesters, considering the importance of the subject in the present society. By performing various experiments in power systems the students will be able to design, analyze and solve various relevant engineering problems related to power transmission and distribution systems, faults, system stability etc. The Department had already procured a transmission line analyzer set up which gives the students an insight towards the power transmission line. At present, 200 km three phase single circuit and 600 km single phase circuit can be simulated for different types of conductors and cables. Moreover, three phase and single fault simulations are also possible in that analyzer. The Department is planning to expand this laboratory with a complete set up of analog and digital relays. The Department is also planning to setup one renewable energy laboratory considering the present day power scenario.

### 6. Power Electronics Laboratory

The students of the Department can perform different experiments on the operation and characteristics of power semiconductor devices and other passive components and their application in solving practical Engineering problems. The Department is in the process of improving the facilities provided in this laboratory which will give higher practical exposure to the operating principles, design and synthesis of different power electronic converters. The curricula of the laboratory course have been designed in such a way that it introduces students to the industrial control of power electronic circuits as well as safe electrical connection and measurement practices. In order to interface between software and hardware of different engineering models of the department, the department had procured dSpace which would be helpful to the students for prototyping.

*Fig. 1 Control System Laboratory*

*Fig. 2 Electrical Machine Laboratory*

*Fig. 3 Open Machine Laboratory*

*Fig. 4 Power Systems Laboratory*

*Fig. 5 Basic Electrical Laboratory*

*Fig. 6 Simulation Laboratory*

*Fig. 7 Electrical Measurement Laboratory*

*Fig. 8 Power Electronics Laboratory*

## Special Lectures / Seminars / Workshops organized by the Department

- The department of EEE had arranged 5 five-day Workshops on different fields of Electrical Engineering in this session through online mode. The Undergraduate, Post-graduate, Ph. D. Students from the Institute as well as the Faculty members have participated in these workshops. Moreover, there are several participants from India and abroad who had met through these online workshops. On an average, 450 participants were registered in these series of workshops and their active participation made all the workshops a grand success. The Workshops, organized by the Department, are listed hereunder:

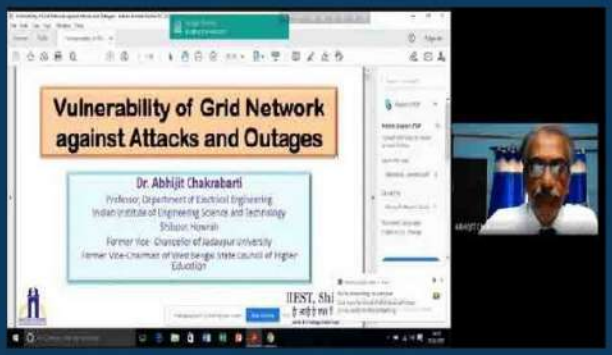
| Title | Name of Resource Person (s) / Participants | Date |
|---|---|---|
| Recent Trends in Power Systems 2021 (RTPS2021) | 1. Prof. Abhijit Chakrabarti, Electrical Engineering, IIEST Shibpur.<br>2. Dr. Aniruddha Bhattacharya, Electrical Engineering, NIT Durgapur.<br>3. Prof. Chandan Kumar Chanda, Electrical Engineering, IIEST Shibpur.<br>4. Prof. Debapriya Das, Electrical Engineering, IIT Kharagpur.<br>5. Prof. K Shanti Swarup, Electrical Engineering, IIT Madras.<br>6. Prof. Khaleequr Rehman Niazi, Electrical Engineering, MNIT Jaipur.<br>7. Prof. Nidul Sinha, Electrical Engineering, NIT Silchar.<br>8. Dr. Rohit Bhakar, Electrical Engineering, MNIT Jaipur.<br>9. Mr. Supriya Paul, Deputy General Manager, Power Grid Corporation of India Limited.<br>10. Prof. Swapan Kumar Goswami, Electrical Engineering, Jadavpur University.<br>11. Dr. Tanmoy Malakar, Electrical Engineering, NIT Silchar.<br>12. Dr. Tulika Bhattacharjee, Engineering Officer, Central Power Research Institute. | 23 - 27th Feb, 2021 |
| Application of Power Electronics and Drives to Industry | 1. Prof. Bhim Singh, IIT Delhi.<br>2. Prof. Mainak Sengupta, IIEST Shibpur.<br>3. Prof. Mukesh K. Pathak, IIT Roorkee.<br>4. Prof. Santanu K. Mishra, IIT Kanpur.<br>5. Prof. Anup K. Panda, NIT Rourkela.<br>6. Dr. Santanu Kapat, IIT Kharagpur.<br>7. Dr. Ranjan K. Behera, IIT Patna.<br>8. Shri Deepak Saini, BHEL, Bhopal.<br>9. Shri Pradeep K. Sanodiya, POSOCO, Mumbai. | 2nd - 6th March, 2021 |

| Title | Name of Resource Person (s) / Participants | Date |
|---|---|---|
| Control Systems and Applications | 1. Prof. Mahesh Chandra Govil Director, NIT Sikkim.<br>2. Prof. Byrana Nagappa Suresh Chancellor, IIST Trivandrum.<br>3. Prof. Vinod Kumar Vice Chancellor, JUIT, Himachal Pradesh.<br>4. Prof. Soumitro Banerjee Dept. of Physical Sciences, IISER Kolkata.<br>5. Prof. Laxmidhar Behera Dept. of EE, IIT Kanpur.<br>6. Prof. Debasish Ghose Dept. of Aerospace Engg., IISc Bengaluru.<br>7. Prof. Amit Patra Dept. of EE, IIT Kharagpur.<br>8. Prof. Binoy Krishna Roy Dept. of EE, NIT Silchar.<br>9. Prof. Aparajita Sengupta Dept. of EE, IIEST Shibpur.<br>10. Dr. Santanu Kapat Dept. of EE, IIT Kharagpur.<br>11. Dr. Indrani Kar Dept. of EEE, IIT Guwahati | 9th -13th March, 2021 |
| Fuzzy Logic Systems in Engineering Applications (FLSEA 21) | 1. Prof. N.P. Padhy, IIT Roorkee.<br>2. Prof. Niladri Chatterjee, IIT Delhi.<br>3. Prof Shiv Prasad Yadav, IIT Roorkee.<br>4. Prof. Snehashish Chakraverty, NIT Rourkela.<br>5. Prof. Nirmal Baran Hui, NIT Durgapur.<br>6. Prof. Rajesh Kumar, MNIT Jaipur.<br>7. Dr Swagatam Das, ISI Kolkata.<br>8. Dr. Haider Banka, IIT (ISM) Dhanbad.<br>9. Dr V Lakshmana Gomathi Nayagam, NIT Trichy. | 15th - 19th March, 2021 |
| Effective Research Proposal Writing-Challenges, Strategies and Guidelines | 1. DR. Gaurav Gupta, Scientist-E, Cyber-laws and E-security Group, Government of India.<br>2. Ms. Priyanka Tomar, Former Solution Architect, National Cyber Research and Innovation.<br>3. Dr. Jaideep Kumar Mishra, Joint secretary, Minitry of Electronics and Information Technology, Government of India.<br>4. Prof. Mainak Sengupta, IIEST Shibpur.<br>5. Prof. Hiranmay Saha, Centre of Excellence for green Energy and Sensor Systems, IIEST Shibpur.<br>6. Prof. Ajoy Kumar Roy, Director, JISIASR Kolkata.<br>7. Prof. Sushil Kumar, Sr. Principal Scientist, CSIR-NPL.<br>8. Prof. Adrijit Goswami, Mathematics Department, IIt Kharagpur.<br>9. Prof. Bhargav Maitra, Department of Civil Engineering, IIT Kharagpur.<br>10. Prof. Anirban Gupta, Department of Civil Engineering, IIEST Shibpur.<br>11. Prof. Anirban Chakraborti, School of Computational and Integrative Sciences, JNU.<br>12. Dr. Rohit Bhakar, Department of Electrical Engineering, MNIT Jaipur.<br>13. Prof. Brajesh Kumar Dubey, IIT Kharagpur.<br>14. Dr. Rajeev Sharma, Scientist-F, FFT Divison, Government of India.<br>15. Prof. Bidyadhar Subudhi, Department of Electrical Engineering,IIT Goa | 9th-13th March, 2021 |

## A few moments of the Workshops

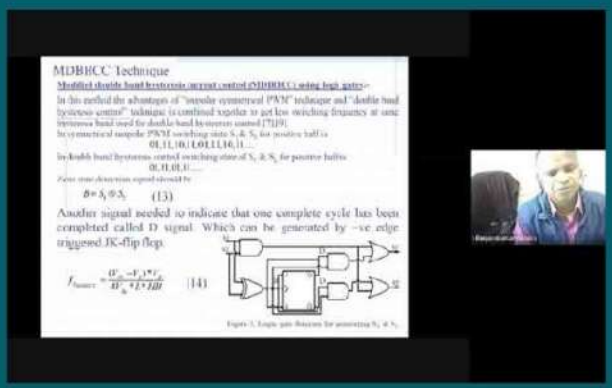
### Recent Trends in Power Systems 2021



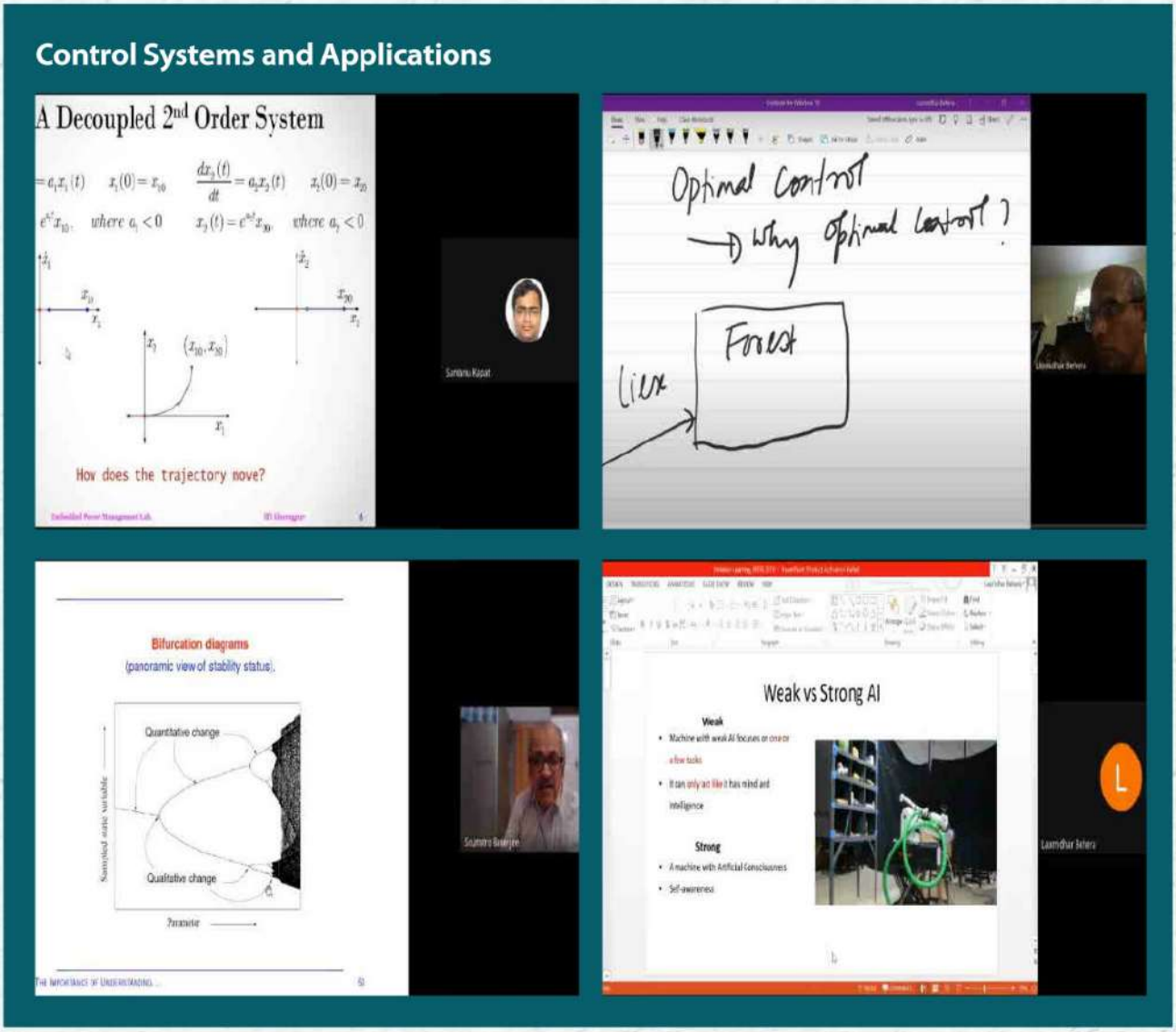




## Applications of Power Electronics and Drives to Industry



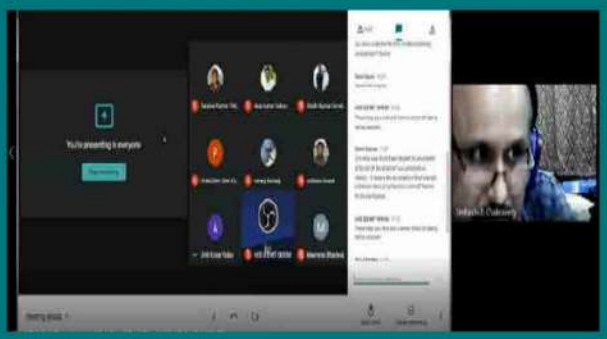


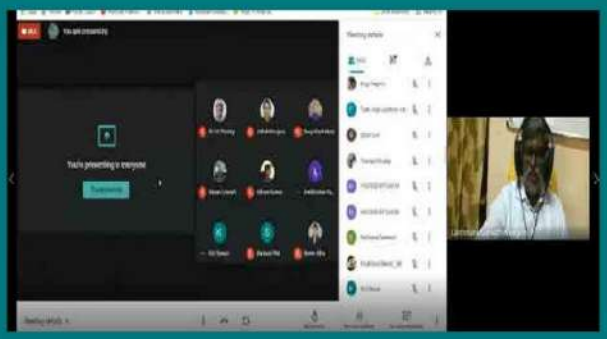

Power Exchange across regions & countries
30.05.2019 (Thursday)
4136
2349
1285
985
Pradeep Sahadeva

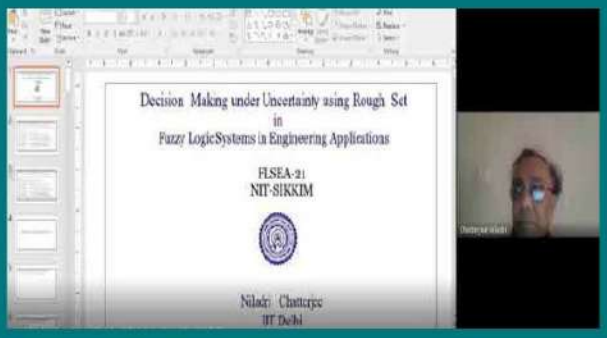

Control Systems and Applications
A Decoupled 2nd Order System
How does the trajectory move?
Optimal control
Why Optimal control ?
Forest
Bifurcation diagrams
(panoramic view of stability status).
Quantitative change
Qualitative change
Weak vs Strong AI
Weak
Strong

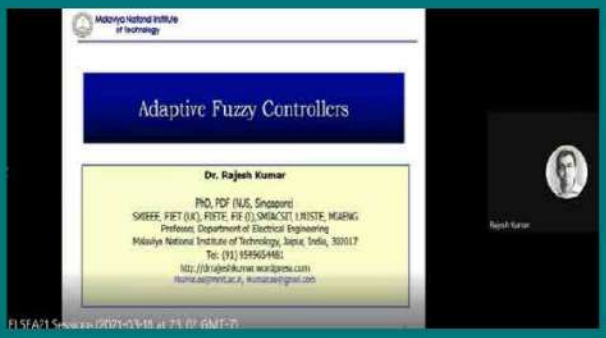
## Fuzzy Logic Systems in Engineering Applications

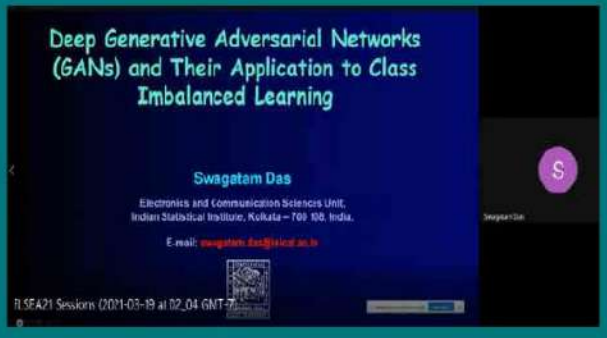







## Departmental Committees

| Sl. No. | Name of the Faculty Members | Name of the Committee |
|---|---|---|
| 1 | 1. Dr. Sourav Mallick, HoD and Convenor<br>2. Dr. Molay Roy (Convenor, DUGC)<br>3. Faculty Advisor of each Batch<br>i. Dr. Abhishek Rajan, Faculty Coordinator, 1st Year B. Tech<br>ii. Dr. Kuntal Mandal, Faculty Coordinator, 2nd Year B. Tech<br>iii. Dr. Amit Kumar Yadav, Faculty Coordinator, 3rd Year B. Tech<br>iv. Dr. Aurobinda Panda, Faculty Coordinator, 4th Year B. Tech<br>4. Dr. Anjan Kumar Ray, Member<br>5. Dr. Anulekha Saha, Member<br>6. Dr. Pradeep Mondal, Nominee of Dean Academic | Academic Performance Evaluation Committee (APEC) |
| 2 | 1. Dr. Molay Roy (Convenor, DUGC)<br>2. Dr. Sourav Mallick, HoD, EEE<br>3. Dr. Anjan Kumar Ray (Convenor, DPGC)<br>4. Dr. Kuntal Mandal, Nominee of HoD<br>5. Dr. Prasenjit Dey, Nominee of HoD | Departmental Undergraduate Committee (DUGC) |
| 3 | 1. Dr. Anjan Kumar Ray (Convenor, DPGC)<br>2. Dr. Sourav Mallick, HoD, EEE<br>3. Dr. Molay Roy (Convenor, DUGC)<br>4. Dr. Aurobinda Panda, Nominee of HoD<br>5. Dr. Pradeep Kumar, Nominee of HoD<br>6. Dr. Pratyay Kuila, Nominee of Chairperson Senate | Departmental Postgraduate Committee (DPGC) |

In order to maintain the laboratories of the Department, Faculty members along with Staffs were assigned. The list of Laboratory In-charge are appended hereunder:

| Sl. No. | Name of the Laboratory | Faculty In-charge | Assistant In-charge |
|---|---|---|---|
| 1 | Electrical Workshop | Dr. Sourav Mallick<br>Dr. Anulekha Saha | Ms. Deepika Chettri |
| 2 | Electrical Measurements Laboratory | Dr. Pradeep Kumar<br>Dr. Amit Kumar Yadav | Mr. Manish Kumar |
| 3 | Electrical Machines Laboratory | Dr. Molay Roy<br>Dr. Abhishek Rajan | Mr. Anil Gurjar |
| 4 | Power System Laboratory | Dr. Sourav Mallick<br>Dr. Prasenjit Dey | Mr. Manish Kumar |
| 5 | Control System Laboratory | Dr. Anjan Kumar Ray<br>Dr. Kuntal Mandal | Mr. Anil Gurjar |
| 6 | Power Electronics and Drives Laboratory | Dr. Aurobinda Panda<br>Mr. Jogi Paul | Ms. Deepika Chettri |

In this pandemic situation, the students were suffering with many problems. In order to cater the problems faced by the students, to council and to motivate them in this pandemic situation, the Department has opened one Covid Cell. The members are as follows:

| Sl. No. | Name of the Convener | Members |
|---|---|---|
| 1 | Dr. Sourav Mallick | Dr. Abhishek Rajan:1st Year, B. Tech.<br>Dr. Kuntal Mandal:2nd Year, B. Tech.<br>Dr. Amit Kumar Yadav: 3rdYear, B. Tech.<br>Dr. Prasenjit Dey: 4thYear, B. Tech.<br>Dr. Moloy Roy: M. Tech.<br>Dr. Anjan Kumar Ray: Ph. D.<br>Dr. Anulekha Saha: Female Students |

## Ongoing Projects / Schemes in the Department

1. **Dr. Anjan Kumar Ray** received Visvesvaraya Ph.D. project "Intelligent Networked Robotic Systems" along with Prof. Arun Baran Samaddar. One full time Ph.D. scholar is working in the Department under this project.
2. **Dr. Anjan Kumar Ray** – Development of a prototype of a quadruped and a high dexterity robotic platform.
3. **Dr. Aurobinda Panda** – Development of integrated power quality based photovoltaic distributed generation system.
4. **Dr. Molay Roy** – Design and Development of cascaded multi-level inverter for industry applications.

## Participation in Faculty Development Programs

| Sl. No. | Name of the Faculty | FDP Attended | Date | Organised By |
|---|---|---|---|---|
| 1. | Dr. Sourav Mallick | Building Institutes for Future | February 9-11,2021 | IIM Vishakhapatnam |
| | | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 2. | Dr. Anjan Kumar Ray | Professional Development Training | February 8-10,2021 | IIM Raipur |
| | | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 3. | Dr. Aurobinda Panda | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 4. | Dr. Molay Roy | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 5. | Dr. Pradeep Kumar | Green Energy Technologies for Sustainable Development | June 11-20, 2020 | NIT Kurukshetra and GEC Bikaner |
| | | Future trends in Green Technology | June 22-26, 2020 | MANIT Bhopal |
| | | Soft Computing Techniques (SCT-2020) | July 25-30, 2020 | Electrical Engineering Department, National Institute of Technology Srinagar, J&K |
| | | Advancements in Electrical Engineering: An Academic & Industrial Approach" | August 3-7, 2020 | Department of Electrical Engineering, National Institute of Technology, Silchar |
| | | Recent Trends in Power Electronics – Research Scope and Challenges | December 23-27, 2020 | Department of Electrical and Electronics Engineering, National Institute of Technology Karnataka |
| | | Energy Audit for Smart Grid Network | Nov 3- Dec 4 2020 | IIT Roorkee |
| | | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| | | Role of Power Electronics in Power Engineering | March 8-12, 2021 | IIT Gandhi Nagar |
| 6. | Dr. Amit Kumar Yadav | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 7. | Dr. Kuntal Mandal | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| 8. | Dr. Abhishek Rajan | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| | | FDP Renewable Energy organized | 3 to 5 August 2020 | NIST, Berhampur |
| 9. | Dr. Anulekha Saha | One Day Webinar on Electrical Power Systems, Renewable Energy, Smartgrids & Switchgear Protection using NEPLAN Simulation Software | 20th October 2020 | IndiaSoft Technologies (P) Ltd., Pune. |
| 10. | Dr. Prasenjit Dey | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |
| | | One Week Faculty Development Programme on "Modern Trends In Electrical Engineering" | June 23-27, 2020 | Dr. B. C. Roy Polytechnic, Durgapur<br>Dr. B.C. Roy Polytechnic |
| | | Faculty Development Program on "Recent Trends in Electrical Engineering | 14th to 18th July 2020 | Global Institute of Science and Technology |
| 11. | Mr. Jogi Paul | National Education Policy 2020 | March 1-5, 2021 | NIT Sikkim |

## Ph.D. Scholars

| Sl. No. | Name of the Scholar | Supervisor(s) | Area of Research |
|---|---|---|---|
| 1. | Mr. Arindam Singha | Dr. Anjan Kumar Ray and Prof. Arun Baran Samaddar | Intelligent Networked Robotic Systems |
| 2. | Mr. Arabinda Ghosh | Dr. Anjan Kumar Ray and Dr. Md. Nurujjaman | Dynamics and Stability of Complex Network |
| 3. | Mr. Sudhansu Sekhar Das | Dr. Aurobinda Panda | Application of Multilevel Inverter to Renewable Energy Systems |
| 4. | Mr. Amit Kumar | Dr. Pradeep Kumar | Power Quality Improvement using Custom Power Devices |
| 5. | Mr. Debanjan Mukherjee | Dr. Sourav Mallick | Power Line Harmonic Reduction Using FACTS |
| 6. | Mr. Rajnikant Sahoo | Dr. Molay Roy | Cascaded Multi-Level Inverter |
| 7. | Mr. Romio Atha | Dr. Sourav Mallick | Power System Protection |
| 8. | Ms. Shrabani Pal | Dr. Sourav Mallick and Dr. Anjan Kumar Ray | Power System Stability and Control |
| 9. | Mr. Roshan Pradhan | Dr. Aurobinda Panda | Distributed PV Generation System |

## Projects of Final Year UG Students

| Sl. No. | Name of the Supervisor | Project Title | Project Area | Name of the Student |
|---|---|---|---|---|
| 1. | Dr. Sourav Mallick | Single Phase Two-stage Grid Connected PV System | Renewable Energy | Divyansh Priyadarshi Sunny Kumar |
| 2. | Dr. Molay Roy | Wireless Charging System for Electric Vehicles | Power Electronics | Amit Kumar Prasad Farhan Hasan |
| | | Active Cell Balancing using Buck-Boost Converter (With Stateflow Control) | Power Electronics | Manu Avachi Prashant Gaurav |
| | | DevOps for System Integration, Development and Validation of Modem Driver | Industry Project Intern | Rohit Ranjan |
| 3. | Dr. Prasenjit Dey | Boost Converter Topology for PV System with Perturb and Observe MPPT Algorithm | Power Electronics | Sachin Kumar |
| | | Optimal Control Based Small Signal Stability Analysis of Power Systems Incorporating FACTs and Electric Vehicles. | Power Systems | Naveen Guguloth |
| | | Load Frequency Control of an Isolated Power System | Power Systems | Undinti Akhil Kumar |
| 4. | Dr. Pradeep Kumar | Power Quality Improvement by DSTATCOM | Power Electronics | Abhishekh Ranjan |
| | | Power Quality Improvement by DVR | Power Electronics | Shiv Kumar |
| | | Power Quality Study by Active Power Filter | Power Electronics | Pawan Kumar Prasad |
| | | Optimal Var Planning in power system using Meta-heuristic Algorithms | Power System | Shankar Kumar |
| 5. | Jogi Paul | Study of Maximum PowerPoint tracking (MPPT) Techniques in Solar Photovoltaic Array | Renewable Energy | Yashraj Singh, Arpit Singh |
| | | Charging of Li-ion battery using Regenerative braking | Electric Vehicle | Sushmita Paul, Abhinav Sahay |

| Sl. No. | Name of the Supervisor | Project Title | Project Area | Name of the Student |
|---|---|---|---|---|
| 6. | Dr. Anulekha Saha | Rate of change of frequency based islanding detection technique in Microgrids, | Power Systems | Pradeep Gadaily |
| | | Voltage ripple based islanding detection technique in Microgrids, | Power Systems | Vishal Kumar Rajak |
| | | Rate of change of phase angle deviation based islanding detection technique in Microgrids | Power Systems | Muklesh Meena |
| 7. | Dr. Aurobinda Panda | Z-Source Inverter Based Single Stage PVDG System | Power Electronics | Muddala Satya Kumar, Dilbagh Singh |
| | | Enhanced Power Quality Based PVDG System using Model Predictive Control | Power Electronics | Saket Suman, Shivam Kumar Jha |
| 8. | Dr. Anjan Kumar Ray | SOC determination using a combined state space model with adaptive neural compensator | Control Systems | Shrey Raj, Abhishek Kumar |
| | | Visual scene understanding using deep learning | Control Systems | Himanshu |
| | | Path planning of mobile robot using adaptive particle swarm optimization | Robotics | Akash Kumar |
| 9. | Dr Amit Kumar Yadav | Neural Network Estimation of Microgrid Maximum Solar Power | Renewable Energy | Damini Singh, Mamta Kumari |
| | | Preliminary assessment of wind power potential at different heights | Renewable Energy | Beta Saicharan |
| 10. | Dr. Abhishek Rajan | Solution of Economic dispatch problem using meta-heuristic algorithm | Power Systems | Rahul Kumar, Surya Narayan Sahoo, Rakesh Kumar |
| | | Optimal VAR Planning in power system using Meta-heuristic Algorithms | Power Systems | Uttam Chettri |
| 11. | Dr. Kuntal Mandal | Revo Data Manger: Version Upgrade from R9.4 to R11 | Industry | Surya Kant Mani |
| | | Bioenergy - A boon to the mankind | Renewable Energy | Subham Tiwari |
| | | Stability Analysis of Renewables Integrated Electricity Grid | Control Systems | Kartikeya Saraswat |
| | | Modeling and Simulation of Hydro Power Turbine | Power Electronics | Suraj Kumar Giri |

## Project of Final Year PG Students

| Sl. No. | Name of the Supervisor | Project Title | Project Area | Name of the Student |
|---|---|---|---|---|
| 1. | Dr. Kuntal Mandal Dr. Aurobinda Panda | Performance Evaluation of Electric Vehicles using Dynamic Model | Electric Vehicle | Ayush Chauhan |

# Department of Mechanical Engineering

*"Manufacturing is more than just putting parts together. It's coming up with ideas, testing principles and perfecting the engineering as well as final assembly."*

**James Dyson**

Mechanical Engineering is concerned with the responsible development of products, processes, and power, at scales ranging from molecules to large and complex systems. Many innovations crucial to our future will have their roots in the world of mass, motion, forces, and energy—the world of Mechanical Engineers. The Department of Mechanical Engineering endeavors to be recognized globally for outstanding education and research leading to well qualified, innovative, entrepreneurial and successful engineers to cater the ever-changing industrial demands and social needs. The Department aims to conduct innovative research and to provide world-class education that instills the professional, technical, critical-thinking and communication skills necessary to make impactful contributions to the society.

The Department started its journey in 2014. Since its inception, the Department has produced globally competent Mechanical Engineers capable of contributing the society through innovation and working in multidisciplinary fields. The Department aims to provide the students with the perfect blend of intellectual and practical experiences that help them to serve our society and address a variety of needs of human beings.

Primary goals of the Department are as follows:

- To maintain a high standard of education through outstanding teaching, innovative curricula, and research training that reflect the changing needs of the society.
- To attract highly motivated students with enthusiasm, aptitude and interest in Mechanical Engineering.
- To pursue excellence in Research and Technology Transfer.
- To recruit and retain the Faculty members in the Department.
- To increase the public awareness of Departmental activities and the Mechanical Engineering profession.
- To provide the latest knowledge and research as well as the opportunity to consult and share best practices.
- To update with an understanding of modern Mechanical Engineering field like Artificial Intelligence, Computer-aided Design (CAD), Computer-aided Manufacturing (CAM), Product Life Cycle Management to design and analyze manufacturing plants, industrial equipment and machinery.
- To cater the modern knowledge of heating and cooling systems, transport system, aircraft, robotics, medical devices, weapons etc.
- To conduct multi-disciplinary and collaborative research works with various industries and academic institutes.

## Programs / Courses Offered

- B. Tech in Mechanical Engineering
- Ph. D in Mechanical Engineering

## Students Strength (B. Tech.)

| | Sanctioned Intake | Number of Students (2020-21) |
|---|---|---|
| 1st Year | 30 | 30 |
| 2nd Year | 30 | 20 |
| 3rd Year | 30 | 27 |
| 4th Year | 30 | 30 |

# Faculty Details

Members of the Department value professionalism and integrity, teaching excellence as well as students' initiative and innovation. Departmental Faculty members hold these values as an integral frame of reference to realize the decisions and actions at every level and in every situation.

- **Dr. Shambhunath Barman**
  Assistant Professor and HOD
  Ph.D. (Jadavpur University, 2014), M.E. (BESU Shibpur, 2008)
  **Area of Interest:** Experimental and Numerical Heat Transfer and CFD.

- **Dr. Ranjan Basak**
  Assistant Professor
  Ph.D. (Jadavpur University, 2012), M.M.E. (Jadavpur University, 2000)
  **Area of Interest:** Fluid Mechanics and Machine Design.

# Temporary Faculty Members

**Dr. Debajit Saha**

**Mr. Susanta Kumar Pradhan**

**Mr. Pratik Kumar Shaw**

**Mr. Manohar Kumar**

**Dr. Pradip Mondal**

**Dr. Bibhuti Bhusan Nayak**

**Dr. Kirti Tewari**

**Dr. Shitendu Some**

**Dr. Dipayan Das**

**Mr. Ayan Pramanick**

# Staff Details

**Mr. Amit Maity**
Lab Technician
ITI, Diploma (Mechanical)

## Membership of Technical Association / Society

- Mr. Susanta Kumar Pradhan: Member of ISTE
- Dr. Pradip Mondal: Member of IAASSE

## Laboratory Facilities

Since its inception, the Department is emphasizing to establish state-of-the-art as well as modern Laboratories to cater to the societal needs. The Department is now well equipped with the following Laboratories:

- Mechanical Workshop
- Fluid Mechanics and Machinery Laboratory
- Elements of Solid Mechanics Laboratory
- Production Engineering Laboratory I
- Production Engineering Laboratory II
- Computer Graphics Laboratory

- CAD / CAM Laboratory
- Machine Drawing Laboratory
- Metrology and Instrumentation Laboratory
- Heat Transfer Laboratory
- IC Engine Laboratory
- Refrigeration and Air-Conditioning Laboratory
- Energy Conversion Laboratory
- Kinematics and Dynamics of Machinery Laboratory
- Metal Cutting Laboratory
- Vibration & Rotor Dynamics Laboratory

## 1. Mechanical Workshop

The main objective of this course is to develop a machining skill in dignity of labor, precision, and safety at workplace, teamwork and development of right attitude. This course also enhances the skill of measurements and improves the skills in basic engineering practices with hand tools and instruments which are commonly used in the basic workshop practice.

*Pictorial View of Mechanical Workshop*

## 2. Fluid Mechanics and Machinery Laboratory

The purpose of this Laboratory is to reinforce and enhance your understanding of the fundamentals of Fluid Mechanics and Hydraulic Machines. The experiments here are designed to demonstrate the applications of the basic Fluid Mechanics principles and to provide a more intuitive and physical understanding of the theory. The prime objective of this Laboratory is to discuss and practice standard measurement techniques of Fluid Mechanics and their applications. It also includes the performance of various apparatus at different operating points. After completion of this Laboratory class, the students will able to understand the concept of Fluid Machinery such as different types of turbines and pumps and various non-dimensional parameters applicable to hydraulic machines. The students will able to verify Bernoulli's Theorem and calibrate venturi-meter, Orifice meter, Nozzle, Pitot tube etc. The students will able to characterize laminar, Turbulent flows and analyze the stability of floating bodies at the end of this Laboratory class.

Pictorial views of some of the instruments are depicted below:

*Bernoulli's Principle Demonstrator*

*Turbines (Pelton and Francis) Test-Rig*

## 3. Elements of Solid Mechanics Laboratory

The objective of this Laboratory is to teach students about the evaluation of different mechanical properties of metals viz. a) Limit of proportionality b) Elastic limit c) Yield strength d) Ultimate strength e) Young's modulus of elasticity f) Percentage elongation g) Percentage reduction etc. Furthermore, Torsion test, Hardness Test, Izod & Charpy test, Compressive strength tests are also conducted under the Laboratory. Pictorial views of some of the instruments are shown below:

*Universal Testing Machine*

*Hardness Testing Machine*


*Torsion Testing Machine*

*Spring Testing Machine*

## Computer Graphics Laboratory

The objective of this Laboratory is to teach students about the basics of AUTOCAD, 2D modeling and isometric drawings of different mechanical parts. 3D modeling of different types of mechanical components is carried out in this Laboratory.

*Computer Graphics Laboratory*

## 5. Production Engineering Laboratory I

The objective of this course is to understand the working of machine tools such as lathe, shaper, planner, slotter, milling, hobbing, and grinding and to familiarize with the selection of suitable production process for the manufacturing of desired component. This course also reveals the basic concepts of NC and CNC machine tool programming and computer aided part programming. Pictorial views of the some of the instruments are shown below:


*Precision Conventional Lathe*

*Shaping Machine*

*CNC Lathe*

## 6. Production Engineering Laboratory II

The objective of this course is to understand the cutting forces, average cutting temperature in machining processes under different feed and speeds. The course is delineated particularly to understand chip formation mechanism and relevant matters (type, colour & thickness) during different machining processes and evaluate the role of variation of cutting speed and feed on chip reduction coefficient / cutting ratio and shear angle. Pictorial views of the some of the instruments are shown below:

*Horizontal Surface Grinder*

*Horizontal Surface Grinder*

*TIG Welding set-up*

*MIG Welding set-up*

## 7. CAD / CAM Laboratory

CAD / CAM Laboratory of the institute introduces various types of design software which are very useful for design various types of machine component. This Laboratory provides the basic concepts of CAD. In this Laboratory, students can develop 2D Model and 3D Model on CAD Software (Solid Works), various 3D Models using basic Boolean Operations: shell, sweep, revolve, loft, extrude, filleting, chamfer, splines etc. To impart knowledge on manual part programming for CNC Lathe and NC Milling are the major objectives of this laboratory.

*Pictorial view of CAD / CAM Laboratory*

## 8. Machine Drawing Laboratory

The objective of this Laboratory is to teach students about the rrepresentation of elements of machine drawing, introduction to Engineering Materials, Surface finishes, tolerances, sectional views, and screw threads. Component drawings of bolts and nuts, locking devices, keys and cotter joints, knuckle joint, riveted joints, shaft couplings, bearings and pipe joints are also taught to the students. Furthermore, assembly drawing practice and drawing of the assembly of stuffing box, pedestal bearing using the component drawings are being practiced by the students in this Laboratory.

*Pictorial view of Machine Drawing Laboratory*

## 9. Metrology and Instrumentation Laboratory

The objectives of Mechanical Measurements & Metrology Lab are to demonstrate the theoretical concepts taught in Mechanical Measurements & Metrology and also to understand the use of various measuring tools with calibration. Thread profile measurement, usage of autocollimator, profile projector, surface roughness tester, thermal imaging device are being taught to the students. Pictorial views of some of the instruments are shown below:

*Optical Bevel Protractor*

*Portable Surface Roughness*

*Sine Bar*

*Slip Gauge*

*Vernier Height Gauge*

*Thermal Imaging Camera*

## 10. Heat Transfer Laboratory

Heat Transfer Laboratory of the Institute is well equipped with modern instruments to strengthen the knowledge of students in this particular domain. Instruments of this Laboratory are procured under the aegis of TEQIP-III of the Institute. This Laboratory is aimed to equip the students with proper knowledge on the Conductive, Convective and Radiative Heat Transfer. To impart ideas on heat exchangers, different temperature measurement modules etc are the broad objectives of this Laboratory. Pictorial views of some of the instruments are shown below:

*Boiling and Condensation Apparatus*

*Calibration of Thermo-couple Apparatus*

*Radiation Apparatus with Radiation Shield Arrangement*

## 11. IC Engine Laboratory

Internal Combustion Engine Laboratory is well equipped with numerous instruments to enhance knowledge of the students and the instruments are bought with full financial support of TEQIP-III of the Institute. In this Laboratory, cut-sections models of different engines along with VTD plotting are presented to the students. Performance measurement test on single cylinder diesel, petrol engines, multi-cylinder engines are also being performed in this Laboratory.

Along with these above-mentioned test facilities, one multi fuel VCR engine with open ECU is there in this Laboratory for carrying out research activities. Performance, combustion testing can be conducted with available instruments using different alternative fuels. This Laboratory is also well equipped with Multi-gas Analyser to check the emission characteristics of the engine. Pictorial views of some of the instruments are depicted below:

*Bomb Calorimete*

*Cut section Models of Engines and Boilers*

*The Engines*


*Multi-gas Analyser*

## 12. Refrigeration and Air-conditioning Laboratory

Refrigeration & Air-conditioning Laboratory consist of several instruments to provide hands-on knowledge on the subject. Recently in this Laboratory, instruments related to refrigeration experiments were bought with the financial aid of TEQIP-III of the Institute. Cut-section Models of different type compressors, domestic refrigerator are shown to the students to impart ideas about different components as well as on their working. Determination of COP of domestic type refrigerator, small ice plant (computerized), VAR system are taught to the stu dents. Experimentation on refrigerant leak detection is carried out in this Laboratory. Furthermore, the Laboratory is newly equipped with AC Test Rig, Thermo-electric refrigerator, different type of compressor models etc. Pictorial views of some of the instruments are depicted below:

*VCR Test Rig (domestic refrigerator) -Manual Mode*

*VAR Test Rig*

*AC Test Rig*

## 13. Energy Conversion Laboratory

Energy Conversion Laboratory of the Institute is well equipped with many state-of-the-art facilities to acquire knowledge about different types of basic energy conversion processes. Cut-section Models of different type of boilers are presented to the students in this Laboratory. Experimentation on Blower Test Rigs is also carried out in this Laboratory. This Laboratory is about to be equipped with several other experimentations, very soon. Pictorial views of some of the instruments are depicted below:

*Cut-section Model of Stirling Boiler*

*Cut-section Model of Lancashire Boiler*

*Assembling and dismantling set-up of 4-S 4-C Petrol Engine (working)*

*Centrifugal Blower with data logging facility*

## 14. Kinematics and Dynamics of Machinery Laboratory

Objectives of Kinematics & Dynamics of Machinery Laboratory are to impart practical knowledge on design and analysis of mechanisms for the specified type of motion in a machine. With the study of rigid bodies, motions and forces for the transmission systems, machine kinematics and dynamics can be well understood. Various experiments with governors, gyroscopes, epicyclic gear train are available to understand machine dynamics. This Laboratory also provides hands-on knowledge on static and dynamic balancing of machine components. Pictorial views of some of the instruments are depicted below:

*Static and Dynamic Balancing Machine*

*Whirling of Shaft Apparatus*

*Gyroscope Apparatus*

*Epicyclic Gear Train Apparatus*

## 15. Metal Cutting Laboratory

This course introduces specialized knowledge and skills in machining processes using the principles and methods of Engineering Analysis, Merchant's theories of Machining. This Laboratory is aimed at introducing the Know-how of common processes used in industries for manufacturing parts by removal of material in a controlled manner. Auxiliary devices as well as methods for machining to desired accuracy and quality will also be covered. The emphasis throughout the Laboratory course will be on understanding the basic features of the processes rather than details of constructions of machine, or common practices in manufacturing or acquiring skill in the operation of machines. Pictorial views of some of the instruments are depicted below:


*Radial Drill Machine*

*Universal Milling Machine*

## 16. Vibration & Rotor Dynamics Laboratory

Objectives of Vibration and Rotor Dynamics Laboratory are to impart practical knowledge on free and forced vibrations analysis for various types of mechanical component. This Laboratory demonstrates the experiments on damping, resonance and absorber effects in forced vibrations, determination of the oscillation period depending on torsion wire length, diameter and rotating mass. This Laboratory also provides hands-on knowledge on free and damped torsional vibrations. Various experiments with governors, elastic shafts, cam mechanisms are available to understand machine dynamics. Pictorial views of some of the instruments are depicted below:

*Free and Forced Vibration Apparatus (TM155)*

*Universal Vibration System (TM150)*

*CAM Mechanism*

## HPC and Software

- Undergraduate project works are being carried out through HPC platform as well as Institutional ANSYS software.
- Ph.D. Students and Faculty members of the Department are availing the HPC facility as well as ANSYS and open source software for conducting their research works.
- Online Integrative Learning / program tool is also being used by the Department for different laboratories, such as; Basic Workshop, Metrology and Measurement, Production Engineering to teach the students in a more effective way during the pandemic era.

## Conference / Special Lecture / Seminar / Workshop organized

- **A Curriculum Development Workshop** through online platform was organized by the Department regarding finalization of the syllabus of the **elective subjects** as well as the Laboratory courses of the Final Year (Seventh Semester) on **5th August 2020**. The Program was conducted via online mode in the august presence of **Prof. Mahesh Chandra Govil**, *Director NIT Sikkim;* **Prof. Dilip Sharma**, *MNIT Jaipur;* **Prof. Himanshu Chaudhary**, *MNIT Jaipur;* **Prof. Murari Lal Mittal**, *MNIT Jaipur.*


*Snap taken during the Program*

- The Department organized another **Curriculum Development Programme** on 6th February 2021 and 10th February 2021, respectively, in conjugative manner, regarding the finalization of the syllabus of the **elective subjects** of the Final Year (Eighth Semester). The Program was conducted via online mode in the august presence of **Prof. Achintya Mukhopadhyay**, *Jadavour University*; **Prof. Rajiv Kumar Garg**, *NIT Jalandhar*; **Prof. Sankha Deb**, *IIT Kharagpur* and **Prof. Himanshu** Chaudhary, *MNIT Jaipur.*

*Glimpses of the Program*

- The Department of Mechanical Engineering of NIT Sikkim had successfully organized a **Five day Online Workshop on Recent Trends in Thermo-Fluids (RTTF 21)** during **22nd -26th February 2021**. An overwhelming response in terms of active participation from across the country was received during the event. The workshop was conducted via online mode (G-Meet) and under the financial support of **TEQIP-III** of the Institute. The proposed Online Workshop was aimed at creating an effective forum for exchanges of innovative ideas and research works in the areas of Thermo-Fluids as well as their upcoming advancement. Eminent Speakers from the field of Academia and Industry delivered their lecturers on the thematic areas of the Workshop. The Program was inaugurated under the gracious presence of **Prof. Rajat Gupta**, Director NIT Mizoram as *Chief Guest* and **Prof. Mahesh Chandra Govil**, Director NIT Sikkim. Name and Topics of the prospective Speakers are listed below:

| Sl. No. | Name of the Speaker | Topic of Talk |
|---|---|---|
| 1 | **Prof. Suman Chakraborty**<br>IIT Kharagpur | Microfluidics for Medical Diagnostics |
| 2 | **Prof. Rajat Gupta**<br>NIT Mizoram | Recent Advances in Vertical Axis Wind Turbine- A Review |
| 3 | **Prof. Shailendra D Shamra**<br>IIT Bombay | Vortex Generator: Passive Flow Control Device with Active Role |
| 4 | **Dr. Sirshendu Mondal**<br>NIT Durgapur | Describing and Controlling Thermo-Acoustic Instability Through Synchronization Theory |
| 5 | **Dr. Pallab Sinha Mahapatra**<br>IIT Madras | Wettability Engineering and its Application in Thermo-Fluids |
| 6 | **Dr. Soumyadip Sett**<br>IIT Gandhinagar | Dropwise Condensation of Low Surface Tension Fluids on Nanostructured Liquid Infused Surfaces |
| 7 | **Prof. Amaresh Dalal**<br>IIT Guwahati | Development of a general Purpose CFD solver for Multiphysics applications |
| 8 | **Prof. Saptarshi Basu**<br>IISc Bangalore | Fluid Mechanics at Multiple Spatiotemporal Scales |
| 9 | **Prof. Bijan Kumar Mandal**<br>IIEST Shibpur | Simulation of Reacting Flows |
| 10 | **Prof. Swarnendu Sen**<br>Jadavpur University | Early Prediction of Instabilities in a Natural Circulation Loop |
| 11 | **Dr. Souvick Chatterjee**<br>MathWorks | Physical Modeling of Thermo-fluidic Systems for end-to-end Applications |

Glimpses of the Workshop are shown below:

- Five days Online Workshop on "Contemporary Issues in Design and Manufacturing (CIDM 21)" was successfully organized by the Department of Mechanical Engineering of National Institute of Technology Sikkim, under the sponsorship of TEQIP-III, Govt. of India during 15th to 19th March, 2021. The proposed Online Workshop was aimed at creating an effective forum for exchanges of innovative ideas and research works in the areas of Design and Manufacturing as well as their upcoming advancements. In this Inaugural Session of the Workshop, the presence of **Prof. Mahesh Chandra Govil**, honourable Director of NIT Sikkim; Chief Guest for the event, **Prof. Karunesh Kumar Shukla**, honourable Director of NIT Jamshedpur, made this occasion even more significant. More than 150 participants from across the country actively participated in the event. Name and Topics of the prospective Speakers are listed below:

| Sl. No. | Name of the Speaker | Topic of Talk |
|---|---|---|
| 1 | **Prof. Satish C. Sharma**<br>IIT Roorkee | Role of Biomimeticsin Tribological Design of Machine Elements |
| 2 | **Dr. Arijit Bhattacharya**<br>Norwich Business School | Circular Economy in Manufacturing Supply Chains and Product Design |
| 3 | **Prof. Himanshu Chaudhary**<br>MNIT Jaipur | Optima IDynamic Balancing of Multibody Systems |
| 4 | **Prof. Surjya Kanta Pal**<br>IIT Kharagpur | AI in Manufacturing |

| Sl. No. | Name of the Speaker | Topic of Talk |
|---|---|---|
| 5 | **Prof. Mohammad Farooq Wani**<br>NIT Srinagar | Life Cycle Modelling and Evaluation at Conceptual Design Stage (CDS) |
| 6 | **Prof. Santanu Das**<br>Kalyani Government Engineering College | Fundamentals and Few Advances of Arc Welding |
| 7 | **Prof. Rajiv Kumar Garg**<br>NIT Jalandhar | Lean Manufacturing: Need, Concept and Techniques |
| 8 | **Prof. Debasis Datta**<br>IIEST Shibpur | FEM as a general solver of field problems |
| 9 | **Dr. Prashanta Kr. Mahato**<br>ISM Dhanbad | Aeroelastic analysis of composite aircraft structure |
| 10 | **Prof. Goutam Sutradhar**<br>Director, NIT Manipur | I.T Enabled Manufacturing Technology: Perspective Industry 4.0 |
| 11 | **Dr. Joy Prakash Misra**<br>IIT BHU | Evaluation of Machining Process |
| 12 | **Prof. Amitava Ray**<br>Jalpaiguri Govt. Engineering College | Application of theory of constraints in the manufacturing process |

Glimpses of the Workshop are shown below:

- The Department, in collaboration with the Department of Electrical and Electronics Engineering, Department of Computer Science and Engineering had organized a Five day Online Workshop on **Fuzzy Logic Systems in Engineering Applications (FLSEA 21)** during 15th-19th March 2021, under the financial support of TEQIP-III. A total of 461 participants registered and participated in the event. The Program was inaugurated by **Prof. S P Gupta**, College of Engineering, Roorkee. Speaker list are as follows:
  - **Prof. N.P. Padhy**, *Department of Electrical Engineering, IIT Roorkee*
  - **Prof. Niladri Chatterjee**, *Department of Mathematics, IIT Delhi*
  - **Prof Shiv Prasad Yadav**, *Department of Mathematics, IIT Roorkee*
  - **Prof. Snehashish Chakraverty**, *Department of Mathematics, NIT Rourkela*
  - **Prof. Nirmal Baran Hui**, *Department of Mechanical Engineering, NIT Durgapur*
  - **Prof. Rajesh Kumar**, *Department of Electrical Engineering, MNIT Jaipur*
  - **Dr. Swagatam Das**, *Department of Electronics and Communication Sciences Unit, ISI Kolkata*
  - **Dr. Haider Banka**, *Department of Computer Science and Engineering, IIT (ISM) Dhanbad*
  - **Dr V Lakshmana Gomathi Nayagam**, *Department of Mathematics, NIT Trichy*

Glimpse of the Inaugural Event is shown below:

## Professional Practice

The Department is conducting Online Professional Practice classes, regularly in order to strengthen the soft skills of the students from Second Year onwards. This is substantially improving the performance of the students in placement as well as in competitive examinations.

## Involvement in Community Development

The students of near-by schools visited the Departmental Laboratories, Workshops to get exposure of Mechanical Engineering. Furthermore, Faculty members regularly visit neighboring / native places to interact with the local inhabitants.

Departmental Faculty members and Staffs participated in "SWACHH BHARAT ABHIYAN" and participated in the Community Development Program. Glimpses of Community Development Program since the past 2020-21 is shown beside:

## Projects at the Department

- **Analysis of atmospheric boundary layer using enhanced wall function and improved inlet condition**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India (***Rs. 2 lacs***).
- **Design and development of Solar–PV based winter air conditioning system for typical classrooms**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India (***Rs. 2 lacs***).

## Details of Ph.D. Scholars

| Name of the Student | Thesis Title / Research area | Supervisor (s) | Status |
|---|---|---|---|
| Mr. Lakshman R | Simulation of Atmospheric Boundary Layer | Dr. Ranjan Basak | Pursuing |
| Mr. Anwesh Virkunwar | Material Characterization | Dr. Ranjan Basak<br>Dr. Shouvik Ghosh (JU, Kolkata) | Pursuing |
| Mr. Prasan Dewan | Non-traditional Machining (EDM) | Dr. Pranab Kumar Kundu<br>Dr. Ranjan Basak | Pursuing |
| Mr. Saddam Hossain Mullick | Natural Convection in Enclosure | Dr. Pranab Kumar Kundu<br>Dr. Ranjan Basak<br>Dr. Debabrata Dasgupta (IIT Delhi) | Pursuing |
| Mr. Aditya Kumar Singh | Thermo-Fluid | Dr. Shambhunath Barman | Pursuing |

## Undergraduate Students Internship Details

| Name of Student | Details |
|---|---|
| Manita Thatal Darjee | Creating a 'WOW' customer experience / Schindler India Pvt Ltd / Sales (Existing Installation) |
| K. Prem Swaroop | Indian Railway (S.E. Railway Workshop, Kharagpur) - LHB Bogie |
| Aditya Raj | SRP and PCP used in the extraction of Coal Bed Methane - ONGC Bokaro |
| Poloju Srinath | Winter Intern at Vizag Steel Plant in the Dept of MMSM |
| Vivek Kumar | LHB Bogie - South Eastern Railway Workshop Kharagpur, W.B. |
| Satyam Kumar | Vocational Training at MTPS |

| Name of Student | Details |
|---|---|
| Narottam | Monitor and Implement Entrapment Reduction Plan / Schindler India / Existing Installations |
| Munna Kumar | Intern at Vizag Steel Plant in Medium Merchant & Structural Mill (MMSM) Dept. |
| Atif Khan | Design of Tool to Check Alignment and Perpendicularity of Roof Rail Studs of MARUTI VITARA BREEZA |
| Dhiraj Kumar Singh | GO-Kart Designing / Baba automobile workshop, Jaipur Rajasthan |
| Sudeep Prasad Rajak | IC-Engine Design from Verzeo |
| Surya Daya Sharma | Virtual Industrial Training By Sky Y Rider, BOSCH |
| Ritwik A George | LHB Bogie - Railway Workshop Kharagpur, W.B. |
| Sumit Kumar Somu | DIESEL LOCOMOTIVE BOGIES- Workshop in RDSO |
| Kundan Kumar Mandal | Winter int. Bhilai Steel Plant (SAIL) in Depth of MMSM in Rolling Mill |
| Swapnil Verma | Worked at BABA Automobiles on Go-kart Designing and Manufacturing Project |
| Ayaan Ali | EI Sales -/ Schindler India Pvt ltd |
| Manish Kumar | Piezoelectricity Induced Electromagnetic Radiation for Deformation Monitoring at IIT Mandi |
| Ankit Jaiswal | Check the Strength Calculation of Primary Traction Rod used in WAG9 Loco BOGIE / RDSO Lucknow |
| Puli Srujan | Internship at Vizag Steel Plant in Depth of MMSM in Rolling Mills |
| Manish Kumar | Summer internship at RDSO |
| Rajan Kumar | Creating a WOW Customer Experience / Schindler India Pvt Ltd / Sales (Existing Installation) |
| Rajan Kumar Sinha | Vocational Training at Mejia Thermal Power Plant |
| Samay Singh Meena | Worked in GO-Kart Team Project, Baba Automobile |
| Abhay Kumar | Vizag Steel Plant |
| Satyam Adarsh Choudhary | Intern at Vizag Steel Plant in Medium Merchant & Structural Mill (MMSM) Dept. |
| Arupratan Gupta | Online Internship at Entuple and Pantech Regarding Matlab and ANSYS |
| Tardup Lepcha | Virtual Industrial Training By Sky Y Rider, BOSCH |
| Sonu Kumar Shah | Automotive Design and Manufacturing / Soha Technology Pvt Ltd |

## Projects of Final Year Students

| Name of the Student | Project Title |
|---|---|
| Sudeep Prasad Rajak | Optimization of Contraction and Diffuser Wall Profile of Low Speed Wind Tunnel |
| Kundan Kumar Mandal | |
| Puli Srujan | |
| Arupratan Gupta | Heat Transfer Analysis during the Incineration of Plastics |
| Aditya Raj | Preliminary Design of an Axial Flow Turbine and a Centrifugal Compressor for a Turbocharger |
| Satyam Kumar | |
| Surya Daya Sharma | CFD Modeling of Solar Air-heaters |
| Swapnil Verma | Computational Analysis of Heat Transfer in Engine Cylinders with Fins |
| Tardup Lepcha | Computational Study of Tandem Solar Cells |
| Manish Kumar | Performance and Emission Characteristics Optimization of a VCR Engine Fuelled via Diesel/Bio-Diesel Blends through RSM |
| Rajan Kumar | |
| Manish Kumar | Enviro-economic Analysis of Non Metallic Domestic Solar Water Heating Systems |
| Poloju Srinath | |
| Abhay Kumar | |
| Ayaan Ali | Optimization of Machining Parameters in CNC Drilling of Inconel-718 |
| Ritwik A George | Optimization of Machining Parameters during Milling of Ti6Al4V in Vertical Machining Center |
| K. Prem Swaroop | Parameter Optimization in Metal Additive Manufacturing using MIG Cladding |
| Rajan Kumar Sinha | Mathematical Modelling of Parameters Used in Additive Manufacturing with Cladding Using Artificial Neural Network |
| Atif Khan | Optimization of CNC Milling Parameters for Cutting AISI D2 Steel |
| Narottam | Optimization of Machining Parameters in CNC Lathe of H13 Tool Steel |

| Name of the Student | Project Title |
|---|---|
| Munna Kumar | Study of Various Output Parameters in CNC Turning for Different Combinations of Tool Insert and Work Piece Materials |
| Samay Singh Meena | Optimization of Process Parameters in CNC Milling of Al7075 by Carbide Tools |
| Ankit Jaiswal | Considerations of Anthropometrics in Farm Tool Design for North Indian Farmers |
| Sumit kumar somu | Work-related Musculoskeletal Disorders among Mine Workers |
| Dhiraj Kumar Singh | Development of a Virtual Interface for Health Assistance for Differently-abled People |
| Sonu Kumar Shah | Optimization of the Power Supply in Stun Gun |
| Vivek Kumar | Design and Analysis of Tuned Vibration Absorber for Coupled System |
| Manita Thatal Darjee | Analysis and Design Fabrication of Dynamic Anti-Resonant Isolators |
| Satyam Adarsh Choudhary | Steady-state Analysis of Wide Tapered Land Slider |
| Bearing under Elastohydrodynamic Lubrication | |
| Binod Lamichaney | Theoretical Analysis of the Kinetics Energy Recovery System in Bicycle Using Flywheel |

## Undergraduate Students Achievements

- Mr. Ritwik A George (current Final Year Student) has been selected for perusing MS in Aerospace Engineering at Arizona State University.
- Manita Thatal Darjee and Rajan Kumar have been recruited in Schindler India Pvt. Ltd.
- Poloju Srinath, Manish Kumar, Rajan Kumar Sinha have been recruited in Infosys Ltd.
- Narottam has been recruited in Technoforte.
- Dhiraj Kumar Singh has been recruited in Saarthi.ai. (ppo).

## Student Events

The Department has organized several Online Student Programs during the pandemic period viz., Department level Induction Program, Cultural Program, National Science Day Celebration and more. National Science Day was celebrated Online (Google Meet) at the Mechanical Engineering Department, National Institute of Technology Sikkim on February 28, 2021 at 4:30 PM. The Program was initiated under the leadership of the Head of the Department, Dr. Shambhunath Barman with a motive to spread a message about the significance of scientific applications in the daily life of Mechanical Engineering students as well as to mark the discovery of the Raman Effect by Indian Physicist Sir C. V. Raman. Dean Academics, Dr. Ranjan Basak and Departmental Faculties graced the occasion. B.Tech students of second, third and fourth years alike participated actively in the event. This was followed by a Cultural Event. The programme included speech on Science Day, singing, recitation, story-telling, beat boxing and instrument-play. This event provided a platform to the students to demonstrate their talent and a stepping-stone to connect with each other in this pandemic time.

*Glimpses of the National Science Day Celebration & Cultural Event*

## Workshop / STC / FDP Attended by the Faculty Members

| Faculty Name | Name of the Programs attended like FDP, STC & Other Courses | Duration / Date |
|---|---|---|
| PM | NEP 2020:Towards Holistic Education (FDP) | 1st- 5th March 2021 |
| | Recent Trends in Thermo-Fluids (STC) | 22nd – 26th February 2021 |
| | Effective Research Proposal Writing – Challenges, Strategies and Guidelines (FDP) | 9th – 13th March 2021 |
| KT | NEP 2020:Towards Holistic Education (FDP) | 1st- 5th March 2021 |
| | Recent Trends in Thermo-Fluids (STC) | 22nd – 26th February 2021 |
| | Aerospace Technology: Theory and Practice (STC) | 17th - 21st February 2021 |
| | Fuzzy Logic Systems in Engineering Applications (STC) | 15th -19th March 2021. |
| | Flownex Webinar - Thermodynamic Design, Modeling, Simulation, Analysis & Optimization | 10th June 2020. |
| | Research Structuring, Statistical Insights & Publication Strategies (STC) | 26th -27th September 2020. |
| | Examination Reforms Training Workshop Organized by: National Project Implementation Unit | 4th -7th December 2020 |
| | Sustainable Energy Technologies: Synthesis of Alternative Fuels, Characterization, And Molecular Simulations | 7th - 11th December 2020 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (STC) | 15th – 19th March 2021 |
| BBN | Renewable Energy for Sustainable Development: Opportunities and challenges | September 8-12, 2020 |
| | Outcome Based Engineering Education and Accreditation (OBEEA 2020) | September 21-23, 2020 |
| | FLOWNEX Simulation software-Thermodynamic design, simulation and optimization | September 22, 2020 |
| | Thermal Management in Electronic equipments | December 14-16, 2020 |
| | Design, Modeling & Simulation of Solar Thermal, Solar PV Systems using POLYSON | January 15, 2021 |
| | Biomicrofluidics | February 19-20, 2021 |
| | Aerospace Technology: Theory and Practice | Februay 17-21, 2021 |
| | Recent Trends in Thermo-Fluids (RTTF 21) | February 22-26, 2021 |
| | NEP 2020:Towards Holistic Education | March 01-05, 2021 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) | March 15-19, 2021 |
| SS | NEP 2020: Towards Holistic Education (FDP) | 1st - 5th March 2021 |
| | Recent Trends in Thermo-Fluids (STC) | 22nd – 26th February 2021 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (STC) | 15th – 19th March 2021 |
| | Aerospace Technology: Theory and Practice (STC) | 17th - 21st February 2021 |
| | Effective Research Proposal Writing – Challenges, Strategies and Guidelines (FDP) | 9th – 13th March 2021 |
| | Cyber Security(FDP) | 1st - 5th December 2020 |

| Faculty Name | Name of the Programs attended like FDP, STC & Other Courses | Duration / Date |
|---|---|---|
| DD | Effective Office Administration and Financial Management (STTP) | 24th August - 11th September 2020 |
| | Aerospace Technology: Theory and Practice (STC) | 17th - 21st February 2021 |
| | Recent Trends in Thermo-Fluids (RTTF 21) (Online Workshop) | 22nd – 26th February 2021 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (Online Workshop) | 15th – 19th March 2021 |
| SKP | Recent Trends in Thermo-Fluids (RTTF21) (STC) | 22nd – 26th February 2021 |
| | NEP 2020:Towards Holistic Education (FDP) | 1st- 5th March 2021 |
| | Effective Research Proposal Writing – Challenges, Strategies and Guidelines (FDP) | 9th – 13th March 2021 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (STC) | 15th – 19th March 2021 |
| MK | NEP 2020:Towards Holistic Education (FDP) | 1st- 5th March 2021 |
| | Recent Trends in Thermo-Fluids (STC) | 22nd – 26th February 2021 |
| | Research Structuring, Statistical Insights & Publication Strategies (STC) | 26th -27th September 2020. |
| | Examination Reforms Training Workshop Organized by: National Project Implementation Unit | 4th -7th December 2020 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (STC) | 15th – 19th March 2021 |
| PKS | Aerospace Technology: Theory and Practice(STC) | 17th - 21st February 2021 |
| | Strategies in Modern Pedagogy (FDP) | 16-20th February 2021 |
| | Cyber Security(FDP) | 1st - 5th December 2020 |
| DS | NEP 2020: Towards Holistic Education (FDP) | 1st - 5th March 2021 |
| | Recent Trends in Thermo-Fluids (STC) | 22nd – 26th February 2021 |
| | Contemporary Issues in Design and Manufacturing (CIDM 21) (STC) | 15th – 19th March 2021 |
| | Aerospace Technology: Theory and Practice (STC) | 17th - 21st February 2021 |
| | Thermodynamics using Flownex Simulation Software | 24th July, 2020 |
| | Examination Reforms Training Workshop Organized by: National Project Implementation Unit | 4th -7th December 2020 |
| | Strategies in Modern Pedagogy | 16-20th February 2021 |
| | Fundamentals and Applications of Computational Fluid Dynamics in Fluid-Thermal Systems | 13-17th March 2021 |
| | Pedagogies of online Teaching and Evaluation: Pre and Post Covid-19 | 7-11th December 2020 |

# Department of Civil Engineering

*The story of civilisation is, in a sense, the story of engineering – that long and arduous struggle to make the forces of nature work for man's good*

**Lyon Sprague DeCamp**

A country's development is intrinsically linked to its infrastructure, whose growth is fuelled by the collective acumen of its engineers. Innovative, sustainable technological innovations are key to the growth of an emerging economy like India which is on the cusp of witnessing a socio-economic revolution. With its burgeoning population and its ever increasing basic needs, it is imperative for the country to build a robust infrastructur-al framework capable of balancing and fulfilling the immediate as well as its long term goals of progress. In this context the field of Civil Engineering through its diverse do-mains like Structural Engineering, Surveying, Environmental Engineering, Earthquake Engineering, Geotechnical Engineering, Water Resources Engineering and Transportation Engineering will be an important stakeholder in shaping the future of this country.

Aligning itself with the requirements of the country NIT Sikkim established this depart-ment in the year 2013, offering B.Tech. and Ph.D. programs. The B.Tech. program has an intake of 30 students. Civil Engineers with a penchant for applying theoretical concepts in order to find constructive practical solutions with ease of implementation are highly sought after by various industrial sectors. The curriculum of the Civil Engineering De-partment is designed to produce good practicing engineers as well as inculcate an apti-tude for research in the students as it will help them flourish in various industrial as well as in research organizations. The department offers a wide range of electives with a spe-cial emphasis on sustainable and green technologies. The Department currently has five laboratories namely Surveying Laboratory, Material Testing Laboratory, Geotechnical En-gineering Laboratory, Environmental Engineering Laboratory and Structural Design La-boratory. The procurement process for setting up the Transportation Engineering Labora-tory, Software Analysis Laboratory and Water Resources Engineering Laboratory is un-der way. The Department is planning to offer M. Tech program in different fields of Civil Engineering soon. The Department is elated to share that our Alumnis are working in var-ious government and reputed private sectors. Along with that, significant numbers of students are also pursuing higher education in various fields of Civil Engineering. Faculty members of the Department are actively associated with the construction and mainte-nance activities of the NIT Sikkim campus. The Department also contributes in landscap-ing, gardening and environmental protection of the Institute campus at Ravangla, South Sikkim.

The Faculty members of the Department have adapted to the present pandemic scenario and offered online classes to the students during the financial year 2020-21. All course materials have been digitized and sent to the students through email. The Department has used high quality NPTEL and other MOOCs courses to aid in the teaching-learning process. The Department understands that although there has been a huge improvement in the internet connectivity facilities during recent years, some students residing in remote areas face acute connectivity issues. In order to alleviate their problems, every online class has been recorded and sent across to them over email. The evaluation procedure was also completed online along with the help of using telephone, ensuring ample opportunity even to the most disadvantaged student. The laboratory classes were also conducted using the Ministry of Education's Virtual Laboratories which are available online.

# Course Offered

- B. Tech. in Civil Engineering

# Faculty Details

- **Mr. Neelanjan Dutta**
- **Dr. Sangita Deb Barman**
- **Mr. Debashish Roy**
- **Mr. Sumit Kumar**
- **Dr. Kushal Ghosh**
- **Dr. Dooradarshi Chatterjee**
- **Dr. Souvik Patra**
- **Mr. Rahul Biswas**
- **Mr. Bikram Paul**

# Staff Details

**Mr. Subho Das**
Technical Assistant

**Ms. Chanda Moktan**
Laboratory Technician

## Membership of Technical Association / Society

| Sl. No. | Technical Societies | Type of Membership | Name of Faculty |
|---|---|---|---|
| 1 | Institute of Public Health Engineering (Membership No. AM-786) | Associate Member | Mr. Neelanjan Dutta |
| 2 | International Association of Hydrological Sciences (IAHS Membership No. 16519) | Life Member | Dr. Sangita Deb Barman |
| 3 | Indian Concrete Institute | Life Member | Dr. Kushal Ghosh |
| 4 | The Institution of Engineers (India) | Associate Member & Chartered Engineer | Mr. Sumit Kumar |
| 5 | Indian Geotechnical Society, IGS Member Code: LM4497 | Life Member | Dr. Souvik Patra |
| | Associated with Deep Foundations Institute (DFI) of India | | |

## Laboratory Facilities

| Sl. No. | Name of Laboratory | Faculty In-Charge |
|---|---|---|
| 1 | Material Testing Laboratory | Dr. Kushal Ghosh |
| 2 | Surveying Laboratory | Mr. Bikram Paul |
| 3 | Environmental Engineering Laboratory | Mr. Neelanjan Dutta |
| 4 | Geotechnical Engineering Laboratory | Dr. Souvik Patra |
| 5 | Structural Engineering Laboratory | Mr. Rahul Biswas |

## 1. Surveying Laboratory

Surveying is the means of determining the relative position of points and the relative distance. It is an integral part of Civil Engineering education and training. Surveying of an area is essential for the design of all Civil Engineering projects such as highways, bridges, railways, water supply, sewage disposal, reservoirs and dams, building constructions, transmission tower, irrigation canal etc. The objectives of surveying may vary depending upon the type of projects and requirements. The economic feasibility of the Engineering Projects cannot be properly ascertained without undertaking a survey work. The objective of surveying laboratory is to make students familiar and competent enough to draw map

in suitable scale by using different surveying instruments like total station, theodolite, auto level, global positioning system (GPS), plane table, compass, etc. Students learn to survey from the conventional as well as contemporary methods and technology. The Surveying Laboratory provides students with hands-on experience of using sophisticated surveying equipment which will attune them to the technologies currently being used in the industry. In addition to standard minor equipment, the following major equipment is available in the laboratory:

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 1 | Dumpy level, Auto level | Finding out the elevations of given points with respect to a given datum. |
| 2 | Transit Theodolite, Digital Theodolite | Measurement of horizontal angle by method of repetition and reiteration and by establishing control points, their position being determined by measuring the distance between the traverse stations and the angles subtended at the various stations by their adjacent stations. |
| 3 | Total Station | The instrument can be used to measure horizontal and vertical angles as well as sloping distance of object to the instrument. |
| 4 | GPS | GPS is rapidly adapted for surveying, as it can give a position (Latitude, Longitude and Height) directly, without the need to measure angles and distance between intermediate points. |

*Auto Level*

*Transit Theodolite*

*Total Station*

## 2. Material Testing Laboratory

The Material Testing Laboratory introduces students to the various characteristics of construction materials and helps them understand the short term as well as long term mechanical and durability characteristics. Importance is also given to non-destructive tests to ensure the durability of built up structures. Emphasis is also given on the concept of sustainability and the impact of materials with respect to it. The laboratory course is designed with the aim of acquainting the students with the prevalent testing standards of the construction industry as well as introducing them to the enormous possibilities related to the field of material science. In addition to standard minor equipment, the following major equipment is available in the laboratory:

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 1 | Aggregate Impact Tester | Determination of Aggregate Impact Value (AIV) of aggregates which provides a relative measure of the resistance of an aggregate to sudden shock or impact. |
| 2 | Air Permeability Apparatus | Determination of fineness of Portland Cement by measuring the specific surface area of fine materials in square centimetres per gram of test sample. |
| 3 | Concrete Mixer (Motorised) | It is used for mixing cement, aggregate and water in order to manufacture concrete. |
| 4 | Compaction Factor Apparatus | Determines the compaction factor of concrete with low, medium and high workability. |
| 5 | Vee Bee Consistometer | Determination of workability of the freshly mixed concrete. The Vee-Bee test gives an indication about the mobility and the compatibility aspect of the freshly mixed concrete. |
| 6 | Rebound Hammer | It is a non-destructive method for determining the compressive strength of concrete. |
| 7 | Ultra-Sonic Pulse Velocity Testing Machine | Performs an in-situ, non-destructive test to check the quality of concrete Here, the quality of concrete is assessed by measuring the velocity of an ultrasonic pulse passing through the concerned concrete sample. |
| 8 | Digital Compression Testing Machine | Determination of compressive strength of cube and cylinder (i.e. hardened concrete). |
| 9 | Flow Table Apparatus | It is used primarily for assessing concrete that is too fluid (workable) to be measured using the slump test. |

*Hot Air Oven*

*Compression Testing Machine*

## 3. Geotechnical Engineering Laboratory

The Geotechnical Engineering Laboratory is a space for Undergraduate students to learn the fundamentals about soil mechanics, standard soil testing and build a foundation for further understanding. The Laboratory also provides state-of-the-art facility for excellent research to the students. The laboratory is well equipped with facilities for research on the characterization of granular materials, expansive soils, shallow foundations and ground improvement techniques. In addition to standard minor equipment, the following major equipment is available in the laboratory:

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 1 | Soil Hydrometer and Sieve | Determination of particle size distribution of soil. |
| 2 | Permeability Apparatus | Determination of permeability by direct laboratory method. |
| 3 | Consolidation Apparatus | Determination of the settlements due to primary consolidation of soil by conducting one dimensional oedometer test. |
| 4 | California Bearing Ratio Test Apparatus | Evaluation of the subgrade strength for roads and pavements by conducting the penetration test using 50mm dia plunger. |
| 5 | Direct Shear Apparatus, Motorised 12 speeds with data acquisition system | Measurement of the shear strength properties of soil or rock material, or of discontinuities in soil or rock masses. |
| 6 | Triaxial Shear Test Apparatus with data acquisition system | Determination of stress-strain characteristics of soil and shear strength of soil i.e. Cohesion (c) and Angle of Internal Friction ($\phi$) required for design of slopes, calculation of bearing capacity of any strata, and in many other analyses. |
| 7 | Laboratory Vane Shear Test Apparatus, motorised | Measurement of shear strength of cohesive soils, is useful for soils of low shear strength of less than about 0.5 kgf/cm2. This test gives the undrained strength of the soil, in undisturbed as well as remolded conditions both. |
| 8 | Universal Soil Sample Extruder(Electronic cum Hand Operated) | It is widely used for extracting specimen of soil, asphalt and concrete. |
| 9 | Unconfined Compression Testing Machine - (Motorised) | Estimation of unconfined compressive strength cohesive soil. |
| 10 | Relative Density Apparatus | Determination of the relative density of coarse grained soil |
| 11 | Swelling Pressure Test Apparatus (with Proving Ring and Dial Gauge) | Estimation of swelling pressure of expansive soils by Constant Volume Method. |
| 12 | Standard Penetration Test Apparatus | Determination SPT value (N) of soils (especially for granular soils) |

*Tri-axial Shear Testing Machine*

*Direct Shear Apparatus*

## 4. Environmental Engineering Laboratory

The purpose of the Environmental Engineering Laboratory is to make the students aware of the dangerous effects of environmental pollution that happen from water and air. The instruments like pH meter, TDS meter, DO meter, UV Spectrophotometer, BOD incubator, COD measuring instruments, water bath, autoclave, microbial analysis assembly, arsenic tester machine, electrodes for fluoride, nitrate and ammonia, titration test kit, shaker, filtration assembly and jar test apparatus help the students to understand the fundamental concepts of Environmental Engineering. The Laboratory also comprises cutting-edge research equipment such as the dual-beam UV Spectrophotometer which is used for quantitative determination of different analytics such as metal ions, highly conjugated organic compound and biological macro molecules. In addition to standard minor equipment, the following major equipment is available in the laboratory:

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 1 | TDS meter | To determine the total dissolved solids of a given water sample. |
| 2 | UV-Spectrophotometer | It is used for the quantitative determination of different analytics such as metal ions, highly conjugated organic compound and biological macro molecules. |
| 3 | Microprocessor Dissolved Oxygen Meter | To determine the oxygen present in a given water sample. |
| 4 | Electrodes fornitrate, fluoride and ammonium ion concentration test | It is used to measure nitrate, fluoride and ammonium ion concentration of water sample. |
| 5 | Incubator | Very important equipment to determine BOD of given water sample. It has also versatile application in different environmental analysis. |
| 6 | Microbiological analysis assembly | To determine the total coliform bacteria present in water. |

*UV- Spectrophotometer*

*Microbiological Analysis Assembly*

## 5. Structural Engineering Laboratory

The Structural Engineering Laboratory through instruments such as Bulking Behaviour of Bars, Line of Influence on the Gerber Beam, Three Hinged Arch, Parabolic Arch, Beam on two support Shear Force & Bending Moment and Single Plane Trusses enable the students to visualise, appreciate and validate the fundamental concepts of structural analysis and design.

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 1 | Buckling Behaviour of Bars | It is used to observe the effects of different factors like material specification, effective length on the buckling behaviour of bars. |

| Sl. No. | Name of the Equipment | Experiments performed |
|---|---|---|
| 2 | Line of Influence on the Gerber Beam | It is used to observe the effect of the moving loads on the internal reactions of a Gerber Beam. |
| 3 | Three Hinged Arch | It is used to observe the effects of static and moving load on the support reactions of a three hinged arch. |
| 4 | Parabolic Arch | It is used to observe the effects of static and moving load on the support reactions of a parabolic arch. |
| 5 | Beam on two support Shear Force & Bending Moment | It is used to observe the effects of point loads on the bending moment and shear forces of a beam. |
| 6 | Single Plane Trusses | The objective of the experiment is to measure the bar forces in a single plane truss subjected to a single external force. |

*Line of Influence on the Gerber Beam*

*Three Hinged Arch*

*Buckling Behaviour of Bars*

*Single Plane Trusses*

*Beam on two support Shear Force & Bending Moment*

Apart from the Academic Curriculum, the Department has also organised short term courses and workshops for the students through Virtual mode during the pandemic of Covid-19.

Recent Workshops organised by the Department are listed below:

## Keynote Speaker / Expert Lectures

To enhance the technical skill and awareness of the students on the recent developments in the field of Civil Engineering, the Department organized the following workshops:

| Name of the Workshop | Date |
|---|---|
| Recent Trend on Technologies in Environmental and Water Resources Management | 22nd – 26th February, 2021 |
| Recent Advances in Infrastructure Technology | 2nd to 6th March, 2021 |

## List of Resource Persons

| | |
|---|---|
| Prof. Ananth Ramaswamy, IISc Bengaluru | Dr. Koushik Roy, IIT Patna |
| Prof. Amiya Kumar Samanta, NIT,Durgapur | Prof. Subrata Chakraborty, IIEST, Shibpur |
| Dr. Arnab Banerjee, IIT Delhi | Dr. Romanbabu Oinam, IIT Tirupati |
| Prof. P K Goyal, DTU | Dr. Vaibhav Singhal, IIT Patna |
| Mr. Sumit Kumar, NIT Sikkim | Prof. Sreekanta Das, University of Windsor |
| Prof. Jyant Kumar, IISc Bengaluru | Dr. Krishanu Roy, University of Auckland |
| Dr. Mohana Shanmugam Sundaram, AIT, Thailand | Prof. Rakesh Kumar, Director, NEERI |
| Prof. Brajesh Kumar Dubey, IIT Kharagpur | Prof. Riddhi Singh, IIT Bombay |
| Prof. Deepak Kashyap, IIT Ropar | Prof. Pawan Kumar Labhasetwar |
| Prof. Anirban Gupta, IIEST Shibpur | Prof. Somnath Mukherjee, Jadavpur University |
| Prof. Biswajit Ruj, CSIR CMERI | Prof. Rutuja M. Chavan, MANIT Bhopal |

## Departmental Committees / Cells

| Sl. No. | Name of the Faculty Members | Name of the Committee / Cells |
|---|---|---|
| 1 | 1. Dr. Anindya Biswas, Convener<br>2. Dr. Sangita Deb Barman, Member<br>3. Mr. Neelanjan Dutta, Member<br>4. Mr. Debashish Roy, Member<br>5. Dr. Kushal Ghosh, Member<br>6. Dr. Souvik Patra, Member<br>7. Dr. SumitSaha, Member from allied department | Academic Performance Evaluation Committee (APEC) |
| 2 | 1. Dr. Sangita Deb Barman, Convener<br>2. Dr. Anindya Biswas, HOD (I/C)<br>3. Dr. Kushal Ghosh, Member<br>4. Mr. Neelanjan Dutta, Member | Departmental Undergraduate Committee (DUGC) |
| 3 | All the Faculty members of Department of Civil Engineering | Departmental Faculty Board (DFB) |
| 4 | 1. Mr. Rahul Biswas<br>2. Dr. Souvik Patra | Examination Cell |
| 5 | Mr. Rahul Biswas | Training and Placement Cell |

## Faculty Advisors of the Department

| Sl. No. | Year | Name of the Faculty Advisor |
|---|---|---|
| 1 | First Year | Dr. Kushal Ghosh |
| 2 | Second Year | Mr. Sumit Kumar |
| 3 | Third Year | Mr. Neelanjan Dutta |
| 4 | Fourth Year | Mr. Debashish Roy |

## Student Societies / Internship / Extra-Curricular Activities

### Student Society

The Department of Civil Engineering runs a non-profit organization "NIRMAAN". The members of the Society comprises of Undergraduate Students, Faculty Members and Alumni of the Civil Engineering Department. The Society works to help and facilitate the overall development of students pursuing Civil Engineering. NIRMAAN provides a platform to showcase and sharpen students' talents through a variety of events and activities planned throughout the year. The platform is also extended to the students of other departments, whenever possible.

## List of Final Year UG Projects

| Sl. No. | Supervisor | Title of Project | Students Name and Roll No. | Area |
|---|---|---|---|---|
| 1. | Mr. Neelanjan Dutta | Study of Kinetic Modelling of Activated Alumina as Adsorbent for Arsenic Removal from Contaminated Water | 1. Chandan Kumar (B170190CE)<br>2. Aditya Anand (B170148CE) | Environmental Engineering |
| | | An Optimization Study for Production of Liquid Fuel from High-density Polyethylene Waste through Pyrolysis | 3. Sonam Rajendra Yengade (B160038CE)<br>4. Juttukonda Arun (B170183CE) | |
| 2. | Dr. Dooradarshi Chatterjee | Stabilization of Slopes using Gabion Facing and Geogrid in Sikkim | 1. Laxana Thakur (B170163CE)<br>2. Ankita Chatterjee (B170175CE)<br>3. Pankaj Kumar (B170106CE) | Geotechnical Engineering |
| 3. | Dr. Souvik Patra | A Study on Stabilization of Subgrade Soil Using Plastic Waste Material | 1. Harish Kumar (B170057CE)<br>2. Rajesh Kushwah (B170127CE)<br>3. Abhishek Sagar (B170134CE) | Geotechnical Engineering |
| 4. | Dr. Kushal Ghosh | Effect of Structural Configuration on Behaviour of Tall Slender Structures Subjected to Lateral Loads | 1. Lokesh Soni (B170043CE)<br>2. Deepak Singh (B170146CE)<br>3. Sanjeet Marten (B170080CE) | Structural Engineering |
| 5. | Mr. Bikram Paul | Effect of infill walls and its opening on the seismic performance of buildings | 1. Animesh Kumar (B170110CE)<br>2. Kamal Kant (B170174CE)<br>3. Anushka Srivastava (B170039CE) | Structural Engineering |
| 6. | Mr. Sumit Kumar | Theoretical Validation of Design Results of a R.C.C Building Analysed by STAAD Pro. | 1. Sangay Delek Lepcha (B170031CE)<br>2. Nishi Kumari (B170105CE)<br>3. Manish Kumar Prasad (B170107CE)<br>4. Deepak Kumar (B170161CE) | Structural Engineering |
| 7. | Mr. Rahul Biswas | Prediction of compressive strength of fly ash concrete using machine learning techniques | 1. Durgesh Pratap Singh (B170085CE)<br>2. Sonu Kumar Bhagat (B170104CE)<br>3. Smriti Tamang (B170026CE)<br>4. Subham Kumar (B170131CE) | Concrete Technology |

| Sl. No. | Supervisor | Title of Project | Students Name and Roll No. | Area |
|---|---|---|---|---|
| 8. | Mr. Debashish Roy | Study of Effectiveness of Courbon's Theory in the Analysis of T-Beam Bridges | 1. Deepak Kumar (B170170CE)<br>2. Priya Sarkar (B170032CE)<br>3. Mukesh Kumar (B170180CE)<br>4. Indrajeet Kumar (B170166CE) | Highway Engineering |

# Department of Mathematics

> *Mathematics is the most beautiful and most powerful creation of the human spirit.*
>
> **Stefan Banach**

> *What is mathematics? It is only a systematic effort of solving puzzles posed by nature.*
>
> **Shakuntala Devi**

Mathematics has been an active ingredient in the world's scientific revolution, and India has played a vital role in this endeavour. Ancient India is famous for its mathematical geniuses and their revolutionary ideas. Aryabhata, Varahimihira, Brahmagupta, and Bhaskara II were the leading trailblazers of their times. From the era of Indus Valley Civilization to the Vedic period, India has pioneered 'practical mathematics', which consists of mathematical tools with a significant impact on real life.

Mathematics is an integral and fundamental part of Sciences, Engineering, and Technology disciplines. Thus, the Department of Mathematics has been an integral part of the Institute since its inception in 2010. Right from the beginning, the Department has been on a strenuous journey to provide students a platform for building their essential background of the subject. A solid foundation in the subject of Mathematics, enables students to tackle academic problems, real-life problems, and research problems. Overall a student with an excellent mathematical skill-set, in general, tends to make a better and well-informed decision. The Department actively participates in the teaching of Undergraduate (UG), Postgraduate (PG), and Ph.D students. The Department currently offers two compulsory courses for the UG students of all Engineering branches – namely Mathematics-I and Mathematics-II. It also offers two more compulsory courses, namely Mathematics–III (for the UG students of Mechanical and Civil Engineering) and Computation Mathematics (for the UG students of CSE, EEE, and ECE). For PG and Ph.D students, the Department offers several elective courses tailored according to their research and professional requirements.

Department also offers a Ph.D program in Numerical Linear Algebra, Operation Research, and Spectral Graph Theory. Numerical Linear Algebra is at the intersection of Linear Algebra and Numerical Methods, and it involves the study of matrix operations to generate efficient algorithms. Operations Research consists of analytical methods to make a better decision; thus, it is considered to be one of the most important subjects for practical purposes. Spectral Graph Theory studies the properties of graphs through the eigenvalues and eigenvectors of matrices associated with graphs. The Department is actively involved in collaboration with some of the best institutes in the country. For instance, one of our Faculty and Ph.D Student is currently working with Dr. G. P. Singh of from the Department of Mathematics, JNU, New Delhi.

The Department offers a compulsory course on professional practice for to all UG students to prepare them for their placements. This course is one of the essential practices for enhancing the careers of Undergraduate students. The main goal of Professional Practice is to strengthen aptitude, computational efficiency, and communication skills. To accomplish this goal, we conduct quantitative aptitude tests and reasoning tests frequently. Students can also perform very well in competitive exams like GATE with this kind of preparation.

## Vision

The vision of the Department is to become one of the best places to nurture mathematical skills in the North-East region of the country. The Department wishes to admit more Ph.D. students to pave the path for excellent research and

collaboration. As we advance, we will be keen on taking up projects based on Applied Mathematics and Statistics for the growth and benefit of the country and the state of Sikkim.

## Mission

The Department strives for excellence in the field of Mathematics for faculty members and students alike. Our Mission is to spark enough interest in young learners to explore the world of Mathematics independently. Moreover, the Department gives equal priority to teaching, research, and real-life applications of Mathematics. All courses of the Department are periodically reviewed and updated by renowned institutes and industry experts.

## Values

We believe in the philosophy of inclusive learning and open discussions while imparting good ethical and moral values to our students. From teaching a class to publishing research and developing an algorithm, our department believes in inclusivity and equal opportunity for all the sections of society. Besides, we try to nurture a holistic point of view towards education.

# Faculty Details

- **Dr. Ravi Srivastava**
  Assistant Professor
  Ph.D (IIT Guwahati-2012), NET-JRF, M. Sc (BHU), B. Sc (V.B.S. Purvanchal University)
  **Area of Interest:** Numerical Linear Algebra, Spectral Graph Theory.

- **Dr. Om Prakash**
  Assistant Professor & HOD
  Ph.D (IIT Kharagpur-2013), NET-JRF, M. Sc (BHU), B. Sc (V.B.S. Purvanchal University)
  **Area of Interest:** Production Planning and Inventory Control, Operational Research, Mathematical Finance.

# Temporary Faculty Members

**Dr. Suresh Kumar Choubey**
Assistant Professor

**Dr. Prashant Jha**
Assistant Professor

## Project Details at Department of Mathematics

- **Hybrid Production System with Uncertain Return Quality and Different Remanufacturing Policies**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India ***(Rs. 2 lacs).***
- **Spectral Properties of Corona Product of Signed Graphs under HK Marking**, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India ***(Rs. 2 lacs).***

## Departmental Committees

| Sl. No. | Name of the Faculty Members | Name of the Committee / Cells |
|---|---|---|
| 1 | i) Dr. Ravi Srivastava (Convenor)<br>ii) Dr. Om Prakash (Member and HoD)<br>iii) Dr. S K Choubey (Member)<br>iv) Dr. Prasant Jha (Member)<br>v) Dr.Anindya Biswas (Member) | Departmental Post Graduate Committee (DPGC) |

## Research Scholar Details

| Sl. No. | Scholar | Guide(s) | Research Area |
|---|---|---|---|
| 1 | Ms. Aparajta Bohara | Dr. Ravi Srivastava<br>Dr. Sangram Ray (CSE)<br>Dr. G. P. Singh (JNU) | Spectral Graph Theory |

# Department of Physics

*Not only is the Universe stranger than we think, it is stranger than we can think.*

**Werner Heisenberg**

The Department of Physics has been an integral part of the National Institute of Technology Sikkim since its establishment in the year 2010. The Faculty members of the Department are actively engaged in the Institute Administration, Teaching and Research. The Department is engaged in the following Areas of Research – effect of noise on nonlinear systems, nonlinear dynamics, quantitative finance, time series analysis of stock market, low temperature physics, quantum information and its interface with many-body physics.

The Department presently offers Ph.D. program and aspires to offer M.Sc. program very soon. In line with the National Education Policy 2020, the Department is also envisioning offering B.Sc. Program in Physics. The proposed expansion program of the Department requires induction of quality Faculty members capable of strengthening teaching and research faculties. The Department which has some expertise in new age research areas of Quantum Information and Computation, will look for expertise in diverse cutting-edge areas of research in the imminent future. The goal of the Department is to kindle the inquisitive mind of students, ensure that they are knowledgeable in their subject domain, prepare them to adapt to the rapidly changing world, and help them lead a happy and successful life.

Presently, the Department offers Engineering Physics course to different Engineering branches of B. Tech. program. The Department has offered various courses like Electromagnetic Field Theory, Introduction to Electronics Engineering Profession, Mathematics, Solid State Devices etc. courses to B. Tech students of Engineering disciplines, in the past few years. The Faculty members of the Department have adapted to the present pandemic scenario and offered online classes to the students during the financial year 2020-21. All course materials have been digitized and sent to the students through email. The Department has used high quality NPTEL and other MOOCs courses to aid in the teaching-learning process. The Department understands that although there has been huge improvement in internet connectivity facilities during the recent years, some students residing in remote areas face connectivity issues. In order to alleviate their problems, every online class has been recorded and sent to them over email. The evaluation procedure was also completed online and using telephone, ensuring ample opportunity even to the most disadvantaged student. The laboratory classes were also conducted using the Ministry of Education's Virtual Laboratories available online.

At present the Department has limited laboratories due to non-availability of laboratory space at in the temporary campus. However, the Institute is trying to create more space by constructing industrial sheds to establish necessary laboratories. The Institute is also hopeful of having a permanent campus soon.

# Faculty Details

- **Dr. Anindya Biswas**
  Assistant Professor
  Postdoc at HRI Allahabad (Prayagraj), IMSc Chennai, IACS Kolkata, Ph.D (University of Calcutta)
  M.Sc (University of Calcutta)
  **Area of Interest:** Low temperature physics, BEC, Quantum information and its interface with many-body physics

- **Dr. Md. Nurujjaman**
  Assistant Professor
  Postdoc at Tata Institute of Fundamental Research Centre for Applicable Mathematics Bangalore, Ph.D (Homi Bhabha National Institute, BARC),
  M.Sc. (Jadavpur University)
  **Area of Interest:** Experimental nonlinear dynamics, stock market dynamics

# Staff Details

**Happy Mondal**
Laboratory Assistant

## Laboratory Facilities

1. **Engineering Physics Laboratory:** The Engineering Physics Laboratory of the Department is equipped with necessary instruments to facilitate the freshmen to experience the wide scope of the subject. There are experimental facilities to investigate the properties of Semiconductors, Laser diode, Hall Effect, magnetic field due to current carrying coils, magnetic susceptibility of liquids. The students are also exposed to some optical phenomena like total internal reflection of light and interference of light through experiments involving optical fibers, Newton's ring apparatus and Michelson Interferometer. These are some of the experiments they study in their theoretical Engineering Physics course. The fiber optics apparatus is used to measure numerical aperture of optical fiber while the Michelson Interferometer apparatus can be used to determine the wavelength of the light source.

## Engineering Physics Laboratory

2. **Research Laboratory:** The Research Laboratory has the necessary equipment to support the research initiatives of the Department. The following necessary equipment are available in the laboratory:

   - *BARASOL BMC2 radon monitor*: A semiconductor detector manufactured by Algade, France to detect the radon gas concentration in the earth crust through which one can monitor movement of the Earth-crust. It has a measuring time window adjustable from 1 to 240 min, and the detection range is from 0 $Bq/m^3$ to 1 $GBq/m^3$.

   - *Workstations*: Presently, there are two workstations in the Department, one of which has Intel Xeon 6128 3.4 GHz 6 core processor and 512 GB RAM. Presently, this workstation is being used to study the properties of entangled spin systems from the perspective of Quantum Information. Work is in line with initiative from the Government of India to promote research in the field of Quantum Information and Computation. Some of the computation done by researchers in the Department of Physics involves simulations of quantum bits or qubits. As a part of the computation, one has to diagonalize large matrices. For example, if a physical system of, say, 16 qubits (particles) is investigated, one has to diagonalize a matrix consisting of $2^{16}x2^{16}$ elements, the storage of which requires 4 GB of memory space. The memory requirement for computation grows exponentially with the size of the system being investigated. It may be noted that methods like Lanczos diagonalization algorithm are not always useful and complete diagonalization is essential. The entire computation requires a few hundred gigabytes of storage space. The workstation has made such intricate mathematical problems tractable. The other workstation is being used for investigating and predicting stock markets using ideas from non-linear dynamics. The workstations can be used for parallel programming and are fitted with GPU card for programming.

   - *Series Waveform Generator*: It is used to generate various types of analogs as well as digital signals.

   - *High-end Digital Storage Oscilloscope*: Digital Storage Oscilloscope is used to monitor the electronic signals. It is also used to acquire long data from various electronic circuits.

*Research Laboratory*

## Departmental Committees

| Sl. No. | Name of Faculty members | Name of the committee |
|---|---|---|
| 1. | 1. Dr. Anindya Biswas, Convenor<br>2. Dr. Md. Nurujjaman | Departmental Faculty Board (DFB) |
| 2. | 1. Dr. Md. Nurujjaman, Convenor<br>2. Dr. Anindya Biswas<br>3. Dr. Om Prakash, Department of Mathematics | Departmental Post Graduate Committee (DPGC) |
| 3. | Dr. Md. Nurujjaman | Laboratory In-Charge |

## Ongoing Project details in the Department

- ***Innovative and sustainable decision support system for drinking water security in Indian Himalayan region of Sikkim and West Bengal***, funded by The Ministry of Environment, Forest & Climate Change (MoEF&CC) (Rs.50 lacs).
- ***Investigation of "shared p urity" of quantum states,*** Seed grant funded by TEQIP-III, NPIU, Ministry of Education, Govt. of India (Rs. 2 lacs).
- ***Identification of earthquake-induced anomalies in complex soil Rn-222 time series***, Seed grant funded by TEQIP-III, NPIU, Ministry of Education, Govt. of India (Rs. 2 lacs).

## Collaboration with other Departments / Institutes

The Department has active research collaborations with Saha Institute of Nuclear Physics, Kolkata, Jadavpur University, Presidency University and Harish-Chandra Research Institute, Prayagraj. Radon gas monitoring system, a possible avenue for early earthquake detection, has been installed at NIT Sikkim in collaboration with Jadavpur University.

## Research Scholars Details

| Sl. No. | Scholars | Guide(s) | Area of Research |
|---|---|---|---|
| 1 | Ajit Mahata | Dr. Md. Nurujjaman | Nonlinear time series analysis of stock market. |
| 2 | George Biswas | Dr. Anindya Biswas | Investigation of quantum entanglement and other quantum measures in many-body quantum systems. |
| 3 | Anish Rai | Dr. Md. Nurujjaman | Nonlinear Time-series Analysis, Characterization of Stock Market |
| 4 | Nilanjan Nandi | Dr. Anindya Biswas | Quantum Information Science |

## Workshops

The Department has organized two online Faculty Development Programs (FDPs) during the financial year 2020-21. Eminent researchers from IITs, NITs and other reputed Universities and premier Research Institutes delivered lectures in the FDPs. Faculty members, Research Scholars and Post Graduate Students of Institutes and Universities from across India participated in the FDPs. The Faculty Development Programs are listed below.

1. Faculty Development Program on Effective Research Proposal Writing – Challenges, Strategies and Guidelines, 9th to 13th March 2021 — sponsored by AICTE (organized jointly with the Department of Electrical and Electronics Engineering)

### Resource persons

| | | |
|---|---|---|
| Prof. Ajoy Kumar Ray, Director, JISIASR Kolkata | Prof. Adrijit Goswami, IITKgp | Prof. Mainak Sengupta, IIEST |
| Dr. Arkopal Kishore Goswami, IITKgp | Dr. Rajeev Sharma, DST | Dr. Gaurav Gupta, Cyber-Laws and E-Security Group |
| Dr. Brajesh Kumar Dubey, IITKgp | Prof. HiranmaySaha, IIEST | Prof. Anirban Gupta, IIEST |
| Prof. Anirban Chakraborti, JNU | Ms. Priyanka Tomar, BPRD | Prof. Bhargab Maitra, IITKgp |
| Dr. Rohit Bhakar, MNIT | Dr. Sushil Kumar, NPL | Prof. Bidyadhar Subudhi, IIT Goa |

2. Faculty Development Program on Quantum Information and Computation, 5th to 17th October 2020 — sponsored by TEQIP-III

### Resource persons

| | | |
|---|---|---|
| Prof. Aditi Sen De, HRI | Prof. Ujjwal Sen, HRI | Dr. Kanhaiya Pandey, IIT Guwahati |
| Dr. Indranil Chakrabarty, IIIT Hyderabad | Dr. Ramij Rahaman, Presidency University | Dr. Amit Kumar Pal, IIT Palakkad |
| Prof. Archan S Majumdar, SNBNCBS | Dr. Sandeep K Goyal, IISER Mohali | Dr. Prabha Mandyam, IIT Madras |
| Prof. Arun Kumar Pati, HRI | Prof. T. S. Mahesh, IISER Pune | |
| Dr. R Prabhu, IIT Dharwad | Dr. Baladitya Suri, IISc | |

# Department of Chemistry

*Chemistry – the "Central Science" that connects physical and life sciences, and the basic sciences with applied disciplines such as medicine, material sciences, technology and engineering.*

The Department of Chemistry is an integral part of NIT Sikkim since its establishment in 2010. Since inception the Department offered various courses in the first year of the B.Tech program. The Department started Ph.D program in Chemistry in 2015. Since 2017, with the starting of a two year M.Sc. program in Chemistry, the Chemistry department has evolved into a full-fledged, degree awarding Department of the Institute. Students from across the country take admission in the M.Sc. program through Centralized Counselling for M.Sc. in NITs (CCMN) and Institute Admission Test (IAT). For the last four years, M.Sc. seats have been filled-in to the fullest capacity. The M.Sc. curriculum is designed at par with the best Universities / Institutes of the country and takes into consideration the needs of academia and industry. The curriculum is designed in such a way that it also fulfils the needs of the students to qualify national level competitive tests like NET and GATE. Practical Training courses are mandatory in the curriculum and students also undergo internships in various institutions of academic excellence and reputed industries. M.Sc. students have been placed in various pharmaceutical industries, contract research organizations and educational technology companies through campus placement drives.

The Department boasts of academically distinguished faculty members. The Department has well equipped laboratories to support the practical courses in B.Tech and M.Sc. programs. The Department has a vibrant research environment with Research Scholars and Faculty members currently executing several sponsored projects funded by the DST, CSIR and DBT, Govt. of India. Faculty members of the Department regularly publish research papers in internationally acclaimed journals.

Special Achievement in 2020: The Department of Chemistry of NIT Sikkim ranked 69th among the Indian academic institutes (Chemistry) in the Nature index for the year 2020 (published by Nature). Among the 31 NITs, the Chemistry department of NIT Sikkim ranked 6th (Source: https://www.natureindex.com/annual-tables/2020/institution/academic/chemistry/countries-India).

## VISION

Our vision is to enhance our reputation as a nationally acclaimed teaching and research institution which is recognized for its innovation, excellence and discovery, and attracts the best students, faculty and staff nationwide. The curriculum is designed for holistic development of the students and imparts practical trainings to make them industry ready. The Department aspires to be regarded as the best in North-East NITs, and in the Top 10 amongst the NITs in India and in the Top 50 Chemical Sciences teaching institutions in India.

## MISSION

Our mission is to maintain a Department that stands equal to any in terms of its relevance of teaching and research, facilities as well as the learning opportunities and working experience. The Department endeavors to advance the society through chemistry education, research, and service via multidisciplinary and international collaborative discovery, mentoring and leadership, and economic impact through technology transfer and entrepreneurship. The Department enables Student / Faculty team achievement, professional service, recognition, and global engagement via unique Molecular Science & Technology Centers of Excellence leveraging NIT Sikkim's core strength. The Department defines and delivers exemplary contributions to the mission, goals, and research focus areas of NIT Sikkim.

## VALUES

We aspire to values which are based on the highest professional and academic standards in terms of personal growth and satisfaction offered to our Students, Faculties and Staffs, excellence in what we do, teamwork that is based on respect, trust, integrity and moral ethics.

## Programs offered by the Department

- M.Sc. in Chemistry
- Ph.D in Chemistry

## Courses offered by the Department to B.Tech Students

- Engineering Chemistry, Engineering Chemistry Laboratory and Health, Safety and Environment.

## Student Strength

The intake in 2 years M.Sc program was increased in 2020 from 15 to 19 due to implementation of General Economically Weaker Section (GEN-EWS) seats.

Ph.D Research Scholars –Five (05)

M.Sc. First year (2020-22) – Studying: Fifteen (15); Intake: 19; Admitted: 18 (CCMN: 16 + IAT: 02); Quit: 03;

M.Sc. Second year (2019-21) – Studying - Fifteen (15); Intake: 15; Admitted: 15; Quit: 00;

# Faculty Details

- **Dr. Taraknath Kundu**
  Assistant Professor & HOD
  Postdoc (Bose Institute, 2008-09, IISc. Bangalore, 2009-12),
  Ph.D (Bose Institute / Jadavpur University, 2008)
  M.Sc. (University of Calcutta, 2001)
  **Area of Interest:** Synthetic Organic Chemistry; Medicinal Chemistry

- **Dr. Achintesh Narayan Biswas**
  Assistant Professor
  Postdoc (University of Minnesota, USA 2012-13),
  Ph.D (University of North Bengal, 2011), M.Sc. (University of North Bengal, 2003)
  **Area of Interest:** Artificial Photosynthesis, Small Molecule Activation, Bio-inspired Catalysis

- **Dr. Sumit Saha**
  Assistant Professor
  Ph.D (IACS / Jadavpur University, 2012), M.Sc. (IIT Kharagpur, 2007)
  **Area of Interest:** Synthetic organic chemistry, Total synthesis of natural products

# Temporary Faculty

**Dr. Nidhi Govil**

**Dr. Biplab Kumar Maiti**

**Dr. Sumantra Bhattacharya**

**Dr. Sruthi Guru**

**Dr. Sabyasachi Pramanik**

# Staff Details

**Mr. Suman Pathak**

**Ms. Chandrama Majumdar**

## Ph.D Scholars

| Sl. No. | Name of the Ph.D Scholar | Topic | Supervisor |
|---|---|---|---|
| 1 | Mr. Sachidulal Biswas | Small Molecule Activation | Dr. Achintesh Narayan Biswas |
| 2 | Ms. Srijana Subba | Total Synthesis of Natural Products | Dr. Sumit Saha |
| 3 | Mr. Srijan Narayan Chowdhury | Dioxygen Reduction | Dr. Achintesh Narayan Biswas |
| 4. | Mr. Panjo Lepcha | Catalytic Water Oxidation | Dr. Achintesh Narayan Biswas |
| 5 | Mr. Ramanand Das | Synthesis of C-glycosides | Dr. Taraknath Kundu |

## Laboratories and Research Facilities

| Sl. No. | Name of the Laboratory | Objectives | Available Instruments | Faculty In-charge |
|---|---|---|---|---|
| 1 | Engineering Chemistry | To equip all first year students of B.Tech program with the knowledge of material science, qualitative and quantitative estimations, and environmental impacts. | Microbalance, Microcentrifuge, pH meters, Conductometers, Hot air oven, vacuum pumps, fridges, etc. | Dr. Sumit Saha |
| 2 | M.Sc. Organic Chemistry | To teach M.Sc. students about organic qualitative & quantitative estimations, functionalization of organic molecules, isolation and characterization of natural products, multistep syntheses, and biochemistry experiments. | EyelaRotar Evaporator with chiller, Eyela PSL1810 80°C reaction chamber, JASCO FT-IR 4700, Metler-Toledo 0.01mg microbalance, Glove box, -20°C etc. | Dr. Taraknath Kundu |
| 3 | M.Sc. Inorganic Chemistry | To teach M.Sc. students about identification of salts, qualitative & quantitative estimations, catalytic activities, bioinorganic chemistry. | Electrochemical Workstation, Gas chromatograph, Hansatech Oxygraph, BOD incubator, COD digester, etc. | Dr. Achintesh Narayan Biswas |
| 4 | M.Sc. Physical Chemistry | Quantitative estimations of physical constants, biophysical experiments. | Thermoscientific Evolution 300 UV-visible Spectrophotometer, Potentiometers, Polarimeter | Dr. Nidhi Govil |
| 5 | Computational Chemistry Laboratory | Molecular simulations, quantum chemical energy calculation, prediction of reaction pathways. | Gaussian 9 and Gaus View 5 | Dr. Sumantra Bhattacharya |

## Ongoing Projects / Schemes in the Department

- Tuning the Reactivity of Metal-oxygen Intermediates in C-H Activation and Water Oxidation, funded by SERB, DST (33 lacs).
- Molecular water Oxidation Catalysts based on Earth Abundant Transition Metals, funded by CSIR, Govt. of India (15 lacs).
- Synthesis of Condensed Heterocycles with Bioactive Potential, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India.
- Bioinspired Metal Complex as Electrocatalysis for Oxygen Reduction Reaction, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India.
- Medicinally potent Biologically Active Macrolactone: Initiative to Search Industrial Scale Synthesis, *Seed grant funded by* TEQIP-III, NPIU, Ministry of Human Resource and Development, Govt. of India.

## Collaboration with other Institutes

To conduct laboratory classes and research the Department has collaborated with the following Institutes:

- University of York, UK – Dr. Achintesh Narayan Biswas
- Max Planck Institute for Chemical Energy Conversion, Germany – Dr. Achintesh Narayan Biswas
- University of North Bengal, Siliguri – Dr. Achintesh Narayan Biswas / Dr. Sumit Saha
- Central University of Sikkim, Sikkim – All Faculty of the Department
- IIT Bombay – Dr. Sumantra Bhattacharya
- IISER Kolkata – Dr. Sumantra Bhattacharya
- Indian Association for the Cultivation of Science, Kolkata – Dr. Achintesh Narayan Biswas / Dr. Sumit Saha
- National Chemical Laboratory, Pune – Dr. Sumantra Bhattacharya
- CSIR- Indian Institute of Petroleum, Dehradun – Dr. Sumantra Bhattacharya

- University of Calcutta, Kolkata - Dr. Taraknath Kundu / Dr. Biplab K. Maiti
- Amity University, Kolkata - Dr. Taraknath Kundu
- Faculdade de Ciencas e Technologia Universidade Nova de Lisboa, Portugal - Dr. Biplab K. Maiti

## UGC-CSIR-NET & GATE 2020 Qualification Details

| Sl. No. | Name of the Student | Batch | Qualified Examination | All India Rank |
|---|---|---|---|---|
| 1. | Ms. Kongki Gogoi | 2018-2020 | GATE 2021 | 3270 |
| 2. | Vishal Rai | 2018-2020 | GATE 2021 | 4704 |
| 3. | Arindam Sana | 2020-2022 | GATE 2021 | 2291 |

## New Laboratory Setup

1. Erstwhile Materials Testing Laboratory of the Civil Engineering department was handed over to the Chemistry department. The said room is being converted into a laboratory for Physical Chemistry Laboratory and Analytical & Environmental Laboratory courses in M.Sc program.
2. Erstwhile Geotechnical Laboratory of the Civil Engineering department was also handed over to the Chemistry department. The said room is being converted into a laboratory for the first year Engineering Chemistry Laboratory course of B.Tech programs.

## Strengthening of Computational Chemistry Laboratory

Two state-of-the-art software packages were purchased for computation of highly accurate quantum chemical calculations in High Performance Computing. These are:

1. Amsterdam Molecular Simulation (AMS) suite for various calculation of properties in molecular and periodic systems.
2. Turbomole for study of molecular properties and reaction modeling.

## Departmental Activities

A five days' international online workshop on **"Recent Advances in Organic and Biomolecular Chemistry 2021 (RAOBC 21)"** was organized by Dr. Taraknath Kundu (Convener), Dr. Nidhi Govil(Coordinator), and Dr. Sumit Saha (Coordinator) during 22nd – 26th March, 2021 funded by TEQIP-III of the Institute. Renowned Scientists from UK, Germany, China, Portugal and various IITs, CSIR Labs, and CRO industry were the resource persons.

The department of Chemistry took special initiative to bring back M.Sc students to campus in February, 2021 for offline classes, practical courses, and project works. They returned to their homes after completion of even semester courses.

## List of PG Projects (2019-2021 Batch)

| Sl. No. | Name of the Student | Supervisor | Title of the Project |
|---|---|---|---|
| 01. | Subharanjan Muduli | Dr. Achintesh Narayan Biswas | Molecular Catalysts For Oxygen Reduction And Water Oxidation |
| 02. | Amarendra Doley | Dr. Sumantra Bhattacharya | Aggregation Induced Emission Based Dye Sensitized Solar Cell |
| 03. | Madhurendra Raj | Dr. Sumit Saha | Synthetic Study Towards(±) Dendrodolide L |
| 04. | Chinmoy Varun Konwar | Dr. Biplab K. Maiti | Interaction Between Iron And Serum Albumin: Spectroscopic Study |
| 05. | Jyoti Aggarwal | Dr. Biplab K. Maiti | Elevated Serum-Copper Level; Spectroscopic Study |
| 06. | Sweety | Dr. Achintesh Narayan Biswas | Role Of Redox-Inactive Metal Ions In The Reactivity Of Manganese-Oxo Complexes |

| Sl. No. | Name of the Student | Supervisor | Title of the Project |
|---|---|---|---|
| 07. | Kanchan | Dr. Prakash P. Neelakandan<br>Dr. Taraknath Kundu | Synthesis And Photophysical Studies Of Mn(I)-Functionalized Bodipy Compounds |
| 08. | Priyanka | Dr. Prakash P. Neelakandan<br>Dr. Sruthi Guru | Synthesis And Photophysical Properties Of Dye Loaded-Nanoparticles |
| 09. | Kondhare Ganesh Hanumant | Dr. Sumit Saha | Synthetic Study Towards Optically Active Epoxide |
| 10. | Mansi Mani Singh | Dr. Taraknath Kundua | Synthesis Of C-Glycoside From D- Glucose By Photoredox Reactions |
| 11. | Riya Paul | Dr. Achintesh Narayan Biswas | Oxidative Reactivity of Iron (III) CyclamComplex |
| 12. | Bidisa Dowara | Dr. Kalyan Jyoti Deori<br>Dr. Sumit Saha | Design Of Bimetallic Agni Alloy Nanoparticles As An Efficient Photocatalyst For The Synthesis Of Azobenzene Under Visible Light |
| 13. | Prasanjit Modak | Dr. TaraknathKundu | Synthesis Of Potentially Bioactive Thiazolo [5,4-E] Indoles By Photoredox Method |
| 14. | Anshumala Dutta | Dr. Rahul Kar<br>Dr. Sumantra Bhattacharya | Antioxidant Behavior Of p-Coumaric Acid With The Approach Of Hydroxyl Free Radical |
| 15. | Chayanika Hazarika | Dr. Sruthi Guru | Synthesis Of Mg(OH)2 Nanoparticles Using Orange Peel Extract And Polysorbate-80 For Soil And Water Remediation Applications |

## Departmental Responsibilities

| Sl. | Responsibility | Faculty In-charge |
|---|---|---|
| 01. | Head of the Department | Dr. Taraknath Kundu |
| 02. | M.Sc Admission (Dy. In-charge, Centralized Counseling for M.Sc. in NITs) and Convener, Institute Admission Test for M.Sc.) | Dr. Taraknath Kundu |
| 03. | Convener, Institute Admission Test 2020 for admission in M.Tech / M.Sc. programs | Dr. Taraknath Kundu |
| 04. | Department Post-Graduate Committee (DPGC) | Dr. Sumit Saha (Convener)<br>Dr. Taraknath Kundu (HOD)<br>Dr. Achintesh Narayan Biswas (Member)<br>Dr. Nidhi Govil (Member)<br>Dr. Sumantra Bhattacharya (Member)<br>Dr. Sabyasachi Pramanik (Member)<br>Dr. Dhananjay Tripathi (Nominated Member by Chairperson Senate) |
| 05. | Academic Performance Evaluation Committee | Dr. Taraknath Kundu (Convener)<br>Dr. Achintesh Narayan Biswas (Member)<br>Dr. Sumit Saha (Member)<br>Dr. Nidhi Govil (Member) |
| 06. | M.Sc. Physical Chemistry Laboratory | Dr.Nidhi Govil |
| 07. | M.Sc. Inorganic Chemistry Laboratory | Dr. Achintesh Narayan Biswas |
| 08. | M.Sc. Organic Chemistry Laboratory | Dr. Taraknath Kundu |

| Sl. | Responsibility | Faculty In-charge |
|---|---|---|
| 09. | M.Sc. Analytical and Environmental Chemistry Laboratory | Dr. Biplab Kumar Maiti |
| 10. | M.Sc. Computational Chemistry Laboratory | Dr. Sumantra Bhattacharya |
| 11. | B.Tech Engineering Chemistry Laboratory | Dr. Sumit Saha |
| 12. | Departmental Member in Examination Cell | Dr. Sumantra Bhattacharya |
| 13. | Departmental Member in Institute Research Committee | Dr. Biplab Kumar Maiti |
| 14. | Departmental Record Keeping | Dr. Biplab Kumar Maiti |
| 15. | Faculty Advisors | Dr. Taraknath Kundu<br>Dr. Achintesh Narayan Biswas<br>Dr. Sumit Saha |

*M.Sc. 2020-22 Batch Students doing Laboratory Class in March 2021*

*Chemistry Research Laboratory*

*Thermo Evolution 300 UV-Vis Spectrophotometer*

# Department of Humanities and Social Sciences

*The Humanities should constitute the core of any university worth the name.*

**Terry Eagleton**

The Department of Humanities and Social Sciences is interdisciplinary in orientation and offers Undergraduate courses to the Engineering students in English, Economics, and Management. The Department started its Ph.D. program in 2014 and it aims to introduce Postgraduate course in future. Presently, areas of topical interest such as Modern Indian Fiction, Cinematic Adaptations of Shakespeare, and North-Eastern Literature in the subject discipline of English and Industrial Economics & Entrepreneurship in the subject discipline of Economics are explored by the Departmental Faculty and Research Scholars. Specific courses on Communicative Skills, Phonetics, Linguistics, and Certificate Courses on some of the regional and European languages feature in the long-term agenda of the Department. The Department strongly believes in providing opportunities to students for discussion and debate to meet the challenges of a highly competitive and ever-changing world. The Department fosters to inculcate an interdisciplinary approach among the students by collaborating with other premier educational institutes of the country.

The Department envisages in preparing the Undergraduate students for placements in conformity with the industrial working environment. Continuous revision of the curriculum and the syllabus is made to cater to the requirements of the industry. With approval from the Senate of the Institute, contents of the Curriculum Development Workshop of 2017 were implemented by offering two new core courses entitled English Language and Literature and *Human Values and Effective Communication* in English. The earlier courses of Economics and Management were restructured into *Engineering Economics* and *Principles of Management*.

The Department has also volunteered to offer an audit course entitled Professional Practice (English) to enhance and adept the communication skills of the students and for their better performance in placement drives. This course, after its implementation in 2018, actually had a fairly good effect on the personality and understanding of the students that is evident through the positive impact on the student's results in the subsequent semesters in all departments. The positive impact of the audit course can also be noticed through even better performance in the placement drives. It is imperative to mention that from the induction of the course in the curriculum in 2018 the overall placement record of the Institute has witnessed a steady increase as evident from the fact that the placement percentage for the year 2018 was 52%, for 2019 was 65%, for 2020 was 65% and it further increased in the year 2021 to 71%. To further encourage this growth, the department is committed towards its positive contribution in the placement of the students of the Institute.

For a sound and experiential learning the Department instils in young minds the aptitude for English speaking through group discussions, debates and extempore. A Curriculum Development Workshop of May 2019 witnessed leading academicians with their insight and experiences in improving the existing curriculum.

## Courses offered by the Department to B. Tech Students

- English Language and Literature (HS11101) - B. Tech 1st Year
- Human Values and Effective Communication (HS12101) - B. Tech 1st Year
- Professional Practice (ZZ12402) – B. Tech 1st Year
- Engineering Economics (HS15101) – B. Tech 3rd Year
- Principles of Management (HS16101) – B. Tech 3rd Year

## Language Laboratory for B. Tech students

To enhance the language learning capability of B. Tech students, an iTell-Orell Digital Language Laboratory with state-of-the-art facilities was established in December 2019. The laboratory is designed in cognitive science perspective and explores the relationship of human language with cognition and culture through the studies of language processing in various domains. The arena of language studies coupled with human-computer interface opens up new vistas of understanding by helping students measure the depth of their language learning capabilities. In order to achieve these ends, a modern academic research laboratory has been set up to focus on the way a speech is produced, comprehended, processed and acquired.

# Faculty Details

- **Dr. Dhananjay Tripathi**
  Assistant Professor
  D. Phil (University of Allahabad, 2013), M.A. (University of Allahabad, 2006)
  **Area of Interest:** Literary Criticism, Myth and its Retelling, Indian English Writing.

- **Dr. Richa Mishra**
  Assistant Professor (Temporary)

- **Dr. Marxia Oli. Sigo**
  Assistant Professor (Temporary)

## Research Scholars

| Sl. No. | Name | Supervision and Guide | Broad Area of Research |
|---|---|---|---|
| 1. | Mrs. Laxmi Rai | Dr. Dhananjay Tripathi | Cinematic Adaptations of Shakespeare |
| 2. | Mrs. Lekha Rai | Dr. Dhananjay Tripathi | North-Eastern Literature |
| 3. | Mr. Bhaskar Chettri | Dr. Dhananjay Tripathi | Modern Indian Fiction |
| 4. | Ms. Ankita Sarmah | Dr. Dhananjay Tripathi & Dr. Bedabrat Saikia (Co-Supervisor) | Industrial Economics & Entrepreneurship |

## Research Project Completed

**The Occult Tradition of Shamanism in Sikkim: A study of its core belief and Tribal Nature**, funded by ICSSR

## Research Project Ongoing

ICSSR funded project titled - **Covid-19 and its impact on Sikkim: A study of how and why Sikkim becomes an exception** granted to **Dr. Dhananjay Tripathi**

## Workshop / Faculty Development Programmes Organised

(i) The Department of Humanities and Social Sciences, National Institute of Technology Sikkim organised a One Week Online Workshop on BUILDING PROFICIENCY IN ACADEMIC WRITING, from 29th September - 3rd October 2020. The workshop was fully funded by TEQIP-III, Ministry of Education, Government of India.

(ii) The Department of Humanities and Social Sciences, National Institute of Technology Sikkim organised a One Week Online Faculty Development Programme on STRATEGIES IN MODERN PEDAGOGY, from 16th - 20th February 2021. The workshop was sponsored by ALL INDIA COUNCIL FOR TECHNICAL EDUCATION (AICTE).

(iii) The Department of Humanities and Social Sciences, National Institute of Technology Sikkim organised a One Week Online Faculty Development Programme on ENTREPRENEURSHIP DEVELOPMENT: CHALLENGES & OPPORTUNITIES, from 23rd – 27th March 2021. The workshop was fully funded by TEQIP-III, Ministry of Education, Government of India.

Many Research Scholars and Teaching Faculties participated and benefitted from the Workshop and the Faculty Development Programmes. They shared their learning experiences in the feedback session.

## Departmental Committees

| Sl. No. | Name of Faculty Member | Name of Committee |
|---|---|---|
| 1 | Dr. Dhananjay Tripathi | Head of the Department |
| 2 | Dr. Dhananjay Tripathi<br>Dr. Richa Mishra<br>Dr. Marxi Oli | Departmental Faculty Board |
| 3 | Dr. Dhananjay Tripathi<br>Dr. Richa Mishra<br>Dr. Maxia Oli<br>Dr. Achintesh N Biswas (External)<br>Dr. Sanjay K Jana (External)<br>Dr. Samgram Ray (External) | Department Post Graduate Committee |
| 4 | Dr. Richa Mishra | Faculty Mentor B.Tech 1st Year |
| 5 | Dr. Dhananjay Tripathi<br>Dr. Richa Mishra<br>Dr. Maxia Oli | Committee for Promotion of India Language and Culture under NEP 2020 |
| 6 | Dr. Dhananjay Tripathi | Faculty In Charge - Training and Placement Cell |
| 7 | Dr. Richa Mishra | Department Annual Report Committee |
| 8 | Dr. Dhananjay Tripathi<br>Dr. Richa Mishra<br>DR. Maxia Oli | Department Grade Moderation Committee |
| 9 | Dr. Dhananjay Tripathi | Public Information Officer |
| 10 | Dr. Dhananjay Tripathi | Faculty In-charge Publication and Web Information System |

## Impact of Covid-19 Pandemic on the Departmental Activities

The Covid-19 pandemic have ravaged humanity throughout the world, lives have almost come to a standstill with the lockdowns and the restrictions imposed on movement and normal functioning of day-to-day human activities. Superpowers and developing nations are equally battling the tough times against the pandemic. Life at NIT Sikkim is also not an exception. Classes and examinations are all shifted to the online platform changing the routine lifestyle at the Institute. Even the Seminars, Workshop, Faculty Development Programmes et al that would have otherwise been held at the Institute campus were held virtually. The Departmental interviews for fresh Ph.D. recruits and project assistant were resorted to virtual meets. Several lectures of distinguished guests were cancelled owing to the pandemic.

## Various other Activities organized by the Department Club, The Regnant Ink

The Regnant Ink was established on 24th February 2018 with a vision of holistic development of students inclusive of literary and vocal temper at National Institute of Technology Sikkim. Undeterred by pandemic blues, it is congenial that the institute is being outright through the academic sessions successfully. In addition to this, in order not to make the students feel that there is a lack of effort in their extracurricular side of college life, The Regnant Ink conducted all the events online such as Confluence, Prove us Wrong, etc in a successful manner, glimpses of which are shown below.

## The events organized are listed below

| Sl. No. | Event | Date |
|---|---|---|
| 1. | Cleanliness Drive | 26-01-2020 |
| 2. | International Mother Language Day | 1-03-2020 |
| 3. | Confluence | 24-07-2020 to 30-08-2020 |
| 4. | Hindi Pakhwada | 12-09-2020 to 17-09-2020 |
| 5. | Prove Us Wrong | 19-12-2020 to 20-12-2020 |
| 6. | Republic day | 26-01-2021 |
| 7. | Aazadi ka Amrit Mahotsav | 12-03-2021 |

The Regnant Ink

## 1. Cleanliness Drive

A cleanliness drive was organised on 02nd October 2020 by "The Regnant Ink" on the occasion of Gandhi Jayanti to promote "Swachata hi Sewa" under the Swachh Bharat Abhiyaan introduced by honourable Prime Minister Shri Narendra Modi. Around 100 students participated in this campaign. The drive was remarkable with numerous students as well as teachers participating side by side. All the places within the institute premises including academic building, administrative building, multi-purpose hall, park and hostels were targeted for cleanliness.

## 2. International Mother Language Day

Language is not only a mode of communication, but it also holds the key to one's identity and an intensive link to one's culture as well. The Regnant Ink celebrated International Mother Language Day on 1st March 2020 at the multipurpose hall. The chief guest of the event was Dr. Rajiv Kumar Rawat, a senior Hindi officer, IIT Kharagpur. who delivered an enlightening lecture on the importance of mother language day. As a part of this event, various students exhibited their culture through singing, dancing, skit, poetry using their respective mother languages such as Hindi, Bengali, Tamil, Telugu, Maithili, Bhojpuri, Nepali, Urdu, and many others. The event was a huge success with the active participation of more than 100 students. The event concluded with the national anthem being sung by all the attendees.


## 3. Confluence

The Regnant Ink introduced Confluence, a series of interactive sessions with various Alumnus, from 24th July 2020 to 30th August 2020 which functioned as a viaduct between the present and past generation of NIT SIKKIM.

The event comprised of six episodes and was streamed live on YouTube wherein the Alumni shared their fascinating stories, memories, struggles and experiences during their journey at the NIT SIKKIM campus. Students participated enthusiastically and had some memories to relate with the Speakers and had umpteen amounts of advice to take home.

| EPISODE | SPEAKER | DATE |
|---|---|---|
| 1 | Mr Rohan Mahapatra | 24/07/2020 |
| 2 | Mr Vishal Sharma | 1/08/2020 |

| EPISODE | SPEAKER | DATE |
|---|---|---|
| 3 | Ms Priyanka Minj | 9/08/2020 |
| 4 | Mr Anurag D.Gaur | 16/08/2020 |
| 5 | Mr Aditya Arya | 23/08/2020 |
| 6 | Mr Ajay Kumar | 30/08/2020 |

## 4. Hindi Pakhwada

An assortment of Online Events was organised under Hindi Pakhwada from 12-09-2020 to 17-09-2020, which primarily focused on the significance of Hindi language. The event provided every student with a platform to exhibit their skills in literature and art.

| Sl. No. | Event | Date |
|---|---|---|
| 1 | कविता पाठ | 14/09/2020 |
| 2 | कविता लेखन | 15/09/2020 |
| 3 | चित्रकारी प्रितयोगिता | 13/09/2020 - 17/09/2020 |
| 4 | निबंध लेखन प्रतियोगिता | 16/09/2020 |
| 5 | कहानी लेखन प्रितयोगिता | 17/09/2020 |
| 6 | फोटोग्राफी प्रितयोगिता | 13/09/2020 - 17/09/2020 |






## 5. Prove us Wrong

One should never shy away from discussion and this was substantiated yet again with our first Online Debate Competition "Prove us Wrong" which was organised on 19th and 20th December 2020. This was an Interdepartmental Debate Competition wherein students from all the departments actively participated and represented their respective department. The students sharpened their essential critical analytical & thinking skills and boosted their confidence to share their thoughts with other people.


| Sl. No. | Round | Date |
|---|---|---|
| 1. | Intra Departmental Debate Competition (Qualification Round) | 19-12-2020 |
| 2. | Inter-Departmental Debate Competition (Final Round) | 20-12-2020 |

## 6. Republic Day

On 26th January 2021, the 72nd Republic Day was celebrated by The Regnant Ink to commemorate the golden heritage of our country via online platform Google Meet with great fervour and passion.

The event commenced with an enlightening speech by Prof. M.C. Govil, the Director of National Institute of Technology Sikkim. This was followed by a short online skit "If national social issues were people" which illustrated the social dilemma and their perpetual solutions. This program consisted of cultural events like singing, dancing, poem recitation and many more. The alluring ceremony came to an end with the utmost satiation in the hearts of all.

## 7. Aazadi ka Amrit Mahotsav

The Regnant Ink, in collaboration with TEQIP III, organised "Aazadi ka Amrit Mahotsav" (inaugurated by our Honourable Prime Minister Shri Narendra Modi on 12th March 2021) acknowledging India's freedom struggle. The event was enriched by Shri Virendra Pathak, a senior journalist, as the Chief Guest of the Webinar who addressed the participants on "India's Freedom Struggle". His talk allowed the students to acquire great knowledge through his vast experience and prompt words. The Webinar was then followed by an Essay Writing Competition on the topic "The Unsung Heroes of Indian Freedom Fight: A Tribute".

# Technical Education Quality Improvement Program (TEQIP-III)

National Institute of Technology Sikkim is a beneficiary of Technical Education Quality Improvement Program (TEQIP-III). The Program, funded by the World Bank, is being implemented by National Project Implementation Unit (NPIU), Govt. of India. One of the key objectives of the project is to provide support to technical institutions in order to strengthen and improve the quality of education.

NIT Sikkim has been chosen as a mentee Institution and allocated a fund of rupees fifteen crores to improve quality and equity. The Institute is being mentored by Indian Institute of Technology, Kharagpur. The Institute has defined the following activities in the Institutional Development Proposal:

- Procurement of Goods (equipment, furniture, books, learning resources, software) and minor civil works to strengthen the academics and research activities of the Institute. Total fund allocated for this purpose is Rupees nine crores.
- Improvement in Teaching, Learning and Research competence. Total fund allocated under this budget head is Rupees four crores and fifty lakhs.
- The remaining budget of Rupees one crore and fifty lakhs is for miscellaneous / incidental expenditure required for successful implementation of the project.

For successful implementation of the project and to achieve the project goals, a dedicated team comprising of the following members has been formed.

| Sl. No. | Designation | Name of the Faculty Member |
|---|---|---|
| 1. | Institutional Project Director (IPD) | Prof. Mahesh Chandra Govil Director, NIT Sikkim |
| 2. | TEQIP Coordinator (TC) | Dr. Ranjan Basak |
| 3. | TEQIP Nodal Officer, Academic | Dr. Sangram Ray |
| 4. | TEQIP Nodal Officer, Finance | Dr. Anindya Biswas |
| 5. | TEQIP Nodal Officer, Procurement | Dr. Achintesh Narayan Biswas |
| 6. | Coordinator, Startup | Dr. Anjan Kumar Roy |
| 7. | Coordinator, Equity Action Plan | Dr. B Balaji Naik |
| 8. | Coordinator, Environment | Dr. Molay Roy |
| 9. | Coordinator, GATE | Dr. Tarun Biswas |

Various academic as well as procurement activities were planned under the TEQIP-III Project. We have successfully utilized the allocated fund under TEQIP-III Project. Expenditure incurred under various heads in the financial year 2020-21 is given below.

## Expenditure Incurred under TEQIP-III

| Sl. No. | Activities | Total Expenditure |
|---|---|---|
| 1. | Equipment | Rs. 52,22,830/- |
| 2. | Learning Resources | Rs. 55,17,095/- |
| 3. | Improve Student Learning | Rs. 11,39,059/- |
| 4. | Assistantships | Rs. 84,31,450/- |
| 5. | Faculty / Staff Development and Motivation | Rs. 17,82,382/- |
| 6. | Research and Development | Rs. 4,09,485/- |
| 7. | Reforms and Governance | Rs. 8,04,536/- |
| 8. | Consumables | Rs. 19,299/- |
| 9. | Operation & Maintenance of Equipment | Rs. 9,63,702/- |
| 10. | Office Expenses | Rs. 23,94,332/- |
| 11. | Meetings | Rs. 4,50,819/- |
| 12. | Travel Cost | Rs. 42,000/- |
| 13. | Salary | Rs. 8,94,000/- |
| | **TOTAL** | **Rs. 2,80,70,989/-** |

**Activities which have already been successfully implemented are as under –**

## Workshops / Trainings / Meetings conducted under TEQIP-III at the Institute

| Title | Name of Resource Persons | Dates |
|---|---|---|
| **Curriculum Development Workshop of Mechanical Engineering Department** | • Prof. Dilip Sharma, MNIT Jaipur<br>• Prof. Himanshu Chaudhary, MNIT Jaipur<br>• Prof. Murari Lal Mittal, MNIT Jaipur. | 5th August 2020 |
| **Short Term Training on "Effective Office Administration and Financial Management"** | • Prof. M. C. Govil, NIT Sikkim<br>• Prof. Udaykumar R. Yaragatti, MNIT Jaipur<br>• Prof. Lalit K. Awasthi, NIT Jalandhar<br>• Dr. S. K. Mishra, Dr B R Ambedkar National Institute of Technology, Jalandhar<br>• Dr. Sourav Gupta, Dr B R Ambedkar National Institute of Technology, Jalandhar<br>• Dr. Manish Jindal, NABET, New Delhi<br>• Shri Jayant Sharma, MNIT Jaipur<br>• Prof. K. R. Niazi, MNIT Jaipur<br>• CA Sahil Minda, NIT Sikkim<br>• Mr. R. K. Manjhiwal, IIT Jammu<br>• Mr. Jason Rajkumar, CAG Officer<br>• Mr. Birbal Singh, MNIT Jaipur<br>• Dr. Sarvesh K Tiwari, MNNIT Allahabad<br>• Shri Sonam Topgay Tashi, SDM Ravangla<br>• CA Sushil Das, Practicing CA<br>• Prof. R. L. Raina, JKLU, Jaipur<br>• Shri Deepak Maheshwari, MNIT Jaipur | 24th August to 11th September 2020 |
| **Cognitive Radio Technology: Concept, Evolution and Antenna Requirements** | • Prof. Chinmoy Saha, Department of Avionics, IISST, Trivandrum, Kerala | 19th September 2020 |
| **Workshop on "Awareness Campaign on Preventive Measure and Drug Demand Reduction"** | • Shri Prem Das Rai, SAATHI, EQUIP<br>• Prof. Pratima Murthy, NIMHANS Bangalore | 26th September 2020 |
| **Workshop on "Skill Development and Safety Training"** | • Prof. M. C. Govil, NIT Sikkim<br>• Shri G. P. Upadhyaya, Addition Chief Secretory of Govt. of Sikkim<br>• Dr. Sanjay Rai, Medical Officer, Namchi District Hospital<br>• Mr. Basudev Khanal, Ravangla Forest Officer<br>• Mr. Ram Nepal, NIT Sikkim<br>• Mr. Rahul Bhayut, NIT Sikkim<br>• Mr. Amit Maity, NIT Sikkim<br>• Mr. Subho Das, NIT Sikkim<br>• Mr. Rewanath Sharma, NIT Sikkim<br>• Mr. Manish Kumar, NIT Sikkim<br>• Mr. Amrit Sharma, NIT Sikkim<br>• Ms. Saheli Saha, NIT Sikkim<br>• Ms. Chanda Moktan, NIT Sikkim'<br>• Mr. Bhaskar Bhattarai, NIT Sikkim | 5th September to 3rd October 2020 |
| **Online Workshop on "Building Proficiency in Academic Writing"** | • Prof. Christopher Key Chapple, Loyola Marymount University, USA<br>• Prof. Frank G. Karioris University of Pittsburg, USA<br>• Dr. Gillian Dooley Flinders University (AUS),<br>• Prof. Kishore G. Kulkarni University of Denver (USA)<br>• Dr. Caroline Cambell, University of Leeds, UK<br>• Prof. L.R. Sharma, University of Allahabad, India<br>• Prof. Anurag K. Agarwal, Indian Institute of Management Ahmedabad | 29th September to 3rd October 2020 |

| Title | Name of Resource Persons | Dates |
|---|---|---|
| **Faculty Development Program on "Quantum Information and Computation"** | • Prof. Aditi Sen De, HRI<br>• Prof. Indranil Chakrabarty, IIIT Hyderabad<br>• Prof. Archan S Majumdar, SNBNCBS<br>• Prof. Arun Kumar Pati, HRI<br>• Prof. R Prabhu, IIT Dharwad<br>• Prof. Ujjwal Sen, HRI<br>• Prof. Ramij Rahaman, Presidency University<br>• Prof. Sandeep K Goyal, IISER Mohali<br>• Prof. T. S. Mahesh, IISER Pune<br>• Prof. Baladitya Suri, IISc<br>• Prof. Kanhaiya Pandey, IIT Guwahati<br>• Prof. Amit Kumar Pal, IIT Palakkad<br>• Prof. Prabha Mandyam, IIT Madras | 5th to 17th October 2020 |
| **Curriculum Development Workshop of Mechanical Engineering Department** | • Prof. Himanshu Chaudhary, MNIT Jaipur<br>• Prof. Achintya Mukhopadhyay, Jadavpur University<br>• Prof. Rajiv Kumar Garg, NIT Jalandhar. | 6th February 2021 & 10th February 2021 |
| **Online Workshop on "Machine Learning and Speech Processing"** | • Prof. M. C. Govil, NIT Sikkim<br>• Prof. Richi Nayak, QUT, Brisbane Australia<br>• Dr. Prasanta Kumar Ghosh, IISc Bangalore<br>• Prof. S.R.M. Prasanna, IIT Dharwad<br>• Dr. Narender N P, Aalto University, Finland<br>• Prof. Mikko Kurimo, Aalto University, Finland<br>• Dr. Santosh K Vipparthi, MNIT Jaipur<br>• Prof. Sat Gupta, USA<br>• Prof. K. S. Rao, IIT KGP<br>• Prof. Samudra Vijaya K, TIFR Mumbai<br>• Dr. Sudarsana Reddy Kadiri, Aalto University<br>• Dr. Syed Shahnawazuddin, NIT Patna | 15th to 19th February 2021 |
| **Online Workshop on "Recent Trend on Technologies in Environmental and Water Resources Management"** | • Prof. Rakesh Kumar, Director, NEERI<br>• Prof. Brajesh Kumar Dubey, IIT Kharagpur<br>• Prof. Riddhi Singh, IIT Bombay<br>• Prof. Deepak Kashyap, IIT Ropar<br>• Prof. Pawan Kumar Labhasetwar, CSIR NEERI<br>• Shri. Sumit Kumar, NIT Sikkim<br>• Prof. Somnath Mukherjee, Jadavpur University<br>• Prof. Biswajit Ruj, CSIR CMERI<br>• Prof. Rutuja M. Chavan, MANIT Bhopal<br>• Prof. Anirban Gupta, IIEST Shibpur | 22nd – 26th February, 2021 |
| **Online Workshop on "Recent Trends in Thermo-Fluids (RTTF 21)"** | • Prof. Suman Chakraborty, IIT Kharagpur<br>• Prof. Rajat Gupta, Director, NIT Mizoram<br>• Prof. Shailendra D Shamra, IIT Bombay<br>• Dr. Sirshendu Mondal, NIT Durgapur<br>• Dr. Pallab Sinha Mahapatra, IIT Madras<br>• Dr. Soumyadip Sett, IIT Gandhinagar<br>• Prof. Amaresh Dalal, IIT Guwahati<br>• Prof. Saptarshi Basu, IISc Bangalore<br>• Prof. Bijan Kumar Mandal, IIEST Shibpur<br>• Prof. Swarnendu Sen, Jadavpur University<br>• Dr. Souvick Chatterjee, Education Technical Evangelist | 22nd to 26th February 2021 |

| Title | Name of Resource Persons | Dates |
|---|---|---|
| **Short Term Course on "Emerging Trends on Internet of Things with Experimental Learning"** | • Prof. M. C. Govil, NIT Sikkim<br>• Prof. Dhananjay Singh, Hankuk University of Foreign Studies<br>• Dr. Amit Singhal, Bennett University<br>• Dr. Pilli Emmanuel, Shubhakar, MNIT Jaipur<br>• Prof. Brejesh Lall, IIT Delhi<br>• Dr. Madhusudan Singh, Woosong University<br>• Dr. N. S. Rajput, IIT (BHU)<br>• Service Engineer, Entuple Technology<br>• Service Engineer, CDAC, Bangalore<br>• Service Engineer, Edgate Technology<br>• Service Engineer, Keysight India | 22nd to 27th of February, 2021 |
| **Online Workshop on "Recent Trends in Power Systems 2021 (RTPS2021)"** | • Prof. Abhijit Chakrabarti, IIEST Shibpur<br>• Dr. Aniruddha Bhattacharya, NIT Durgapur<br>• Prof. Chandan Kumar Chanda, IIEST Shibpur<br>• Prof. Debapriya Das, IIT Kharagpur<br>• Prof. K Shanti Swarup, IIT Madras<br>• Prof. Khaleequr Rehman Niazi, MNIT Jaipur<br>• Prof. Nidul Sinha, NIT Silchar<br>• Dr. Rohit Bhakar, MNIT Jaipur<br>• Mr. Supriya Paul, Deputy General Manager, Power Grid Corporation of India Limited<br>• Prof. Swapan Kumar Goswami, Jadavpur University<br>• Dr. Tanmoy Malakar, NIT Silchar<br>• Dr. Tulika Bhattacharjee, Engineering Officer, Central Power Research Institute | 23rd to 27th February 2021 |
| **Webinar on "NEP 2020: Pioneering Academic Reforms"** | • Prof. M. C. Govil, Director NIT Sikkim<br>• Prof. Chandra Shakher, NIT Hamirpur<br>• Prof. Rajeev Tripathi, MNNIT Allahabad<br>• Prof. Rajat Gupta, Director, NIT Mizoram<br>• Prof. Udaykumar Yaragatti, Director, MNIT Jaipur | 24th February 2021 |
| **Online Workshop on "Application of Power Electronics and Drives to Industry"** | • Prof. Bhim Singh, IIT Delhi<br>• Prof. Mainak Sengupta, IIEST Shibpur<br>• Prof. Mukesh K. Pathak, IIT Roorkee<br>• Prof. Santanu K. Mishra, IIT Kanpur<br>• Prof. Anup K. Panda, NIT Rourkela<br>• Dr. Santanu Kapat, IIT Kharagpur<br>• Dr. Ranjan K. Behera, IIT Patna<br>• Shri Deepak Saini, BHEL, Bhopal<br>• Shri Pradeep K. Sanodiya, POSOCO, Mumbai | 2nd to 6th March 2021 |
| **Online Workshop on "Recent Advances in Infrastructure Technology"** | • Prof. Ananth Ramaswamy, IISc Bengaluru<br>• Dr. Koushik Roy, IIT Patna<br>• Prof. Amiya Kumar Samanta, NIT,Durgapur<br>• Prof. Subrata Chakraborty, IIEST, Shibpur<br>• Dr. Arnab Banerjee, IIT Delhi<br>• Dr. RomanbabuOinam, IIT Tirupati<br>• Prof. P K Goyal, DTU<br>• Dr. Vaibhav Singhal, IIT Patna<br>• Mr. Sumit Kumar, NIT Sikkim<br>• Prof. Sreekanta Das, University of Windsor<br>• Prof. Jyant Kumar, IISc Bengaluru<br>• Dr. Krishanu Roy, University of Auckland<br>• Dr. Mohana Shanmugam Sundaram, AIT, Thailand | 2nd to 6th March, 2021 |

| Title | Name of Resource Persons | Dates |
|---|---|---|
| **Workshop on Modern Antennas for Present and Futuristic Wireless Communication Technology** | • Prof. Satish Kumar, Director, NIT Kurukshetra<br>• Prof. Dr. Levent Sevgi, Professor, Istanbul Okan University<br>• Dr. Goutam Chattopadhyay, Senior Research Scientist, NASA-JPL California Institute of Technology<br>• Prof. Pradip Kumar Jain, Director, NIT Patna<br>• Prof. Satish K. Sharma, Director, Antenna & Microwave Lab, San Diego State University<br>• Prof. Rowdra Ghatak, Professor, NIT Durgapur<br>• Prof. Debatosh Guha, Abdul Kalam Technology Innovation National Fellow, and Professor, Institute of Radio Physics and Electronics, University of Calcutta<br>• Prof. M. M. Sharma, Professor, MNIT Jaipur<br>• Prof. Mohammad S. Sharawi, Département de génieélectrique Polytechnique Montréal<br>• Prof. S. S. Pattnaik, Director, NITTR Chandigarh<br>• Shri. Rajeev Jyoti, Distinguished Scientist & Deputy Director, SAC, ISRO | 8th to 13th of March 2021 |
| **Online Workshop on "Control Systems and Applications"** | • Prof. Mahesh Chandra Govil, Director, NIT Sikkim<br>• Prof. Byrana Nagappa Suresh, Chancellor, IIST Trivandrum<br>• Prof. Vinod Kumar, Vice Chancellor, JUIT, Himachal Pradesh<br>• Prof. Soumitro Banerjee, Dept. of Physical Sciences, IISER Kolkata<br>• Prof. Laxmidhar Behera, IIT Kanpur<br>• Prof. Debasish Ghose, Dept. of Aerospace Engg., IISc Bengaluru<br>• Prof. Amit Patra, IIT Kharagpur<br>• Prof. Binoy Krishna Roy, NIT Silchar<br>• Prof. Aparajita Sengupta, IIEST Shibpur<br>• Dr. Santanu Kapat, IIT Kharagpur<br>• Dr. Indrani Kar, IIT Guwahati | 9th to 13th March 2021 |
| **Online Workshop on "Contemporary Issues in Design and Manufacturing (CIDM 21)"** | • Prof. Karunesh Kumar Shukla, Director, NIT Jamshedpur<br>• Prof. Satish C. Sharma, IIT Roorkee<br>• Dr. Arijit Bhattacharya, Norwich Business School<br>• Prof. Himanshu Chaudhary, MNIT Jaipur<br>• Prof. SurjyaKanta Pal, IIT Kharagpur<br>• Prof. Mohammad Farooq Wani, NIT Srinagar<br>• Prof. Santanu Das, Kalyani Government Engineering College<br>• Prof. Rajiv Kumar Garg, NIT Jalandhar<br>• Prof. Debasis Datta, IIEST Shibpur<br>• Dr. Prashanta Kr. Mahato, Indian Institute of Technology (ISM), Dhanbad<br>• Prof. Goutam Sutradhar, Director, NIT Manipur<br>• Dr. Joy Prakash Misra, IIT BHU<br>• Prof. Amitava Ray, Jalpaiguri Govt. Engineering College | 15th to 19th March 2021 |
| **Online Workshop on "Fuzzy Logic Systems in Engineering Application (FLSEA 21)"** | • Prof. N.P. Padhy, Department of Electrical Engineering, IIT Roorkee<br>• Prof. Niladri Chatterjee, Department of Mathematics, IIT Delhi<br>• Prof. Shiv Prasad Yadav, Department of Mathematics, IIT Roorkee<br>• Prof. Snehashish Chakraverty, Department of Mathematics, NIT Rourkela<br>• Prof. Nirmal Baran Hui, Department of Mechanical Engineering, NIT Durgapur<br>• Prof. Rajesh Kumar, Department of Electrical Engineering, MNIT Jaipur<br>• Dr. Swagatam Das, Department of Electronics and Communication Sciences Unit, ISI Kolkata<br>• Dr. Haider Banka, Department of Computer Science and Engineering, IIT (ISM) Dhanbad<br>• Dr V Lakshmana Gomathi Nayagam, Department of Mathematics, NIT Trichy | 15th to 19th March, 2021 |

| Title | Name of Resource Persons | Dates |
|---|---|---|
| **Short Term Course on "Modern Wireless Communication Systems and Antenna Engineering with Experimental Learning"** | • Prof. Nuno Borjes Carvalho, Professor and a Senior Research Scientist with the Institute of Telecommunications, University of Aveiro, Portugal<br>• Prof. Arturo, YIC Technologies<br>• Dr. Sayantan Dhar, Bosch Engineering and Business Solutions<br>• Dr. Somak Bhattacharyya, IIT, Banaras Hindu University<br>• Dr. Aashish Mathur, IIT Jodhpur<br>• Dr. Debdeep Sarkar, IISc Bangalore | 15th to 20th March 2021 |
| **Online International Workshop on "Recent Advances in Organic and Biomolecular Chemistry 2021"** | • Prof. Javed Iqbal, Founder Chairman, Cosmic Discoveries, Former Professor IIT Kanpur, Former Global Head, Dr. Reddy's Laboratories<br>• Prof. Jose J. G. Moura, Portugal<br>• Prof. Lukas Hintermann, Technical University, Munich, Germany<br>• Prof. Andrew Wheatley, Cambridge, U.K.<br>• Prof. Yao Wang, Sangdong, China<br>• Prof. Suvarn Kulkarni, IIT Bombay<br>• Prof. C. V. Ramana, NCL Pune<br>• Prof. Subi Jacob George, JNCASR, Bangalore<br>• Prof. Samik Nanda, IIT Kharagpur<br>• Dr. Akkattu T. Biju, IISc. Bangalore<br>• Dr. Debaraj Mukherjee, CSIR-IIIM Jammu<br>• Dr. Indu Bhushan Deb, CSIR-IICB Kolkata<br>• Dr. Gouriprasanna Roy, IIT Tirupati<br>• Dr. Joyan T. Joseph, Discovery Chemistry, Syngene International, Biocon, Bangalore | 22nd to 26th March 2021 |
| **Online Workshop on "Entrepreneurship Development: Challenges & Opportunities"** | • Prof. Rishikesha T. Krishnan, Indian Institute of Management Bangalore<br>• Prof. Suresh K. Dhameja, NITTTR Chandigarh<br>• Prof. P. Saravanan, Indian Institute of Management Tiruchirappalli | 23rd to 27th March 2021 |

## Paper Presentation / Invited Lecture in Conference / Seminar

| Title of the Paper / Name of the Conference | Name of Faculty Member | Date | Venue |
|---|---|---|---|
| **Paper Presentation entitled "Evidence Building for Ad Click or Web Access on Cloud" & "A hybrid Symmetric Key Cryptography Method to provide Secure Data Transmission"** *in 2nd International Conference on Machine Learning, Image Processing, Network Security and Data Science (MIND-2020)* | Mr. Pankaj Keserwani | 23rd & 24th April 2020 | NIT Silchar |
| **Paper Presentation entitled "A Heuristic approach to detect Web Ad Check Frauds" & "Click droid: A Mythology based on Heuristic approach to detect Web Ad Check Frauds"** *in International Conference on Paradigms of Computing, Communication and Data Science (PCCDS-2020)* | Mr. Pankaj Keserwani | 1st to 3rd May 2020 | NIT Kurukshetra |
| **Paper Presentation entitled "Design and Performance Analysis of FD Silicon on Insulator MOSFET/ 2020"** *in IEEE Students Conference on Engineering & Systems (SCES)* | Dr. Jeetendra Singh | 10 to 12 July 2020 | MNNIT, Allahabad |
| **Paper Presentation entitled "EXTRA: An Extended Radial Mean Response Pattern for Hand Gesture Recognition"** *in 2020 International Conference on Communication and Signal Processing (ICCSP), IEEE* | Mrs. Gopa Bhaumik | 28th to 31st July 2020 | IIT Ropar |
| **Paper Presentation entitled "Automated Algorithm to Determine Design Curves in Parameter Space for Interconnected Converters, 2020"** *in IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC)* | • Dr. Pradeep Kumar<br>• Dr. Kuntal Mandal | 25th & 26th September 2020 | NIT Nagpur |

| Title of the Paper / Name of the Conference | Name of Faculty Member | Date | Venue |
|---|---|---|---|
| **Paper Presentation entitled "CHBMLI Based PVDG System with Improved Power Quality Features and Battery Backup"** *in IEEE First InternationalConference on Smart Technologies for Power, Energy and Control (STPEC)* | Dr. Aurobinda Panda | 25th & 26th September 2020 | NIT Nagpur |
| **Paper Presentation entitled "Comparison of Incremental Current Based MPPT Algorithms for Wind Fed DC Microgrid"** *IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC)* | • Dr. Kuntal Mandal<br>• Dr. Aurobinda Panda | 25th & 26th September 2020 | NIT Nagpur |
| **Paper Presentation entitled "Design of PV Emulator Fed MPPT Controlled DC - DC Boost Converter for Battery Charging"** *IEEE International Conference on Smart Technologies for Power, Energy and Control (STPEC)* | • Dr. Kuntal Mandal<br>• Dr. Molay Roy | 25th& 26th September 2020 | NIT Nagpur |
| **Paper Presentation entitled "Dual-Band Dual Polarized Circularly Polarized and Linearly Polarized L-Shaped Patch Antenna Loaded with Strip and Square Slot"** *In 4th International Conference on Optical & Wireless Technologies (OWT 2020)* | • Dr. Taraknath Kundu<br>• Dr. Sanjay Jana<br>• Mrs. Reshmi Dhara | 3rd October 2020 | MNIT Jaipur |
| **Paper Presentation entitled "A Wideband Monopole Microstrip Antenna Using Two Cross- Shaped Radiator"** *In Socio-Economic and Health Challenges due to COVID-19 and Mitigation Strategies" (SEHCM – 2020)* | Mrs. Reshmi Dhara | 22nd October 2020 | Dr B R Ambedkar National Institute of Technology, Jalandhar |
| **Paper Presentation entitled "Circular Polarized Octal Band CPW- Fed Antenna using Theory of Characteristic Mode for Wireless Communication Applications"** *In Workshop on Machine learning, Deep learning and Computational Intelligence for wireless communication (MDCWC2020)* | Mrs. Reshmi Dhara | 23rd October 2020 | NIT Tiruchirappalli |
| **Paper Presentation entitled "CrossFeat: Multi-scale Cross Feature Aggregation Network for Hand Gesture Recognition"** *In 15th International Conference onIndustrial and Information Systems (ICIIS) 2020. IEEE* | Mrs. Gopa Bhaumik | 26th to 28th November 2020 | AEC, Tamil Nadu |
| **Paper Presentation entitled "P2P Traffic Identification using Machine Learning and Feature Selection Techniques"** *In 26th Annual International Conference on Advanced Computing and Communications, 2020* | Md. Sarfaraj Alam Ansari | 16th to 19th December 2020 | NIT Silchar |
| **Paper Presentation entitled "Att-PyNet: An Attention Pyramidal Feature Network for Hand Gesture Recognition"** *In 26th Annual International Conference on Advanced Computing and Communications, 2020* | Mrs. Gopa Bhaumik | 16th to 19th December 2020 | NIT Silchar |
| **Paper Presentation entitled** A Divide-by-5 Pre-Scaler Design Approach for 5G Applications/ Springer International Conference on Micro/ Nanoelectronics Devices Circuits and Systems (MNDCS 2021) | Dr. Sanjay Kumar Jana<br>Mr. Subhanil Maity<br>Mr. Lokenath Kundu | 29th to 31st January 2021 | NIT Silchar |
| **Paper Presentation entitled "Comparative Power Quality Analysis of SRF and UVT Control based DSTATCOM"** *in International Online Conference on Smart Grid Energy Systems and Control (SGESC-2021)* | Dr. Pradeep Kumar | 19th to 21st March 2021 | NIT Kurukshetra |

| Title of the Paper / Name of the Conference | Name of Faculty Member | Date | Venue |
|---|---|---|---|
| **Paper presentation entitled "Cryptanalysis of an Authentication and Key Management Scheme for Hierarchical IoT Network"** *in International Conference on Advance Computing Applications (ICACA-2021)* | Mr. Uddalak Chatterjee | 27th & 28th March 2021 | Computer Society of India (CSI), Kolkata |
| **"A Circularly Polarized Quad-Band Annular Ring Antenna with Asymmetric Ground Plane Using Theory of Characteristic Modes"** *Students' Research Convention'21 (SRC'21)* | • Prof. M. C. Govil<br>• Dr. Sanjay Jana<br>• Mr. S. Yadav<br>• Mrs. Reshmi Dhara | 28th March 2021 | IIT Kanpur |

## Workshops / Training Attended / Research Work

| Title | Name of the Faculty / Staff | Date | Venue |
|---|---|---|---|
| **Training Program on "Women Empowerment & Prevention of Sexual Harassment"** | • Dr. Sumit Saha<br>• Mrs. Gopa Bhaumik<br>• Ms. Deepika Chettri | 5th October 2020 | Systematic Institute of Economic Research & Development (SIERD) |
| **Training Program on "Right to Information Act"** | • Dr. Dhananjay Tripathi<br>• Mr. Ram Nepal | 6th October 2020 | Systematic Institute of Economic Research & Development (SIERD) |
| **Online training on "Advance Solar Collectors" & "Virtual Experiments in Mechanical Engineering"** | Dr. Kirti Tewari | 19th to 23rd October 2020 & 14th to 18th December 2020 | IIT Guwahati |
| **Online training on "Robotics for 3D printing", "Welding and Additive Manufacturing" & "Virtual Experiments in Mechanical Engineering"** | Mr. Manohar Kumar | 19th to 23rd October 2020, 30th November to 4th December 2020 & 10th to 14th December 2020 | IIT Guwahati |
| **Online training on "Advance Solar Collectors" & "Nanostructure materials and their applications in Nanotechnology"** | Dr. Sukanta Dhar | 26th to 30th October 2020 & 14th to18th December 2020 | IIT Guwahati |
| **Online Training on "Essential Mathematics for Machine Learning with Hands on Training"** | Dr. Amit Kumar Yadav | 23rd to 27th November 2020 | IIT Roorkee |
| **Online training on "Energy Audit for smart grid network"** | Dr. Pradeep Kumar | 30th November to 4th December 2020 | IIT Roorkee |

| Title | Name of the Faculty / Staff | Date | Venue |
|---|---|---|---|
| **Online Workshop on "Examination Reforms Mandate"** | • Dr. Jeetendra Singh<br>• Dr. Avinash Kumar<br>• Dr. Sudipta Das<br>• Dr. Ravi Srivastav<br>• Dr. Prashant Jha<br>• Dr. Suresh Kumar<br>• Dr. Kirti Tewari<br>• Mr. Manohar Kumar<br>• Dr. Debajit Saha<br>• Dr. Marxia Oli Sigo<br>• Dr. Pradeep Kumar<br>• Dr. Amit Kumar Yadav<br>• Mr. Jogi Paul<br>• Mr. Pankaj Kumar Keserwani<br>• Mr. Md. Sarfaraj Alam<br>• Ms. Gopa Bhaumik<br>• Dr. Dooradarshi Chatterjee<br>• Mr. Sumit Kumar<br>• Mr. Rahul Biswas | 4th to 7th December 2020 | NPIU |
| **Online training on "Sustainable Energy Technologies: Synthesis of alternative fuels, characterization and molecular simulations"** | Dr. Sukanta Dhar | 7th to 11th December, 2020 | IIT Roorkee |
| **Online training on "Ergonomics in the Era of Industry 4.0"** | Dr. Dipayan Das | 14th to 18th December 2020 | IIT Guwahati |
| **Online training on "Advance Solar Collectors"** | Dr. Pradeep Kumar | 14th to 18th December 2020 | IIT Guwahati |
| **Online Professional Development Training Program conducted by IIM Raipur** | • Prof. M. C. Govil<br>• Dr. Ranjan Basak<br>• Dr. Anjan Kumar Ray | 8th to 10th February 2021 | IIM Raipur |
| **Online Professional Development Training Program conducted by IIM Trichy** | • Dr. Achintesh N. Biswas<br>• Dr. Shambhunath Barman | 8th to 10th February 2021 | IIM Trichy |
| **Online Professional Development Training Program conducted by IIM Visakhapatnam** | • Dr. Sanjay Kumar Jana<br>• Dr. Sangram Ray<br>• Dr. Sourav Mallick | 9th to 11th February 2021 | IIM Visakhapatnam |

## Conference / Meetings / Program / Short Term Course Attended

| Title | Name of Faculty | Date | Venue |
|---|---|---|---|
| **1st International Conference on Recent Trends in Developments of Thermo - Fluids and Renewable Energy (TFRE-2020)** | Dr. Pradip Mondal | 26th to 28th November, 2020 | NIT Nagaland |
| **Swayam NPTEL Course** | • Dr. Dipayan Das<br>• Dr. Kirti Tewari<br>• Dr. Debajit Saha<br>• Dr. Bibhuti Bhushan Nayak<br>• Mr. Manohar Kumar | 18th January 2021 to 9th April 2021 & 15th February to 9th April 2021. | Online mode |

## Expert Lecture was delivered by Resource Persons from IITs, NITs and other reputed Institutes and Industries mentioned earlier. Apart from those, the following Lectures were also arranged

| Topic | Name of External Expert | Date | Venue |
|---|---|---|---|
| **Faculty Interaction & Lab Visit** | Prof. Sharad Gokhale, IIT Guwahati | 6th February 2021 | Department of Civil Engineering, NIT Sikkim |
| **Expert Lectures on "Professional Practice"** | Prof. Raj Kamal Mittal, IDSE, SAG Director. | 23rd January, 30th January, 20th February & 27th February 2021 | Department of Civil Engineering, NIT Sikkim |
| **Expert Lecture on "Blockchain Technology"** | Dr. Pilli Emmanuel Shubhakar, MNIT Jaipur | 19th November 2020 | Department of Computer Science Engineering, NIT Sikkim |
| **Expert Lectures on "Future Internet Model and Services and Internet of Things for Smart Community Solution"** | Prof. Dhananjay Singh, Hankuk University of Foreign Studies, South Korea | 8th & 9th February 2021 | Department of Computer Science Engineering, NIT Sikkim |

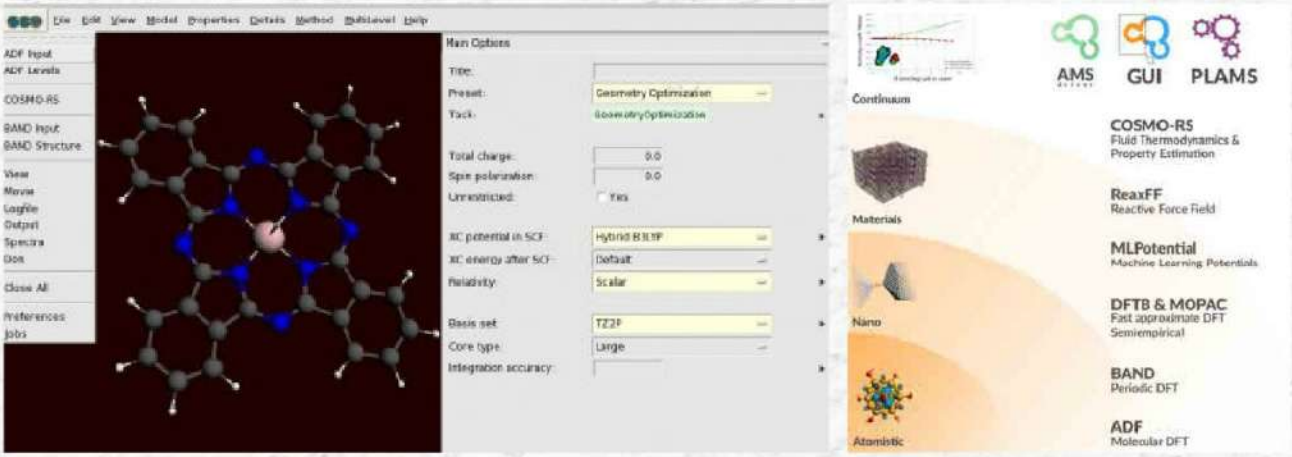
## Other Activities conducted in the Institute

| Title / Type of Activity | Name of External Expert | Date |
|---|---|---|
| **World Heritage Day** | Shri G. P. Upadhyaya, Additional Chief Secretary, Government of Sikkim | 17th & 18th April 2020 |
| **Vetting of Syllabus of Elective Courses** | Prof. A.B. Gupta, MNIT Jaipur | 20th July 2020 |
| **Hindi Pakhwada** | Shri. Rajeev Kumar Rawat, Senior Hindi Officer, IIT Kharagpur & Shri. G. P. Upadhyaya, Additional Chief Secretary, Government of Sikkim | 12th to 17th September 2020 |
| **Vetting of Syllabus of Elective Courses** | Dr. Baboo Rai, NIT Patna | 27th September 2020 |
| **Swachhata Abhiyan** | - | 2nd October 2020 |
| **Vetting of Syllabus of Elective Courses** | Prof. A. Murali Krishna, IIT Tirupati | 14th October 2020 |
| **Vetting of Syllabus of Elective Courses** | Prof. Amiya Samanta, NIT Durgapur | 15th October 2020 & 10th December 2020 |
| **Induction Program 2020** | ◆ Prof. J. P. Singhal, Former Vice Chancellor, University of Rajasthan<br>◆ Prof. C. B. Sharma, Founder & CEO, Dr. CBS Cyber Security Services<br>◆ Prof. M. C. Govil, Director NIT Sikkim<br>◆ Dr. Ranjan Basak<br>◆ Dr. Sangram Ray<br>◆ Dr. Sunder Raj, Director, AARI Vishakhapatnam<br>◆ Dr. Anjan Kumar Ray<br>◆ Dr. Dhananjay Tripathi<br>◆ Prof. Rajat Gupta, Director, NIT Mizoram<br>◆ Prof. Goutam Sutradhar, Director, NIT Manipur | 1st to 5th December 2020 |
| **National Science Day** | Prof. Sankar K. Pal, National Science Chair, Emeritus Professor, Distinguished Scientist and Former Director, Indian Statistical Institute | 28th February 2021 |
| **75th Independence Day "Aazadi Ka Amrit Mahotsav"** | Shri Virendra Pathak, Senior Journalist, ANI News Allahabad | 12th March 2021 |

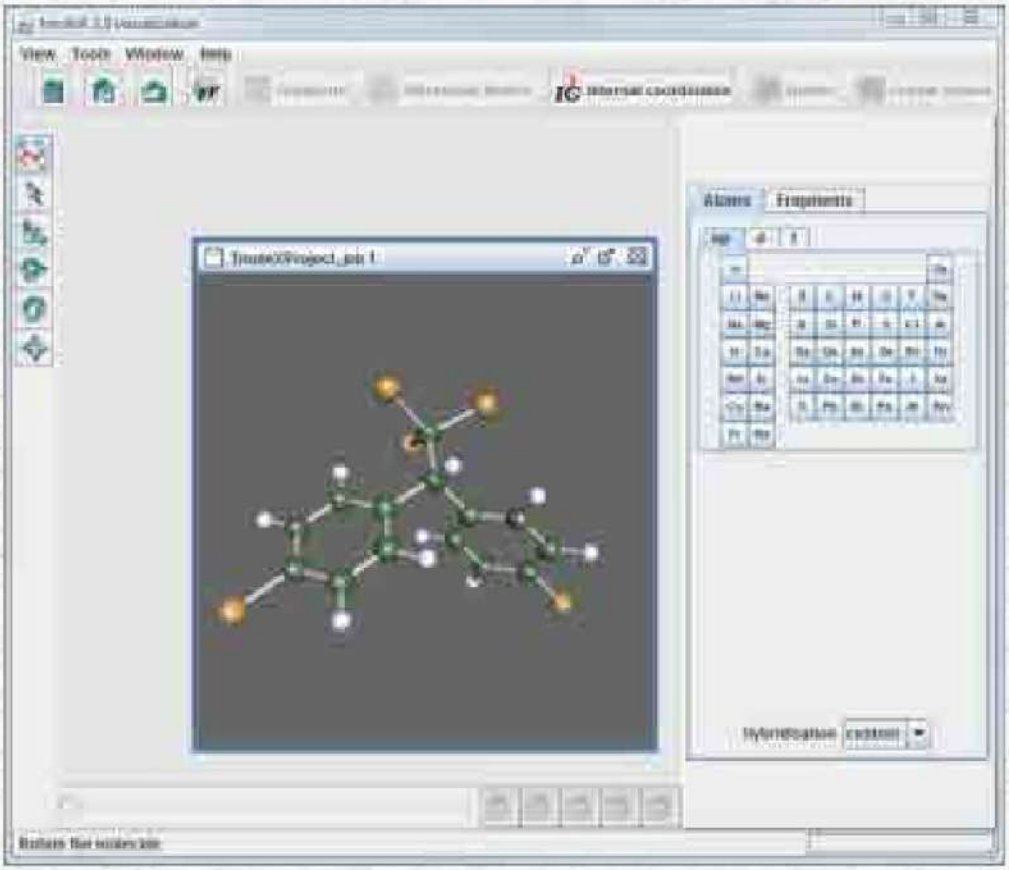
# Procurement under TEQIP-III

## Department of Chemistry

**Amsterdam Modeling Suite (AMS):** A Software used by academia and industries in all areas of Chemistry, Materials Science, and Engineering, the Amsterdam Modeling Suite (AMS) provides a comprehensive set of modules for Computational Chemistry and Materials Science, from Quantum Mechanics to Fluid Thermodynamics.




**Turbomole Software:** A program package for Electronic Structure Calculations containing various features, viz, excited state calculation, structure optimization and molecular dynamics calculations, calculation of various spectroscopic properties.



## Department of Electronics and Communication Engineering

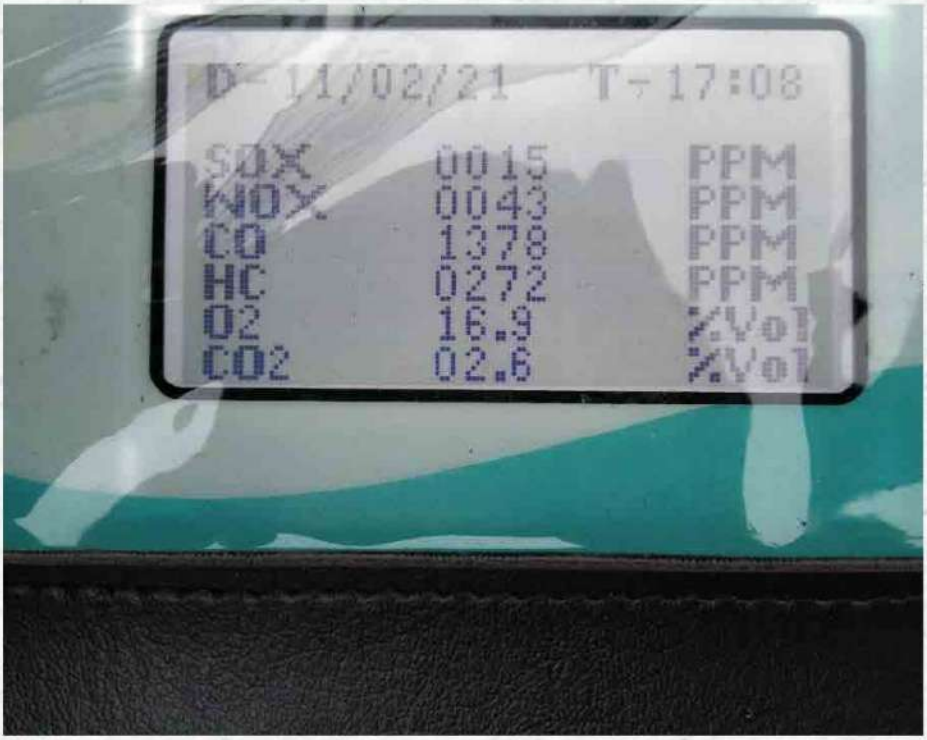
**DSO:** Digital Storage Oscilloscope (DSO) stores and analyses the signals digitally and manipulations are possible at any time because readout memory is available in the DSO. It has an LCD flat panel and able to measures and displays all properties of the waveform.

An Arbitrary Function Generator (AFG) is an instrument that can generate repetitive or single shot signals, which have an arbitrary shape, defined by the user. It can be used to apply a signal to a circuit under test, to test the functionality of that circuit.

## Department of Mechanical Engineering

**Resistance Spot Welding Machine:** It is procured under the financial aids of TEQIP III to conduct the experiments of Casting, Forming and Welding Laboratory of Undergraduate Course.

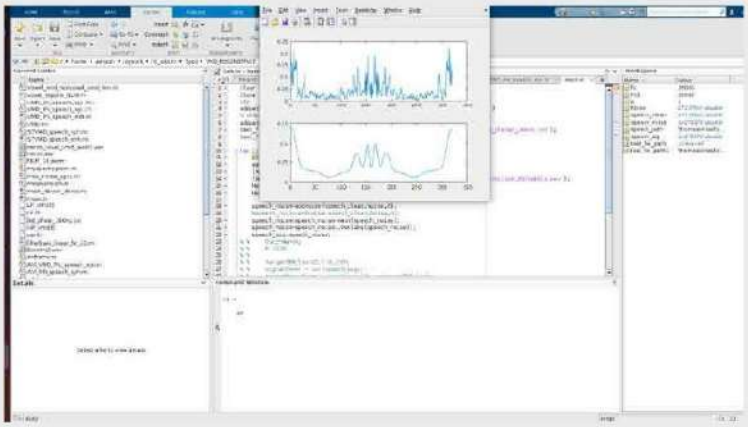
**Flue Gas Analyser:** It is procured to measure the emissions from the existing engines of the IC Engine Laboratory. This instrument will be used to carry out B. Tech projects as well as Ph.D. works.



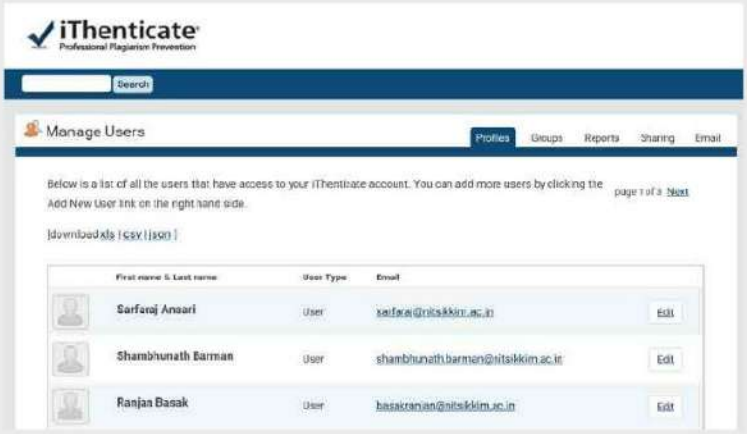
## Department of Electrical and Electronics Engineering

**dSPACE:** dSPACE (DS1104 R&D) Controller Board is important for the students' laboratory classes, hand-on training and project works related to their curriculum, M. Tech. dissertation and Ph.D. research works. Moreover, Faculty Members can also utilize these resources for their Academic and Research activities.

**MATLAB:** It is used for Machine Learning, Signal Processing, Image Processing, Computer Vision, Communications, Computational Finance, Control Design, Robotics, and much more.



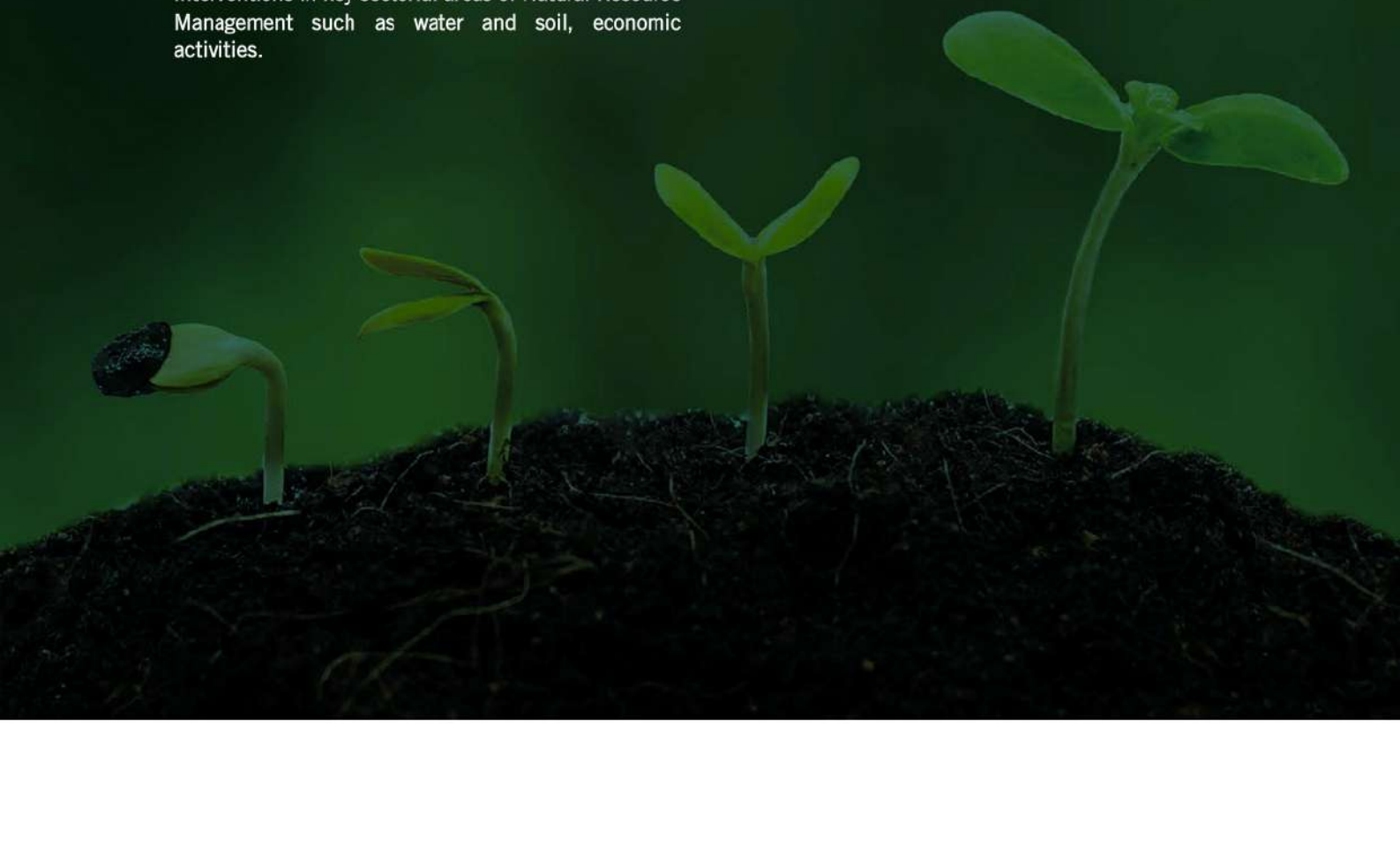
**Turnitin:** Turnitin will help in identifying percentage similarity with online resources before communicating any paper to journals or conferences, reports submitted by the students, thereby ensuring originality of their writings.This will benefit the Institute in the long run in terms of research outcome.



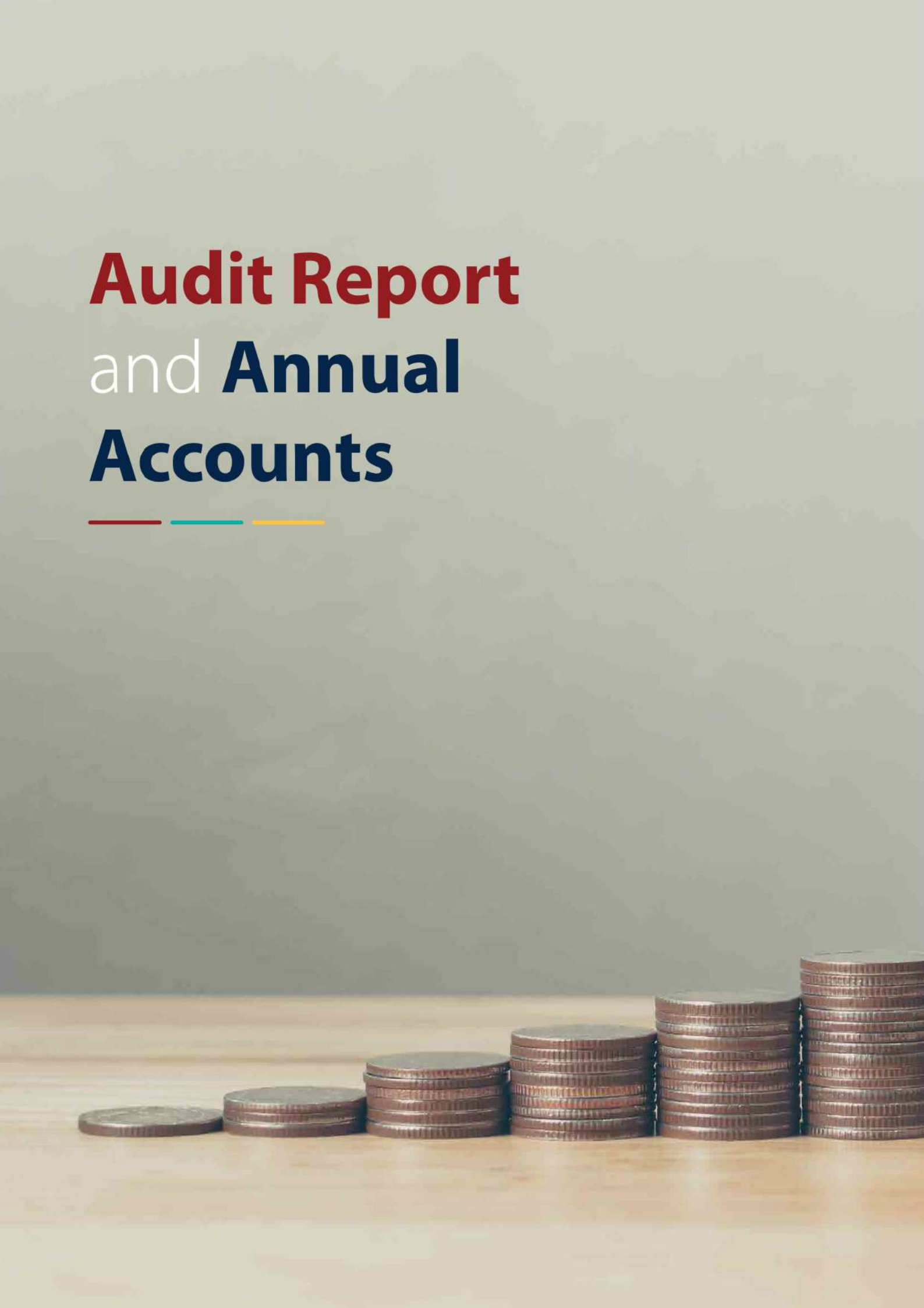
# Community Development and Awareness Programs at NIT Sikkim

NIT Sikkim is actively involved in Community Development and Awareness Programs to ensure development of the community and villages around the campus. Faculty members, staff and students visit nearby villages, schools and surrounding localities to bring awareness about various schemes of Government of India and to ensure sustainable development for the livelihood of the people. Some of the activities undertaken for Community Development and Awareness Programs are mentioned below:

- Meetings with villagers to identify the basic developmental and productive needs of a village. This would help to strengthen the technical design and interventions in key sectorial areas of Natural Resource Management such as water and soil, economic activities.
- Programs to identify efficient, cost effective and sustainable development practices in the field. This will help grassroots organizations in innovating new products, and support rural entrepreneurs to develop neighbourhood solutions. This will empower communities to dialogue with knowledge institutions in order to evolve technically sound and locally feasible development strategies that promote self-reliance.
- To help the villagers to realise the dream of "Adarsh Gram" to improve and establish health and sanitation in villages.



# Audit Report and Annual Accounts




कार्यालय प्र. महालेखाकार , (लेखापरीक्षा )
लेखापरीक्षा भवन, देवराली, सक्किम
गान्तोक – 737 102
**Office of the Pr. Accountant General (Audit),**
**Lekha Pariksha Bhawan, Deorali,**
**Sikkim, Gangtok – 737 102**

No: Comm/NIT/SAR-20-21/21-22/54
Dated: **16 September 2021**

**To,**

**The Director**
**National Institute of Technology**
**Ravangla Campus,**
**Ravangla, Barfung Block**
**South Sikkim- 737139**

**Subject: Forwarding of Separate Audit Report for the year ended 31st March 2021**

Sir

This is to forward herewith the Separate Audit Report on the Accounts of the NIT, Sikkim, Ravangla for the year ended 31 March 2021 for necessary action at your end.

The audited accounts and the Separate Audit Report should be duly considered and adopted by the Institute before the same are placed in both houses of Parliament

Further, the date of laying of the audited accounts/ Separate Audit Report may be intimated to this office. Two copies each of Hindi and English version of the approved annual report may be furnished to this office for onward transmission to the C&AG of India.

The receipt of this letter may kindly be acknowledged.

Yours faithfully,

**Dy. Accountant General**

## SEPARATE AUDIT REPORT ON THE ACCOUNTS OF NATIONAL INSTITUTE OF TECHNOLOGY, SIKKIM FOR THE YEAR ENDED 31 MARCH 2021

We have audited the attached Balance Sheet of National Institute of Technology, Sikkim as on 31 March 2021, the Income & Expenditure Account and Receipts and Payments Account for the year ended on that date under Section 19(2) of the Comptroller and Auditor General's (Duties, Power & Conditions of Service) Act, 1971 read with Section 22(2) of the National Institute of Technology Act, 2007. Preparation of these financial statements is the responsibility of the Institute's Management. Our responsibility is to express an opinion on these Financial Statements based on our audit.

2. This Separate Audit Report contains the comments of the Comptroller and Auditor General of India (CAG) on the accounting treatment only with regard to classification, conformity with the best accounting practices, accounting standards and disclosure norms, etc. Audit observations on financial transactions with regard to compliance with the Law, Rules and Regulations (Propriety and Regularity) and efficiency-cum-performance aspects, etc., if any, are reported through Inspection Reports/CAG's Audit Reports separately.

3. We have conducted our audit in accordance with auditing standards generally accepted in India. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the Financial Statements are free from material misstatements. An audit includes examining, on a test basis, evidences supporting the amounts and disclosure in the Financial Statements. An audit also includes assessing the accounting principles used and significant estimates made by the management, as well as evaluating the overall presentation of Financial Statements. We believe that our audit provides a reasonable basis for our opinion.

4. Based on our audit, we report that:

**i.** We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit;

**ii.** The Balance Sheet, Income and Expenditure Account and Receipts and Payments Account dealt with by this report have been drawn up in the format prescribed by the Ministry of Human Resource Development, Government of India.

**iii.** In our opinion, proper books of accounts and other relevant records have been maintained by the National Institute of Technology Sikkim as required under Section 22(1) of the National Institute of Technology Act, 2007 in so far as it appears from our examination of such books;

iv. We further report that:

**Current Liabilities and Provisions (Schedule 3)**

**Receipts against sponsored project: ₹ 37.79 lakh**

The above is understated by ₹ 16.43 lakh being the amount receivable towards Visvesvaraya fund which is yet to be received. The institute had incurred expenses amounting to ₹ 16.43 lakh under Visvesvaraya fund which is yet to be received from the sponsor. This consequently resulted in understatement of Loans Advances and Deposits (Schedule-8) by ₹ 16.43 lakh.

**B. Grants received during the year from the Government**

The Institute has received ₹ 9.81 crore during the year as grant and pervious year unspent grant was ₹ 8.00 crore. Out of the total available grant of ₹ 17.81 crore, Institute had utilized ₹ 17.81 crore leaving an unspent grant of Nil.

v. Subject to our observation in the preceding paragraphs, we report that the Balance Sheet, Statement of Income & Expenditure Account and Receipt & Payment Account dealt with by this report are in agreement with the books of accounts

vi. In our opinion and to the best of our information and according to the explanations given to us, the said Financial Statements read together with the Accounting Policies and Notes on Accounts, and subject to the significant matters stated above and other matters mentioned in **Annexure-I** to this Audit Report, give a true and fair view in conformity with accounting principles generally accepted in India:

(a) in so far as it relates to the Balance Sheet of the state of affairs of the National Institute of Technology as at 31 March 2021; and

(b) in so far as it relates to the Income & Expenditure Account of the surplus for the year ended 31 March 2021

**For and on behalf of**
**The Comptroller and Auditor General of India**

**Principal Accountant General (Audit)**
**Sikkim, Gangtok**

**Place: Gangtok**
**Date:** 16/09/2021

**ANNEXURE -I**

**1. Adequacy of Internal Audit System:**

The Internal Audit System is commensurate with the size and nature of the Institute

2. **Adequacy of Internal Control System:**

The Internal Control System is commensurate with the size and nature of the Institute

**3. Regularity in payment of statutory dues**

The Management is regular in payment of statutory dues with appropriate authorities.

**4. System of Physical verification of fixed assets/inventories**

The Physical verification of fixed assets/inventories for the year 2019-20 is under progress.

**Place:** Gangtok
**Date:** 16/02/2021

**Principal Accountant General (Audit)**

**Sikkim**

# TEQIP III

# Annual Accounts

# National Institute of Technology Sikkim

## Balance Sheet as at 31st March 2021

Amount in Rupees

| SOURCES OF FUNDS | Schedule No | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **Corpus/ Capital Fund** | 1 | 487,987,705.00 | 479,140,719.00 |
| **Designated/ Earmarked/ Endowment Fund** | 2 | 2,524,641.00 | 1,161,901.00 |
| **Current Liabilities & Provisions** | 3 | 59,542,565.00 | 133,923,439.00 |
| **Total** | | **550,054,911.00** | **614,226,059.00** |
| **APPLICATION OF FUNDS** | | | |
| **Fixed Assets** | 4 | | |
| Tangible Assets | | 239,822,320.00 | 229,133,839.00 |
| Intangible Assets | | 2,698,810.00 | 3,341,810.00 |
| Capital Work in Progress | | 159,944,913.00 | 158,280,121.00 |
| **Investments from Earmarked / Endowment Fund** | 5 | | |
| Long Term | | - | - |
| Short Term | | - | - |
| **Investments-Others** | 6 | - | - |
| **Current Assets** | 7 | 144,386,567.00 | 220,640,725.00 |
| **Loans, Advances and Deposits** | 8 | 3,202,301.00 | 2,829,564.00 |
| **Total** | | **550,054,911.00** | **614,226,059.00** |

| | |
|---|---|
| Significant Accounting Policies | 23 |
| Contingent Liabilities and Notes to Accounts | 24 |

**Date:** 20.08.2021
**Place:** Ravangla, South Sikkim

For, **Sushil Das & Associates**
**Chartered Accountant**

**Krishna Kr. Prasad**
**Partner**

SUSHIL DAS & ASSOCIATES GANGTOK

Director
निदेशक / Director
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

Director

**For and on behalf of National Institute of Technology**

Registrar
कुलसचिव / Registrar
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

Registrar

# National Institute of Technology Sikkim

## Income and Expenditure Account for the Year Ended 31st March 2021

Amount in Rupees

| Particulars | Schedule No | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **INCOME** | | | |
| Academic Receipts | 9 | 28,067,815.00 | 37,577,288.00 |
| Grants/ Subsidies | 10 | 121,818,482.31 | 170,828,916.00 |
| Income from Investments | 11 | 2,958,470.00 | 2,332,277.00 |
| Interest Earned | 12 | 510,769.00 | 5,263,230.00 |
| Other Income | 13 | 2,900,218.60 | 946,438.00 |
| Prior Period Income | 14 | 664,690.00 | 1,143,000.00 |
| **Total (A)** | | **156,920,444.91** | **218,091,149.00** |
| **EXPENDITURE** | | | |
| Staff Payments and Benefits (Establishment Expenses) | 15 | 103,573,649.28 | 99,983,537.00 |
| Academic Expenses | 16 | 5,628,121.00 | 7,043,320.00 |
| Administrative and General Expenses | 17 | 40,524,530.17 | 51,004,224.00 |
| Transportation Expenses | 18 | 741,981.00 | 3,740,509.00 |
| Repairs and Maintainence | 19 | 6,606,419.00 | 6,587,550.00 |
| Finance Costs | 20 | 21,860.00 | 41,202.00 |
| Depreciation | 4 | 44,556,280.00 | 37,875,246.00 |
| Other Expenses | 21 | - | - |
| Prior Period Expenses | 22 | 628,675.00 | 2,428,574.00 |
| **Total (B)** | | **202,281,515.45** | **208,704,162.00** |
| Balance being excess of Income over Expenditure (A-B) | | -45,361,070.54 | 9,386,987.00 |
| Transfer to/ from Designated Fund | | - | - |
| Building Fund | | - | - |
| Other (Specify) | | 2,090,975.00 | - |
| Balance being surplus/deficit carried over to Capital Fund | | -47,452,045.54 | 9,386,987.00 |

| | |
|---|---|
| Significant Accounting Policies | 23 |
| Contingent Liabilities and Notes to Accounts | 24 |

**Date:** 20.08.2021
**Place:** Ravangla, South Sikkim

For, **Sushil Das & Associates**
**Chartered Accountant**

**Krishna Kr. Prasad**
**Partner**

SUSHIL DAS & ASSOCIATES CHARTERED ACCOUNTANTS GANGTOK

Director
निदेशक / Director
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

**For and on behalf of National Institute of Technology**

Director

Registrar
कुलसचिव / Registrar
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

Registrar

# National Institute of Technology Sikkim

## Receipt and Payments Account for the Year Ended 31st March 2021

Amount in Rupees

| Receipts | Current Year 31.03.2021 | Previous Year 31.03.2020 | Payments | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|---|---|
| 1. Opening Balance | | | 1. Expenses | | |
| a) Cash Balances | 14,551.00 | 45,240.00 | a) Establishment Expenses | 95,250,457.00 | 97,964,650.00 |
| b) Cash Balances-Project | 965,736.00 | - | b) Academic Expenses | 4,834,579.00 | 7,043,220.00 |
| c) Bank Balances | | | c) Administrative Expenses | 37,656,475.17 | 49,583,278.00 |
| i) Current Accounts | 33,415,090.00 | 16,417,620.00 | d) Transportation Expenses | 652,732.00 | 3,374,133.00 |
| ii) in Deposit Accounts | 32,887,129.00 | 28,704,769.00 | e) Repiars and Maintainence | 6,606,419.00 | 5,932,820.00 |
| iii) Savings Accounts | 151,362,617.00 | 237,737,103.00 | f) Prior period expenses | - | 30,000.00 |
| iv) Project a/c | - | - | g) Finance Cost | 21,860.00 | 41,202.00 |
| iv) Grant in Transit | - | - | | | |
| 2. Grants received | | | 2. Payments against earmarked/Endowment fund | 2,778,900.00 | 1,092,513.00 |
| a) From Government of India | 98,100,000.00 | 120,000,000.00 | | | |
| b) From Other Sources (Details) (Grants for capital & revenue expenditure to be shown seperately if available) | - | - | | | |
| 3. Academic Receipts | 32,933,981.00 | 34,662,281.00 | 3. Payments against sponsored projects/ Schemes | 6,137,793.83 | 6,499,076.00 |
| 4. Receipts against Earmarked /Endowment fund | 4,108,559.00 | 1,741,250.00 | 4.Payments against sponsored fellowship | - | - |
| 5. Receipts against Sponsored projects/ Schemes | 4,034,633.00 | 5,092,428.00 | 5. Investments and deposits made | | |
| | | | a) Out of Earmarked / Endowment funds | - | - |
| | | | b) Out of own funds | - | - |
| 6. Receipt against sponsored fellowship and scholarship | 747,071.00 | 70,000.00 | 6. Term Deposits with scheduled banks | - | - |
| | | | | | |
| 7. Income on Investments from | | | 7. Refund of Grants | - | - |
| a) Earmarked funds | | | | | |
| | | | **8. Expenditure on Fixed Assets and Intangiable Fixed Assets** | 693,724.00 | - |
| | | | Capital work in progress | 1,664,792.00 | - |
| | | | **Tangible Fixed Assets** | | |
| 8. Interest received on | | | a) Computer and peripherals | 24,415,915.00 | 11,301,209.00 |
| a) Bank Deposits | 2,958,470.00 | 2,332,277.00 | b) Office Equipments | 23,022.00 | 402,032.00 |
| b) Flexi Deposit | 666,245.00 | - | c) Lib Books & Scientific Journals | - | 2,216,951.00 |

# National Institute of Technology Sikkim

## Receipt and Payments Account for the Year Ended 31st March 2021

Amount in Rupees

| Receipts | Current Year 31.03.2021 | Previous Year 31.03.2020 | Payments | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|---|---|
| c) Savings bank account | 2,192,967.00 | 5,263,230.00 | d) Scientific and Lab Equipments | 12,781,841.95 | 617,667.00 |
| | | | e) Plant & Machinery | -213,369.00 | 204,412.00 |
| 9. Investments encashed | - | - | f) Other Fixed Assets | 11,564.00 | 41,997.00 |
| | | | g) Furniture Fixture and Fittings | 493,083.40 | 7,563,483.00 |
| | | | h) Site Development | 920,668.60 | - |
| 10. Term deposits with scheduled banks encashed | - | - | i) Temporary Shed | 5,028,260.66 | 7,141,610.00 |
| | | | j) Audio Visual Equipment | 8,573,153.00 | 2,225,951.00 |
| | | | k) Electrical Installation and Equip. | 129,128.00 | 8,290,756.00 |
| | | | l) Buildings | 294,420.00 | |
| | | | m) Vehicle | 1,450,348.00 | |
| | | | 9. Other payments inc. Statutory payments | 25,477,195.09 | 48,815,449.00 |
| | | | 10. Deposits and advances | 9,551,835.00 | 28,708,955.00 |
| 11.Other Income (Including prior period) | 2,900,218.60 | 2,089,438.00 | | | |
| | | | 11. Other Payments (trf. to CP Fund) | - | 4,984,032.00 |
| 12. Deposits, Debtors and Advances | 5,752,092.00 | 30,387,031.00 | | | |
| | | | 12. Closing Balance | | |
| | | | a) Cash Balances | 3,000.00 | 14,551.00 |
| 13. Miscellaneous recipts including Statutory Receipts | 12,984,097.00 | 25,372,127.00 | b) Bank Balances | | |
| | | | i) Current Accounts | 10,004,406.00 | 33,415,090.00 |
| 14. Caution Money Deposit | 256,000.00 | 2,612,500.00 | ii) in Deposit Accounts | 88,075,435.00 | 32,887,129.00 |
| | | | iii) Savings Accounts | 42,169,944.00 | 151,362,617.00 |
| 15. Any other Receipts | 107,283.00 | 193,225.00 | iv) Project a/c | 899,156.90 | 965,736.00 |
| | | | iv) Grant in Transit | - | - |
| | 386,386,739.60 | 512,720,519.00 | | 386,386,739.60 | 512,720,519.00 |

**Date:** 20.08.2021
**Place:** Ravangla, South Sikkim

For, **Sushil Das & Associates**
**Chartered Accountant**

**Krishna Kr. Prasad**
**Partner**

SUSHIL DAS & ASSOCIATES CHARTERED ACCOUNTANTS GANGTOK

Director
निदेशक / Director
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

Director

**For and on behalf of National Institute of Technology**

Registrar
कुलसचिव / Registrar
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
National Institute of Technology Sikkim

Registrar

# National Institute of Technology Sikkim

## Schedule - 1 : Corpus/ Capital Fund

Amount in Rupees

| SOURCES OF FUNDS | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|
| Balance at the begining of the year | 479,140,718.79 | 361,118,663.79 |
| Add: Contribution towards Corpus/ Capital fund | | |
| Add: Grants from UGC, Government of India and State Government to the extent utilized for Capital Expenditure | 56,266,551.61 | 108,635,068.00 |
| Add: Assets purchased out of Earmarked fund | - | - |
| Add: Assets purchased out of Sponsored Projects, where ownership vests in the institutions | - | - |
| Add: Assets donated/ gifts received | - | - |
| Add: Other Additions | 32,480.00 | - |
| Add: Excess of Income over Expenditure transferred from Income and Expenditure Account | -47,452,045.54 | 9,386,987.00 |
| Balance at the year end | 487,987,704.86 | 479,140,718.79 |

# National Institute of Technology Sikkim

## Schedule - 2 : Designated / Earmarked/ Endowment Fund

Amount in Rupees

| PARTICULARS | | FUNDWISE BREAKUP | | | | | | | | Current Year 31.03.2021 Funds | Previous Year 31.03.2020 (Rs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fund CSAB | Fund DOE & SM Workshop | Fund DASA | Fund CCMT | Fund Sustabnility | Fund C2SD Project | Fund CSTT MHRD | YFRF | | |
| A) | | | | | | | | | | | |
| a) | Opening Balance | 157,685.00 | 4,124.00 | 268,933.00 | - | - | - | -8,841.00 | 740,000.00 | 1,161,901.00 | 480,083.00 |
| b) | Additions during the year | 445,915.00 | | 15,000.00 | 1,435,300.00 | 2,245,425.00 | | - | - | 4,141,640.00 | 1,774,331.00 |
| c) | Income from Investments made of the funds | . | | | | | | | | - | - |
| d) | Accrued interest on Investments/ Advances | | | | | | | | | - | - |
| e) | Interest on Savings Bank A/c | | | | | | | | | - | - |
| f) | Other Additions (Employer contribution) | | | | | | | | | - | - |
| | **Total (A)** | **603,600.00** | **4,124.00** | **283,933.00** | **1,435,300.00** | **2,245,425.00** | **-** | **-8,841.00** | **740,000.00** | **5,303,541.00** | **2,254,414.00** |
| B) | | | | | | | | | | - | |
| | Utilization. Expenditure towards objective of funds | | | | | | | | | - | - |
| i) | Capital Expenditue | . | | | | | | | | - | - |
| ii) | Revenue Expenditue | 603,600.00 | | - | 1,435,300.00 | - | - | - | 740,000.00 | 2,778,900.00 | 1,091,115.00 |
| iii) | Refund | | | | | | - | | | - | 1,398.00 |
| | **Total (B)** | **603,600.00** | **-** | **-** | **1,435,300.00** | **-** | **-** | **-** | **740,000.00** | **2,778,900.00** | **1,092,513.00** |
| | Closing Balances at the year end (A-B) | - | 4,124.00 | 283,933.00 | - | 2,245,425.00 | - | -8,841.00 | - | 2,524,641.00 | 1,161,901.00 |

## Represented by

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cash and Bank Balances | - | 4,124.00 | 283,933.00 | - | 2,245,425.00 | - | | - | 2,524,641.00 | 1,161,901.00 |
| | Investments | | | | | | | | | | |
| | Interest accrued but not due | | | | | | | | | | |
| | **Total** | **-** | **4,124.00** | **283,933.00** | **-** | **2,245,425.00** | **-** | | **-** | **2,524,641.00** | **1,161,901.00** |

# National Institute of Technology Sikkim

## Schedule - 2A : Endowment Fund

Amount in Rupees

| | Name of the Endowment Fund | Opening Balance | | Additions during the year | | Total | | Expenditure on the object during the year | Opening Balance | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Endowment | Accumulated Interest | Endowment | Interest | Endowment | Accumulated Interest | | Endowment | Accumulate Interest | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | | | | | (3+5) | (4+6) | | | | (10+11) |
| A) | | | | | | | | | | | |
| a) | | - | - | - | - | - | - | - | - | - | - |
| b) | | | | | | | | | | | |
| c) | | | | | | | | | | | |
| d) | | | | | | | | | | | |
| e) | | | | | | | | | | | |
| f) | | | | | | | | | | | |

# National Institute of Technology Sikkim

## Schedule - 3 : Current Liabilities And Provisions

Amount in Rupees

| | SOURCES OF FUNDS | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **A** | **CURRENT LIABILITIES** | | |
| 1 | Deposits from Suppliers | 1,221,781.00 | 1,544,863.00 |
| 2 | Deposits from Students | 10,294,971.00 | 8,766,736.00 |
| 3 | **Sundry Creditors** | | |
| a) | For Goods and Services | 5,512,460.00 | 4,744,858.79 |
| b) | Others | 2,872,796.00 | 898,868.71 |
| 4 | Deposit-Others (including EMD, Security Deposit) | 2,719,238.00 | 3,603,662.00 |
| 5 | Statutory Liabilities | 2,414,100.88 | 1,087,556.88 |
| | (GPF,TDS,WC Tax,CPF,GIS, NPS) | | |
| a) | Overdue | - | - |
| b) | Others | 26,146.00 | 24,146.00 |
| 6 | Other Current Liabilities | - | - |
| a) | Salary & Wages | - | - |
| b) | Receipts against Sponsored projects | 3,779,142.27 | 5,882,303.10 |
| c) | Receipts against Sponsored fellowship and scholarship | 284,402.00 | 267,102.00 |
| d) | Unutilised Grants | - | 79,985,033.92 |
| e) | Medical Board Fund | 231,482.00 | 231,482.00 |
| f) | CPF Fund | 411,455.00 | 1,451,572.00 |
| g) | CM Relief Fund | - | 125,078.00 |
| h) | Chief Warden Fund | 6,083,705.42 | 9,149,398.42 |
| i) | Other Liabilities | 521,634.00 | 28,960.00 |
| g) | Alumini Association Fees (2015) | 125,805.00 | 125,805.00 |
| h) | Hostel Mess & Staff Welfare Fund | 1,128,055.00 | 1,128,055.00 |
| i) | Society Fee (2015) | 62,903.00 | 62,903.00 |
| j) | Advance Fees | 4,656,377.00 | 6,633,151.00 |
| k) | Fees Remission Payable | 4,100,117.00 | -7,000.00 |
| l) | Saving Interest payable to Ministry | 2,348,442.60 | - |
| | **Total (A)** | **48,795,013.17** | **125,734,534.82** |
| **B)** | **PROVISIONS** | | |
| 1 | For Taxation | - | - |
| 2 | Gratuity | 6,055,265.00 | 5,092,106.00 |
| 3 | Superannuation Pension | - | - |
| 4 | Accumulated Leave Encashment | 4,692,287.00 | 3,096,798.00 |
| 5 | Trade Warranties/ Claims | - | - |
| 6 | Others (Specify) | - | - |
| | **Total (B)** | **10,747,552.00** | **8,188,904.00** |
| | **Total (A+B)** | **59,542,565.17** | **133,923,438.82** |

# National Institute of Technology Sikkim

## Schedule - 3A : Sponsored Projects

Amount in Rupees

| 1 | 2 | Opening Balance | | 5 | 6 | 7 | Closing Balance | |
|---|---|---|---|---|---|---|---|---|
| Sl No | Name of Project | 3 | 4 | Receipts/ Recovries during the year | Total | Expenditure during the year | | 8 |
| | | Credit | Debit | | | | Credit | Debit |
| 1 | INSPIRE | 1,602,002.00 | | - | 1,602,002.00 | 1,602,002.00 | - | |
| 2 | Others | 295,758.00 | | - | 295,758.00 | - | 295,758.00 | |
| 3 | SERB-T Kundu | 388,584.00 | | - | 388,584.00 | 188,584.00 | 200,000.00 | |
| 5 | SMDP Project | 1,795,895.50 | | 1,017,406.00 | 2,813,301.50 | 1,395,142.23 | 1,418,159.27 | |
| 6 | Visvesvaraya | 661,375.00 | | | 661,375.00 | 2,304,117.00 | -1,642,742.00 | |
| 7 | CSSR Project | - | 23,954.00 | 79,732.00 | 55,778.00 | 55,778.00 | - | |
| 8 | DST - Achintesh Narayan | 123,679.00 | | - | 123,679.00 | 123,596.00 | 83.00 | |
| 9 | UDHD Project | 73,318.00 | | - | 73,318.00 | | 73,318.00 | |
| 10 | DST - ICPS | 509,127.50 | | 361,270.00 | 870,397.50 | 354,913.00 | 515,484.50 | |
| 11 | NMHS Project | 456,518.10 | | 25,725.00 | 482,243.10 | 113,661.60 | 368,581.50 | |
| 12 | CSSR - COVID | - | - | 62,500.00 | 62,500.00 | - | 62,500.00 | |
| 13 | NAMPET | - | - | 2,488,000.00 | 2,488,000.00 | - | 2,488,000.00 | |
| | **Total** | **5,906,257.10** | **23,954.00** | **4,034,633.00** | **9,916,936.10** | **6,137,793.83** | **3,779,142.27** | **-** |

## Schedule - 3B : Sponsored Fellowship and Scholarships

Amount in Rupees

| 1 | 2 | 3 | 4 | 5 | 6 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| Sl. No. | Name of Sponsor | Opening Balance as on 01.04.2020 | | Transactions during the year | | Closing Balance as on 31.03.2021 | |
| | | Credit | Debit | Credit | Debit | Credit | Debit |
| | University Grants Commission | | | | | | |
| | Ministry | | | | | | |
| | Top Class Scholarship for ST | 2,000.00 | - | - | - | 2,000.00 | - |
| | Top Class Scholarship for SC | 262,880.00 | - | - | - | 262,880.00 | |
| | Others Regional states | - | - | - | - | - | |
| | Others (Specify) | 2,222.00 | - | - | - | 2,222.00 | |
| | **Total** | **267,102.00** | | **-** | **-** | **267,102.00** | |

# National Institute of Technology Sikkim

## Schedule - 3C : Unutilised Grant From Ugc, Government of India and State Governments

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **A** | **Plan Grants: Government of India** | | |
| | Balance B/f | 79,985,033.92 | 239,449,017.92 |
| | Add: Receipts during the year | 98,100,000.00 | 120,000,000.00 |
| | Less: Refund | | |
| | Less: Utilized for Revenue Expenditure | 121,818,482.31 | 170,828,916.00 |
| | Less: Utilized for Capital Expenditure | 56,266,551.61 | 108,635,068.00 |
| | **Unutilized Carried ForwardTotal (A)** | - | **79,985,033.92** |
| **B** | **UGC Grant: Plan** | | |
| | Balance B/f | | |
| | Add: Receipts during the year | | |
| | Less: Refund | | |
| | Less: Utilized for Revenue Expenditure | | |
| | **Unutilized Carried ForwardTotal (B)** | | |
| **C** | **UGC Grant: Non Plan** | | |
| | Balance B/f | | |
| | Add: Receipts during the year | | |
| | Less: Refund | | |
| | Less: Utilized for Revenue Expenditure | | |
| | **Unutilized Carried ForwardTotal (C)** | | |
| **D** | **Grants from State Govt.** | | |
| | Balance B/f | | |
| | Add: Receipts during the year | | |
| | Less: Refund | | |
| | Less: Utilized for Revenue Expenditure | | |
| | **Unutilized Carried ForwardTotal (D)** | | |
| | **Total (A+B+C+D)** | - | **79,985,033.92** |

# National Institute of Technology Sikkim

## Schedule - 4 : Fixed Assets

Amount in Rupees

| Sl. No. | Asset Heads | Rate % | Gross Block | | | Depreciation | | | | Net Block | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Op Balance 01.04.2020 | Additions/Deletion | Cl. Balance 31.03.2021 | Op Balance 01.04.2020 | Dep. For the year | Deductions/ Adjustments | Cl. Balance 31.03.2021 | As On 31.03.2021 | As On 31.03.2020 |
| 1 | Land | | - | - | - | - | - | - | - | - | - |
| 2 | Site Development | | 27,771,535.00 | 920,668.60 | 28,692,203.60 | - | - | | - | 28,692,204.00 | 27,771,535.00 |
| 3 | Buildings | 2% | 20,957,344.00 | 294,420.00 | 21,251,764.00 | 4,300,142.80 | 425,035.00 | | 4,725,177.80 | 16,526,586.00 | 16,657,201.00 |
| 4 | Temporary Shed | 33% | 13,859,623.00 | 5,028,260.66 | 18,887,883.66 | 6,790,620.00 | 6,233,002.00 | | 13,023,622.00 | 5,864,262.00 | 7,069,003.00 |
| 5 | Prefab Hostel | 20% | 69,823,000.00 | - | 69,823,000.00 | 13,964,600.00 | 13,964,600.00 | - | 27,929,200.00 | 41,893,800.00 | 55,858,400.00 |
| 6 | Tubewells and Water Supply | 2% | 424,809.00 | - | 424,809.00 | 27,091.00 | 8,496.00 | | 35,587.00 | 389,222.00 | 397,718.00 |
| 7 | Sewerage and Drainage | 2% | - | - | - | - | - | | - | - | - |
| 8 | Electrical Installation and Equip. | 5% | 32,004,122.00 | 129,128.00 | 32,133,250.00 | 7,959,586.00 | 1,606,663.00 | | 9,566,249.00 | 22,567,001.00 | 24,044,536.00 |
| 9 | Plant and Machinery | 5% | 2,977,060.00 | -213,369.00 | 2,763,691.00 | 624,298.10 | 138,185.00 | | 762,483.10 | 2,001,208.00 | 2,352,762.00 |
| 10 | Scientific and Laboratory Equip. | 8% | 38,278,880.00 | 12,781,841.95 | 51,060,721.95 | 14,861,665.55 | 4,084,858.00 | | 18,946,523.55 | 32,114,198.00 | 23,417,214.00 |
| 11 | Office / Mess Equipment | 7.50% | 14,904,822.00 | 23,022.00 | 14,927,844.00 | 6,926,005.08 | 1,119,588.00 | | 8,045,593.08 | 6,882,251.00 | 7,978,817.00 |
| 12 | Audio Visual Equipment | 7.50% | 9,196,168.00 | 8,573,153.00 | 17,769,321.00 | 1,378,026.00 | 1,332,699.00 | | 2,710,725.00 | 15,058,596.00 | 7,818,142.00 |
| 13 | Computer and Peripherals | 20% | 65,632,578.00 | 24,415,915.00 | 90,048,493.00 | 49,815,648.00 | 8,046,569.00 | | 57,862,217.00 | 32,186,276.00 | 15,816,930.00 |
| 14 | Furniture Fixture and Fittings | 7.50% | 47,886,826.00 | 493,083.40 | 48,379,909.40 | 15,925,158.80 | 3,628,493.00 | - | 19,553,651.80 | 28,826,258.00 | 31,961,667.00 |
| 15 | Sports Equipments | 10% | 2,308,679.00 | - | 2,308,679.00 | 1,167,323.45 | 230,868.00 | | 1,398,191.45 | 910,488.00 | 1,141,356.00 |
| 16 | Lib Books & Scientific Journals | 10% | 17,700,792.00 | - | 17,700,792.00 | 13,278,302.00 | 1,770,079.00 | | 15,048,381.00 | 2,652,411.00 | 4,422,490.00 |
| 17 | Vehicle | 10% | 4,738,220.00 | 1,450,348.00 | 6,188,568.00 | 2,312,152.00 | 618,857.00 | | 2,931,009.00 | 3,257,559.00 | 2,426,068.00 |
| 18 | Small Value Assets | 100% | 345,533.00 | 11,564.00 | 357,097.00 | 345,533.00 | 11,564.00 | | 357,097.00 | - | - |
| | **Total (A)** | | **368,809,991.00** | **53,908,035.61** | **422,718,026.61** | **139,676,151.78** | **43,219,556.00** | **-** | **182,895,707.78** | **239,822,320.00** | **229,133,839.00** |
| 19 | Capital Work in Progress - Building | | 144,835,253.00 | 1,664,792.00 | 146,500,045.00 | - | - | | - | 146,500,045.00 | 144,835,253.00 |
| 20 | Capital Work In Progress- Electrical | | 13,444,868.00 | - | 13,444,868.00 | - | - | | - | 13,444,868.00 | 13,444,868.00 |
| | **Total (B)** | | **158,280,121.00** | **1,664,792.00** | **159,944,913.00** | | | | | **159,944,913.00** | **158,280,121.00** |
| 21 | Computer Software | 40% | 4,133,498.00 | 693,724.00 | 4,827,222.00 | 3,727,508.40 | 162,396.00 | | 3,889,904.40 | 937,317.60 | 405,989.60 |
| 22 | E. Journals | 40% | 24,712,542.54 | - | 24,712,542.54 | 21,776,721.85 | 1,174,328.00 | | 22,951,049.85 | 1,761,492.69 | 2,935,820.69 |
| | **Total (C)** | | **28,846,040.54** | **693,724.00** | **29,539,764.54** | **25,504,230.25** | **1,336,724.00** | | **26,840,954.25** | **2,698,810.29** | **3,341,810.29** |
| | **Total (A+B+C)** | | **555,936,152.54** | **56,266,551.61** | **612,202,704.15** | **165,180,382.03** | **44,556,280.00** | **-** | **209,736,662.03** | **402,466,043.29** | **390,755,770.29** |

# National Institute of Technology Sikkim

## Schedule - 4A : Plan

Amount in Rupees

| Sl. No. | Asset Heads | Rate % | Gross Block | | | Depreciation | | | | Net Block | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Op Balance 01.04.2020 | Additions/Deletion | Cl. Balance 31.03.2021 | Op Balance 01.04.2020 | Dep. For the year | Deductions/ Adjustments | Cl. Balance 31.03.2021 | As On 31.03.2021 | As On 31.03.2020 |
| 1 | Land | | - | - | - | - | - | - | - | - | - |
| 2 | Site Development | | 27,771,535.00 | 920,668.60 | 28,692,203.60 | - | - | | - | 28,692,204.00 | 27,771,535.00 |
| 3 | Buildings | 2% | 20,957,344.00 | 294,420.00 | 21,251,764.00 | 4,300,142.80 | 425,035.00 | | 4,725,177.80 | 16,526,586.00 | 16,657,201.00 |
| 4 | Temporary Shed | 33% | 13,859,623.00 | 5,028,260.66 | 18,887,883.66 | 6,790,620.00 | 6,233,002.00 | | 13,023,622.00 | 5,864,262.00 | 7,069,003.00 |
| 5 | Prefab Hostel | 20% | 69,823,000.00 | - | 69,823,000.00 | 13,964,600.00 | 13,964,600.00 | - | 27,929,200.00 | 41,893,800.00 | 55,858,400.00 |
| 6 | Tubewells and Water Supply | 2% | 424,809.00 | - | 424,809.00 | 27,091.00 | 8,496.00 | | 35,587.00 | 389,222.00 | 397,718.00 |
| 7 | Sewerage and Drainage | 2% | - | - | - | - | - | | - | - | - |
| 8 | Electrical Installation and Equip. | 5% | 32,004,122.00 | 129,128.00 | 32,133,250.00 | 7,959,585.00 | 1,606,663.00 | | 9,566,249.00 | 22,567,001.00 | 24,044,536.00 |
| 9 | Plant and Machinery | 5% | 2,977,060.00 | -213,369.00 | 2,763,691.00 | 624,298.10 | 138,185.00 | | 762,483.10 | 2,001,208.00 | 2,352,762.00 |
| 10 | Scientific and Laboratory Equip. | 8% | 38,278,880.00 | 12,781,841.95 | 51,060,721.95 | 14,861,665.55 | 4,084,858.00 | | 18,946,523.55 | 32,114,198.00 | 23,417,214.00 |
| 11 | Office / Mess Equipment | 7.50% | 14,904,822.00 | 23,022.00 | 14,927,844.00 | 6,926,005.08 | 1,119,588.00 | | 8,045,593.08 | 6,882,251.00 | 7,978,817.00 |
| 12 | Audio Visual Equipment | 7.50% | 9,196,168.00 | 8,573,153.00 | 17,769,321.00 | 1,378,026.00 | 1,332,699.00 | | 2,710,725.00 | 15,058,596.00 | 7,818,142.00 |
| 13 | Computer and Peripherals | 20% | 65,632,578.00 | 24,415,915.00 | 90,048,493.00 | 49,815,648.00 | 8,046,569.00 | | 57,862,217.00 | 32,186,276.00 | 15,816,930.00 |
| 14 | Furniture Fixture and Fittings | 7.50% | 47,886,826.00 | 493,083.40 | 48,379,909.40 | 15,925,158.80 | 3,628,493.00 | - | 19,553,651.80 | 28,826,258.00 | 31,961,667.00 |
| 15 | Sports Equipments | 10% | 2,308,679.00 | - | 2,308,679.00 | 1,167,323.45 | 230,868.00 | | 1,398,191.45 | 910,488.00 | 1,141,356.00 |
| 16 | Lib Books & Scientific Journals | 10% | 17,700,792.00 | - | 17,700,792.00 | 13,278,302.00 | 1,770,079.00 | | 15,048,381.00 | 2,652,411.00 | 4,422,490.00 |
| 17 | Vehicle | 10% | 4,738,220.00 | 1,450,348.00 | 6,188,568.00 | 2,312,152.00 | 618,857.00 | | 2,931,009.00 | 3,257,559.00 | 2,426,068.00 |
| 18 | Small Value Assets | 100% | 345,533.00 | 11,564.00 | 357,097.00 | 345,533.00 | 11,564.00 | | 357,097.00 | - | - |
| | **Total (A)** | | **368,809,991.00** | **53,908,035.61** | **422,718,026.61** | **139,676,151.78** | **43,219,556.00** | **-** | **182,895,707.78** | **239,822,320.00** | **229,133,839.00** |
| 19 | Capital Work in Progress - Building | | 144,835,253.00 | 1,664,792.00 | 146,500,045.00 | - | - | | - | 146,500,045.00 | 144,835,253.00 |
| 20 | Capital Work in Progress- Electrical | | 13,444,868.00 | - | 13,444,868.00 | - | - | | - | 13,444,868.00 | 13,444,868.00 |
| | **Total (B)** | | **158,280,121.00** | **1,664,792.00** | **159,944,913.00** | | | | | **159,944,913.00** | **158,280,121.00** |
| 21 | Computer Software | 40% | 4,133,498.00 | 693,724.00 | 4,827,222.00 | 3,727,508.40 | 162,396.00 | | 3,889,904.40 | 937,317.60 | 405,989.60 |
| 22 | E. Journals | 40% | 24,712,542.54 | - | 24,712,542.54 | 21,776,721.85 | 1,174,328.00 | | 22,951,049.85 | 1,761,492.69 | 2,935,820.69 |
| | **Total (C)** | | **28,846,040.54** | **693,724.00** | **29,539,764.54** | **25,504,230.25** | **1,336,724.00** | | **26,840,954.25** | **2,698,810.29** | **3,341,810.29** |
| | **Total (A+B+C)** | | **555,936,152.54** | **56,266,551.61** | **612,202,704.15** | **165,180,382.03** | **44,556,280.00** | **-** | **209,736,662.03** | **402,466,043.29** | **390,755,770.29** |

# National Institute of Technology Sikkim

## Schedule - 4B : Non Plan

Amount in Rupees

| Sl. No. | Asset Heads | Rate % | Gross Block | | | Depreciation | | | | Net Block | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Op Balance 01.04.2020 | Additions/Deletion | Cl. Balance 31.03.2021 | Op Balance 01.04.2020 | Dep. For the year | Deductions/ Adjustments | Cl. Balance 31.03.2021 | As On 31.03.2021 | As On 31.03.2020 |
| 1 | Land | | | | | | | | | | |
| 2 | Site Development | | | | | | | | | | |
| 3 | Buildings | | | | | | | | | | |
| 4 | `Roads and Bridges | | | | | | | | | | |
| 5 | Tubewells and Water Supply | | | | | | | | | | |
| 6 | Sewerage and Drainage | | | | | | | | | | |
| 7 | Electrical Installation and Equip. | | | | | | | | | | |
| 8 | Plant and Machinery | | | | | | | | | | |
| 9 | Scientific and Laboratory Equip. | | | | | | | | | | |
| 10 | Office Equipment | | | | | | | | | | |
| 11 | Audio Visual Equipment | | | | | | | | | | |
| 12 | Computer and Peripherals | | | | | | | | | | |
| 13 | Furniture Fixture and Fittings | | | | | | | | | | |
| 14 | Vehicles | | | | | | | | | | |
| 15 | Library Books & Scientific Journals | | | | | | | | | | |
| 16 | Small Value Assets | | | | | | | | | | |
| | **Total (A)** | | | | | | | | | | |
| 17 | Capital Work in Progress | | | | | | | | | | |
| | **Total (B)** | | | | | | | | | | |
| 18 | Computer Software | | | | | | | | | | |
| 19 | E. Journals | | | | | | | | | | |
| 20 | Patents | | | | | | | | | | |
| | **Total (C)** | | | | | | | | | | |
| | **Total (A+B+C)** | | | | | | | | | | |

# National Institute of Technology Sikkim

## Schedule - 4C : Intangible Assets

Amount in Rupees

| Sl. No. | Asset Heads | Rate % | Gross Block | | | Depreciation | | | | Net Block | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Op Balance 01.04.2020 | Additions/Deletion | Cl. Balance 31.03.2021 | Op Balance 01.04.2020 | Dep. For the year | Deductions/ Adjustments | Cl. Balance 31.03.2021 | As On 31.03.2021 | As On 31.03.2020 |
| 1 | Patents & Copyrights | | - | | | | | | | | |
| 2 | Computer Software | 40% | 4,133,498.00 | 693,724.00 | 4,827,222.00 | 3,727,508.40 | 162,396.00 | | 3,889,904.40 | 937,317.60 | 100,890.00 |
| 3 | E Journals | 40% | 24,712,542.54 | - | 24,712,542.54 | 21,776,721.85 | 1,174,328.00 | | 22,951,049.85 | 1,761,492.69 | 7,016,131.71 |
| 4 | Internet & Lan | 40% | - | - | - | - | - | | - | - | - |
| | **Total (A)** | **40%** | **28,846,040.54** | **693,724.00** | **29,539,764.54** | **25,504,230.25** | **1,336,724.00** | **-** | **26,840,954.25** | **2,698,810.29** | **7,117,021.71** |

## Schedule-4C (i) : Patents and Copyrights

| Sl. No. | Particulars | | Op Balance 01.04.2020 | Additions | Gross | Amortization | Net Block 01.04.2021 | Net Block 01.04.2020 |
|---|---|---|---|---|---|---|---|---|
| A | Patents Granted | | | | | | | |
| 1 | Balance as on 31.03.2014 of patents obtained in Rs.....) | (Original value | | | | | | |
| 2 | Balance as on 31.03.2014 of patents obtained in Rs.....) | (Original value | | | | | | |
| 3 | Balance as on 31.03.2014 of patents obtained in Rs.....) | (Original value | | | | | | |
| 4 | Patents granted during the Current Year | | | | | | | |
| | **Total (A)** | | | | | | | |

| Sl. No. | Particulars | Op Balance 01.04.2020 | Additions | Gross | Amortization | Net Block 01.04.2021 | Net Block 01.04.2020 |
|---|---|---|---|---|---|---|---|
| B | Patents pending in respect of Patents applied for | | | | | | |
| 1 | Expenditure incurred during | | | | | | |
| 2 | Expenditure incurred during | | | | | | |
| 3 | Expenditure incurred during | | | | | | |
| | **Total (B)** | | | | | | |
| | **Grand Total (A+B)** | | | | | | |

# National Institute of Technology Sikkim

## Schedule - 4D : Non Plan

Amount in Rupees

| Sl. No. | Asset Heads | Rate % | Gross Block | | | Depreciation | | | | Net Block | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Op Balance 01.04.2020 | Additions/Deletion | Cl. Balance 31.03.2021 | Op Balance 01.04.2020 | Dep. For the year | Deductions/ Adjustments | Cl. Balance 31.03.2021 | As On 31.03.2021 | As On 31.03.2020 |
| 1 | Land | | | | | | | | | | |
| 2 | Site Development | | | | | | | | | | |
| 3 | Buildings | | | | | | | | | | |
| 4 | `Roads and Bridges | | | | | | | | | | |
| 5 | Tubewells and Water Supply | | | | | | | | | | |
| 6 | Sewerage and Drainage | | | | | | | | | | |
| 7 | Electrical Installation and Equip. | | | | | | | | | | |
| 8 | Plant and Machinery | | | | | | | | | | |
| 9 | Scientific and Laboratory Equip. | | | | | | | | | | |
| 10 | Office Equipment | | | | | | | | | | |
| 11 | Audio Visual Equipment | | | | | | | | | | |
| 12 | Computer and Peripherals | | | | | | | | | | |
| 13 | Furniture Fixture and Fittings | | | | | | | | | | |
| 14 | Vehicles | | | | | | | | | | |
| 15 | Library Books & Scientific Journals | | | | | | | | | | |
| 16 | Small Value Assets | | | | | | | | | | |
| | **Total (A)** | | | | | | | | | | |
| 17 | Capital Work in Progress | | | | | | | | | | |
| | **Total (B)** | | | | | | | | | | |

# National Institute of Technology Sikkim

## Schedule - 5 : Investments from Earmarked Endowment Funds

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| 1 | In Central Government Securities | | |
| 2 | In State Government Securities | | |
| 4 | Other Approved Securities | | |
| 3 | Shares | | |
| 4 | Debenture and Bonds | | |
| 5 | Term Deposit with Banks | | |
| 6 | Others (to be Specify) | | |
| | **Total (A+B+C+D)** | | - |

## Schedule - 5A : Investments from Earmarked Endowment Funds (Fund Wise)

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 4 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| | Endowment Fund Investments | | |
| | **Total** | | |

## Schedule - 6 : Investments-Others

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| 1 | In Central Government Securities | | |
| 2 | In State Government Securities | | |
| 4 | Other Approved Securities | | |
| 3 | Shares | | |
| 4 | Debenture and Bonds | | |
| 5 | Term Deposit with Banks | | |
| 6 | Others (to be Specify) | | |
| | **Total** | | - |

# National Institute of Technology Sikkim

## Schedule - 7 : Current Assets

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **1** | **Stock** | | |
| | a) Stores and Spares | - | - |
| | b) Loose Tools | - | - |
| | c) Publications | - | - |
| | d) Laboratory Chemicals, Comumables and glassware | - | - |
| | e) Building Materials | 1,840,391.00 | 1,588,564.00 |
| | f) Electrical Material | - | - |
| | g) Stationery | - | - |
| | h) Water supply Material | - | - |
| **2** | **Sundry Debtor** | | |
| | a) Debts outstanding for a period of six months | 100,000.00 | 100,000.00 |
| | b) Others | 1,227,654.86 | 307,039.00 |
| **3** | **Cash and Bank Balances** | | |
| | a) With Scheduled Banks | | |
| | - In current account | 10,004,405.93 | 33,415,089.53 |
| | - In term deposit account | 88,075,435.00 | 32,887,129.00 |
| | - In savings account | 43,135,680.19 | 152,328,352.96 |
| | - Grant in Transit | - | - |
| | b) With Non-Scheduled Banks | | |
| | - In term deposit account | - | - |
| | - In savings account | - | - |
| | c) Cash in hand | 3,000.00 | 14,551.00 |
| **4** | **Post Office Savings Account** | - | - |
| | **Total** | **144,386,566.98** | **220,640,725.49** |

# National Institute of Technology Sikkim

## Annexure - A

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| **I)** | **Saving Account** | | |
| 1 | Grants from MHRD A/c | 18,544,137.13 | 127,835,108.00 |
| 2 | University receipts A/c | 15,837,767.70 | 14,299,544.50 |
| 3 | Scholarship A/c | | |
| 4 | Academic Fee Receipt A/c | | |
| 5 | Development (Plan) A/c | | |
| 6 | Combined Entrance Exams (CBT) A/c | | |
| 7 | UGC Plan fellowship A/c | | |
| 8 | Corpus Fund A/c (EMF) | | |
| 9 | Sponsored Projects Fund A/c | 899,156.90 | 965,736.00 |
| 10 | Sponsored Fellowship A/c | | |
| 11 | Endowment & Chair A/c (EMF) | | |
| 12 | UGC JRF Fellowship A/c (EMF) | | |
| 13 | HBA Fund A/c (EMF) | | |
| 14 | Conveyance A/c (EMF) | | |
| 15 | UGC Rajiv Gandhi National Fellowship A/C (EMF) | | |
| 16 | Academic Development Fund A/c (EMF) | | |
| 17 | Deposit A/c (Designated fund) | | |
| 18 | Student Fund A/c | 6,363,163.46 | 7,776,392.46 |
| 19 | Student Aid Fund A/c | | |
| 20 | CPF Account | 1,491,455.00 | 1,451,572.00 |
| **II)** | **Current Account** | 10,004,405.93 | 33,415,089.53 |
| **III)** | **Term Deposit with Schedule Banks** | 88,075,435.00 | 32,887,129.00 |
| | | **141,215,521.12** | **218,630,571.49** |

# National Institute of Technology Sikkim

## Schedule - 8 : Loans, Advances and Deposits

Amount in Rupees

| | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|
| 1 | **Advances to Employees (Non Interest Bearing)** | | |
| | a) Salary | | |
| | b) Festival | | |
| | c) Medical Advance | | |
| | d) Leave Travel Concession | - | - |
| | e) Others (Specify) | 133,358.00 | 391,202.00 |
| 2 | **Long Term Advances to Employees (Interest Bearing)** | | |
| | a) Vehicle Loan | | |
| | b) Home Loan | | |
| | c) Others (Specify) | | |
| 3 | **Advances and other amounts recoverable in cash or In kind or for value to be received** | | |
| | a) On Capital Account | - | - |
| | b) To Suppliers | 10,000.00 | 410,000.00 |
| | c) NIT Calicut | 118,150.00 | 118,150.00 |
| | d) Tax Deducted at Sources | 130,503.00 | - |
| | e) CDAC | - | -193,772.00 |
| | f) Uncleared Cheques | 229,437.00 | 229,437.00 |
| 4 | **Prepaid Expenses** | | |
| | a) Insurance | | |
| | b) Other Expenses (Annual Maintenance Charge) | | |
| 5 | **Deposits** | | |
| | a) Telephone | | |
| | b) Lease Rent | | |
| | c) Electricity | | |
| | d) AICTE, if applicable | | |
| | f) Others (Specify) | | |
| 6 | **Income Accrued** | | |
| | a) On investments from Earmarked/ Endowment fund | | |
| | b) On Investments-Others | | |
| | c) On Loans and Advances | | |
| | d) Others (Includes income due unrealized) | | |
| 7 | **Other-Current assets receivable from UGC /sponsored projects** | | |
| | a) Debit balances in sponsored Projects | | |
| | b) Debit balances in sponsored Fellowship and Scholarship | | |
| | c) Grants receivable | | |
| | d) Other receivable froms from UGC | | |
| 8 | **Claims Receivables** | | |
| | **Total** | **3,202,301.00** | **2,829,564.00** |

# National Institute of Technology Sikkim

## Schedule - 9 : Academic Receipts

Amount in Rupees

| | | | Current Year 31.03.2021 | Previous Year 31.03.2020 |
|---|---|---|---|---|
| **Fees From Students** | | | | |
| **A)** | **Academics** | | | |
| | 1 | Tution Fee | 20,002,080.00 | 21,617,573.00 |
| | 2 | Admission Fee | 130,000.00 | 80,500.00 |
| | 3 | Enrolment Fee | - | - |
| | 4 | Library Fee | 1,019,100.00 | 1,154,900.00 |
| | 5 | Laboratory Fee | - | - |
| | 6 | Art & Craft Fee | - | - |
| | 7 | Registration Fee | 240,450.00 | 232,350.00 |
| | | **Total (A)** | **21,391,630.00** | **23,085,323.00** |
| **B)** | **Examination** | | | |
| | 1 | Admission Fee | - | - |
| | 2 | Annual Examination Fee | 814,500.00 | 726,200.00 |
| | 3 | Marksheet, Certificate Fee | - | - |
| | | **Total (B)** | **814,500.00** | **726,200.00** |
| **C)** | **Other Fees** | | | |
| | 1 | Identity Card Fee | 21,900.00 | 18,400.00 |
| | 2 | Fines/ Miscellaneous fees | 274,036.00 | 433,315.00 |
| | 3 | Medical Fee | 930,300.00 | 1,125,200.00 |
| | 4 | Training & Placement Fees | 201,000.00 | - |
| | 5 | Hostel Fee | 1,939,124.00 | 8,640,650.00 |
| | 6 | Hostel Admission | 78,000.00 | 103,000.00 |
| | 7 | Alumni Fee | - | - |
| | | **Total (C)** | **3,444,360.00** | **10,320,565.00** |
| **D** | **Other Fees** | | | |
| | 1 | Sale of Publication | - | - |
| | 2 | Sale of Admission Form | - | - |
| | 3 | Sale of syllabous, Question paper,etc | - | - |
| | 4 | Sale of prospectus including admission form | - | - |
| | | **Total (D)** | | |
| **E** | **Other Academic Receipts** | | | |
| | 1 | Registration for workshop, programmes | - | - |
| | 2 | Registration for Seminars | - | - |
| | 3 | Developemnt Fee | 963,375.00 | 1,088,250.00 |
| | 4 | Mess Establishment Fee | - | 815,150.00 |
| | 5 | Student Activity Fee | 1,091,750.00 | 1,180,800.00 |
| | 6 | Convocation | 219,000.00 | 200,000.00 |
| | 7 | Others | 143,200.00 | 161,000.00 |
| | | **Total (E)** | **2,417,325.00** | **3,445,200.00** |
| | | **Total (A to E)** | 28,067,815.00 | 37,577,288.00 |

# National Institute of Technology Sikkim

## Schedule - 10 : Grants/ Subsidies (Irrecoverable Grant Received)

Amount in Rupees

| Particulars | PLAN | | | Total | Non Plan | Current Year | Previous Year |
|---|---|---|---|---|---|---|---|
| | Govt. of India | UGC | | Plan | UGC | | |
| | | Plan | Specific Schemes | | | | |
| Balance B/f | 79,985,033.92 | - | - | 79,985,033.92 | - | 79,985,033.92 | 239,449,017.92 |
| Add: Receipts during the year | 98,100,000.00 | | - | 98,100,000.00 | | 98,100,000.00 | 120,000,000.00 |
| **Total** | **178,085,033.92** | **-** | | **178,085,033.92** | | **178,085,033.92** | **359,449,017.92** |
| Less: Refund to UGC | | | | | | | |
| Balance | - | - | - | - | - | - | - |
| Less:Utilized for Capital Expenditure (A) | 56,266,551.61 | | | 56,266,551.61 | | 56,266,551.61 | 108,635,068.00 |
| Balance | 56,266,551.61 | - | - | 56,266,551.61 | - | 56,266,551.61 | 108,635,068.00 |
| Less: Utilized for Revenue Expenditure (B) | 121,818,482.31 | | | 121,818,482.31 | | 121,818,482.31 | 170,828,916.00 |
| Balance C/f (C) | - | - | - | - | - | - | 79,985,033.92 |

# National Institute of Technology Sikkim

## Schedule - 11 : Income from Investments

Amount in Rupees

| Particulars | Earmarked/Endowment Fund | | Other Investments | |
|---|---|---|---|---|
| | Current Year | Previous Year | Current Year | Previous Year |
| 1. Interest | | | | |
| a) Government Securities | | | | |
| b) Other Bonds / Debentures | | | | |
| 2. Interest on Term Deposits | - | | | |
| 3. Income accrued but not due on Term Deposits/ interest bearing advance to employees | | | 2,958,470.00 | 2,332,277.00 |
| 4. Interest on Savings Bank Accounts | - | | - | |
| 5. Others (Specify) | | | | |
| | - - | - | 2,958,470.00 | 2,332,277.00 |
| Transferred to Earmarked/ Endowment Fund | | | | |
| **Balance** | | | **2,958,470.00** | **2,332,277.00** |

## Schedule - 12 : Interest Earned

Amount in Rupees

| | Particulars | Current Year | Previous Year |
|---|---|---|---|
| 1. | On Savings Account with schedule bank | 510,769.00 | 5,263,230.00 |
| 2. | On Loans | | |
| | a) Employees / Staff | | |
| | b) Others | | |
| 3. | Other Debtors and Other Receivables | | |
| | **Balance** | **510,769.00** | **5,263,230.00** |

# National Institute of Technology Sikkim

## Schedule - 13 : Other Income

Amount in Rupees

| Sl. No. | Particulars | Current Year | Previous Year |
|---|---|---|---|
| **A** | **Income from Land and Building** | | |
| 1 | Hostel Room Rent | - | - |
| 2 | License Fee | 60,680.00 | 58,855.00 |
| 3 | Hire Charges of Auditorium/ playground /convention centre etc. | - | - |
| 4 | Electricity Charges recovered | 245,257.37 | 188,357.00 |
| 5 | Water Charges recovered | - | - |
| | **Total (A)** | **305,937.37** | **247,212.00** |
| **B** | **Sale of Institute's publications** | - | - |
| | **Total (B)** | | |
| **C** | **Income from Holding Events** | - | - |
| 1 | Gross receipts from annual function/ sports carnival | - | - |
| | Less: direct expenditure incurred on the annual function /sports carnival | - | - |
| 2 | Gross receipts from fetes | - | - |
| | Less: Direct expenditure incurred on the fetes | - | - |
| 3 | Gross receipts for Educational Tour | - | - |
| | Less: Direct expenditure incurred on the tours | - | - |
| 4 | Others. (Students contribution) | - | - |
| | Total (C) | - | - |
| **D** | **Others** | | |
| 1 | Income from Consultancy | - | 100,000.00 |
| 2 | RTI Fees | 210.00 | - |
| 3 | Income from Royalty | - | - |
| 4 | Sale of application form (Recruitment) | - | 126,350.00 |
| 5 | Misc. Receipts (Sale of tender form, waster paper, etc) | 16,662.00 | 33,658.00 |
| 6 | Profit on sale/ disposal of Assets | - | - |
| | a) Owned Assets | - | - |
| | b) Assets received free of cost | - | - |
| 7 | Grants/ Donations from institutions, welfare bodies and International organizations. | - | - |
| 8 | Recovery of Salary | 9,378.00 | 394,718.00 |
| 9 | PHD Enrollment Fees | 64,400.00 | 33,500.00 |
| 10 | Tender Fees | - | 4,000.00 |
| 11 | Transportation Charges recovered | - | 7,000.00 |
| 12 | Fines & Penalties | - | - |
| 13 | Other Income | - | - |
| 14 | Sale of Scrap | 63,806.00 | - |
| 15 | Overheads from Project | 2,439,825.23 | - |
| | **Total (D)** | **2,594,281.23** | **699,226.00** |
| | **Grand Total (A to D)** | **2,900,218.60** | **946,438.00** |

# National Institute of Technology Sikkim

## Schedule - 14 : Prior Period Income

Amount in Rupees

| | Particulars | Current Year | Previous Year |
|---|---|---|---|
| 1 | Academic Receipts | - | - |
| 2 | Income from Investments | - | - |
| 3 | Interest Earned | - | - |
| 4 | Other Income | 664,690.00 | 63,000.00 |
| 5 | Reversal of Cheques | - | - |
| 6 | Recovery of HRA | - | 1,080,000.00 |
| | **Total** | **664,690.00** | **1,143,000.00** |

## Schedule - 15 : Staff Payments and Benefits (Establishment Expenses)

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| a) | Salaries and Wages | 75,008,764.00 | | 75,008,764.00 | 74,276,486.00 | | 74,276,486.00 |
| b) | Allowances and Bonus | 16,462,077.00 | | 16,462,077.00 | 13,495,174.00 | | 13,495,174.00 |
| c) | Contribution to Provident Fund | - | | - | - | | - |
| d) | Contribution to other fund (NPS) | 5,260,292.28 | | 5,260,292.28 | 5,624,849.00 | | 5,624,849.00 |
| e) | Staff Welfare Expenses | - | | - | - | | - |
| f) | Retirement and terminal benefits | 3,652,256.00 | | 3,652,256.00 | 1,937,188.00 | | 1,937,188.00 |
| g) | LTC Facility | 1,317,676.00 | | 1,317,676.00 | 791,003.00 | | 791,003.00 |
| h) | Medical Facility | 437,111.00 | | 437,111.00 | 704,310.00 | | 704,310.00 |
| i) | Children Education Allowance | 486,000.00 | | 486,000.00 | 349,068.00 | | 349,068.00 |
| j) | Honarium | 17,097.00 | | 17,097.00 | - | | - |
| k) | TA/DA | 820,695.00 | | 820,695.00 | 1,898,784.00 | | 1,898,784.00 |
| l) | Arrear | 7,723.00 | | 7,723.00 | 858,129.00 | | 858,129.00 |
| m) | CPDA to Faculties | 103,958.00 | | 103,958.00 | 48,546.00 | | 48,546.00 |
| | **Total** | **103,573,649.28** | | **103,573,649.28** | **99,983,537.00** | | **99,983,537.00** |

# National Institute of Technology Sikkim

## Schedule - 15A : Employees Retirement and Terminal Benefits

Amount in Rupees

| | Particulars | Pension | Gratuity | Leave Eacashment | Total |
|---|---|---|---|---|---|
| | Opening Balance as on 01.04.2020 | | | | - |
| | Add: Capitilized value of contributions received from other Organizations | | | | |
| | **Total (A)** | | | | |
| | Less: Payments made during the year | | | | - |
| | Balance available as on 31.03.2021 | | | | - |
| | Provisions required on 31.03.2021 as per actrual valuation | | | | - |
| A. | Provision to be made in the current year | - | 1,467,411.00 | 2,184,845.00 | 3,652,256.00 |
| B | Contribution to New Pension Scheme | 5,260,292.28 | | | 5,260,292.28 |
| C | Medical reimbursement to retired employees | | | | - |
| D | Travel to hometown retirement | | | | - |
| E | Deposit Link Insurance payment | | | | - |
| | **Total (A+B+C+D+E)** | **5,260,292.28** | **1,467,411.00** | **2,184,845.00** | **8,912,548.28** |

# National Institute of Technology Sikkim

## Schedule - 16 : Academic Expenses

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| a) | Laboratoy Expenses | 55,971.00 | | 55,971.00 | 183,299.00 | | 183,299.00 |
| b) | Curiculum Development Workshop Expenses | 53,941.00 | | 53,941.00 | 9,609.00 | | 9,609.00 |
| c) | Expenses on Seminars/ Workshops | - | | - | - | | - |
| d) | Payment to visitng faculty | - | | - | - | | - |
| e) | Examination | | | - | - | | - |
| f) | Student Medical Insurance | 891,684.00 | | 891,684.00 | 882,980.00 | | 882,980.00 |
| g) | Admission Expenses | - | | - | 5,640.00 | | 5,640.00 |
| h) | Convocation Expenses | 212,400.00 | | 212,400.00 | 15,037.00 | | 15,037.00 |
| i) | Publications | - | | - | - | | - |
| j) | Stipned/means-cum merit scholarship / PHD Scholarship | - | | - | 189,436.00 | | 189,436.00 |
| k) | Mixed Signal & RF Circuit Design Project | - | | - | - | | - |
| l) | Student hostel fees refund | - | | - | - | | - |
| m) | Acamedic Expenses | 208,181.00 | | 208,181.00 | 198,033.00 | | 198,033.00 |
| n) | Sporting Activities | - | | - | - | | - |
| o) | M.Tech / PHD Fellowship | 3,964,480.00 | | 3,964,480.00 | 3,418,100.00 | | 3,418,100.00 |
| p) | Library Expenses | - | | - | 49,855.00 | | 49,855.00 |
| q) | Cultural Activities | 220,754.00 | | 220,754.00 | 1,277,589.00 | | 1,277,589.00 |
| r) | Registration Charges | - | | - | - | | - |
| s) | Traning & Placement | 20,710.00 | | 20,710.00 | 813,742.00 | | 813,742.00 |
| t) | PHD Scholar Contigency Expenses | - | | - | - | | - |
| u) | Travelling Allowances | - | | - | - | | - |
| | **Total** | **5,628,121.00** | | **5,628,121.00** | **7,043,320.00** | | **7,043,320.00** |

# National Institute of Technology Sikkim

## Schedule - 17 : Administrative and General Expenses

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| **A)** | **Infrastructure** | | | | | | - |
| a) | Electricity and power | 1,203,141.00 | | 1,203,141.00 | 1,474,516.00 | | 1,474,516.00 |
| b) | Water charges | - | | - | - | | - |
| c) | Insurance | - | | - | - | | - |
| d) | Rent, rates and taxes (including property tax) | 6,478,488.00 | | 6,478,488.00 | 6,776,598.00 | | 6,776,598.00 |
| **B)** | **Communication** | - | | - | - | | - |
| e) | Postage and stationery | - | | - | - | | - |
| f) | Telephone, fax and Internet charges | 865,229.17 | | 865,229.17 | 907,751.00 | | 907,751.00 |
| **C)** | **Others** | - | | - | - | | - |
| g) | Printing and Stationery (Consumption) | 366,452.00 | | 366,452.00 | 700,820.00 | | 700,820.00 |
| h) | Travelling and Conveyance Expenses | -42,523.00 | | -42,523.00 | 1,581,845.00 | | 1,581,845.00 |
| i) | Hospitality | 116,530.00 | | 116,530.00 | 95,224.00 | | 95,224.00 |
| j) | Auditors Remuneration | 359,410.00 | | 359,410.00 | 358,200.00 | | 358,200.00 |
| k) | Annual Maintenance Charges | - | | - | - | | - |
| l) | Advertisement and Publicity | - | | - | 75,600.00 | | 75,600.00 |
| m) | BWC Meeting | 49,041.00 | | 49,041.00 | 167,936.00 | | 167,936.00 |
| n) | Office Expenses | 10,072,225.00 | | 10,072,225.00 | 5,826,051.00 | | 5,826,051.00 |
| o) | Honorairum to Outside Experts | 208,000.00 | | 208,000.00 | 175,000.00 | | 175,000.00 |
| p) | Campus Maintainence and House keeping | 16,090,232.00 | | 16,090,232.00 | 20,898,069.00 | | 20,898,069.00 |
| q) | Gardening & Landscape | - | | - | - | | - |
| r) | Security Services and Others | 4,299,762.00 | | 4,299,762.00 | 9,326,623.00 | | 9,326,623.00 |
| s) | Community Development | - | | - | - | | - |
| t) | Medical Centre Expenses | 430,976.00 | | 430,976.00 | 1,496,912.00 | | 1,496,912.00 |
| u) | Computer Centre Expenses | - | | - | - | | - |
| v) | Recuritment Expenses | 23,668.00 | | 23,668.00 | 819,489.00 | | 819,489.00 |
| w) | BOG & FC Meeting | - | | - | 199,667.00 | | 199,667.00 |
| x) | Miscellaneous Expenses | 3,899.00 | | 3,899.00 | 123,923.00 | | 123,923.00 |
| | **Total** | **40,524,530.17** | | **40,524,530.17** | **51,004,224.00** | | **51,004,224.00** |

# National Institute of Technology Sikkim

## Schedule - 18 : Transportation Expenses

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| 1 | Vehicles (Owned by Institutions) | | | | | | |
| a) | Running Expenses | 580,772.00 | | 580,772.00 | 1,126,880.00 | | 1,126,880.00 |
| b) | Insurance Expenses | 161,209.00 | | 161,209.00 | 114,077.00 | | 114,077.00 |
| 2 | Vehicles taken on rent/ lease | | | - | | | - |
| a) | Rent/lease expenses | - | | - | 2,499,552.00 | | 2,499,552.00 |
| 3 | Vehicle (taxi) hiring expenses | - | | - | - | | - |
| | **Total** | **741,981.00** | | **741,981.00** | **3,740,509.00** | | **3,740,509.00** |

## Schedule - 19 : Repairs and Maintainence

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| a) | Buildings | 5,069,578.00 | | 5,069,578.00 | 5,687,969.00 | | 5,687,939.00 |
| b) | Furniture and Fixtures | 156,886.00 | | 156,886.00 | 237,257.00 | | 237,257.00 |
| c) | Plant and Machinery | | | - | | | - |
| d) | Office Equipments | 8,850.00 | | 8,850.00 | 92,584.00 | | 92,584.00 |
| e) | Network/Internet | 47,448.00 | | 47,448.00 | 46,610.00 | | 46,610.00 |
| f) | Construction and Maintanance of Campus | - | | - | 58,672.00 | | 58,672.00 |
| g) | Audio visual equipments | - | | - | - | | - |
| h) | Cleaning materials and services | - | | - | - | | - |
| i) | Book binding charges | - | | - | - | | - |
| j) | Gardening | - | | - | - | | - |
| k) | Estate Maintainence | - | | - | - | | - |
| l) | Others (Hostel Expenses) | - | | - | - | | - |
| m) | Road & Connection repairs | - | | - | - | | - |
| n) | Electrical Maintenance | 1,179,801.00 | | 1,179,801.00 | 94,249.00 | | 94,249.00 |
| o) | Vehicle Maintenance | 143,856.00 | | 143,856.00 | 370,239.00 | | 370,239.00 |
| | **Total** | **6,606,419.00** | | **6,606,419.00** | **6,587,580.00** | | **6,587,580.00** |

# National Institute of Technology Sikkim

## Schedule - 20 : Finance Costs

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Pl an | Non Plan | Total | Plan | Non Plan | Total |
| a) | Bank Charges | 21,860.00 | | 21,860.00 | 41,202.00 | | 41,202.00 |
| b) | Others (specify) | - | | - | - | | - |
| | **Total** | **21,860.00** | | **21,860.00** | **41,202.00** | | **41,202.00** |

## Schedule - 21 : Other Expenses

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| a) | Provision for Bad and Doubtful Debts/Adv. | | | | | | - |
| b) | Irrecoverable balances written off. | | | | | | - |
| c) | Grants/Subsidies to other institutions organisations | | | | | | - |
| d) | Others (specify) | | | | - | | - |
| | **Total** | | | | - | | - |

## Schedule - 22 : Prior Period Expenses

Amount in Rupees

| Sl. No. | Particulars | Current Year | | | Previous Year | | |
|---|---|---|---|---|---|---|---|
| | | Plan | Non Plan | Total | Plan | Non Plan | Total |
| 1 | Establishment Expenses | - | | - | - | | - |
| 2 | Academic Expenses | | | - | | | - |
| 3 | Administrative Expenses | | | - | | | - |
| 4 | Caution Deposit | | | - | | | - |
| 5 | Repairs and Maintainence | - | | - | - | | - |
| 6 | Other Expenses | 628,675.00 | | 628,675.00 | 2,428,574.00 | | 2,428,574.00 |
| 7 | Reversal of Cheques | - | | - | - | | - |
| | **Total** | **628,675.00** | | **628,675.00** | **2,428,574.00** | | **2,428,574.00** |

# National Institute of Technology Sikkim

## Schedule - 23 : Significant Accounting Policies

**1.** The accounts are prepared under Historical Cost Convention unless otherwise stated and generally on the accrual method of accounting.

**2. Revenue Recognition**

2.1 Fees from students (Except tution fee and hostel fee), sales of admission forms, royalty and interest on savings bank account are accounted for on cash basis. Tuition fees and hostel fees collected separately for each semester is accounted for on accrual basis and tuition fees and hostel fee received in advance as on 31st March 2021 has been shown under the head advances as a liability.

2.2 Interest on interest bearing advances to staff for House Building, Purchase of vehicles and computers is accounted on accrual basis every year, though the actual recovery of interest starts after the full repayment of principle.

**3. Fixed Assets and Depreciation**

3.1 Fixed assets are stated at cost of acquisition including inward freight, duties and taxes and incidental and direct expenses related to acquisition, installation and commissioning.

3.2 Gifts / donated assets are valued at the declared value where available; if not available, the value is estimated based on the present market value adjusted with reference to the physical condition of the assets. They are set up by credit to Capital Fund and merged with the Fixed Asset on the Institution. Depreciation is charged as rates applicable to the respective assets.

3.3 Fixed Assets are valued at cost less accumulated depreciation. Depreciation on fixed assets is provided on Straight line method at the following rates:-

| Sl. No. | TANGIBLE ASSETS | RATE |
|---|---|---|
| 1 | Land | 0% |
| 2 | Site Development | 0% |
| 3 | Buildings | 2% |
| 4 | Roads and Bridges | 2% |
| 5 | Tube wells and Water supply | 2% |
| 6 | Sewerage and Drainage | 2% |
| 7 | Electrical Installation and Equip. | 5% |
| 8 | Plant and Machinery | 5% |
| 9 | Scientific and Laboratory Equip. | 8% |
| 10 | Office Equipment | 7.5% |
| 11 | Audio Visual Equipment | 7.5% |
| 12 | Computer and Peripherals | 20% |
| 13 | Furniture Fixture and Fittings | 7.5% |
| 14 | Sports Equipment's | 10% |
| 15 | Library Books & Scientific Journals | 10% |

| Sl. No. | INTANGIBLE ASSETS (AMORTIZATION) | RATE |
|---|---|---|
| 1. | E. Journals | 40% |
| 2. | Computer Software | 40% |
| 3. | Patents | 9 years |

3.4 Depreciation is provided for the whole year on additions during the year.

3.5 Where an assets is fully depreciated, it will be carried at a residual value of Re 1 in the Balance Sheet and will not be further depreciated. Thereafter depreciation is calculated on the additions of each year separately at the rate of depreciation applicable for the asset head.

# National Institute of Technology Sikkim

## Schedule - 23 : Significant Accounting Policies

3.6 Assets created out of Earmarked fund and funds Sponsored Projects, where the ownership of such assets vests in the Institutions are setup by credit to Capital Fund and merged with Fixed Assets of the Institutions. Depreciation is charged at the rates applicable to the respective rates. Assets created out of sponsored project funds where the ownership is retained by the sponsors but held and used by the Institution are separately disclosed in the Notes on Accounts.

The value of Capital Assets is Rs. 24.91 Lakhs as on 31st March 2021 of which the ownership is yet to be transferred.

3.7 Assets, the individual vale of each of which is Rs 2,000.00 or less (except Library Books) are treated as Small Value Assets, 100% depreciation is provided in respect of such assets at the time of their acquisition. However physical accounting and control are continued by the holders of such assets.

### 4. INTANGIBLE ASSETS:-

4.1 Patents and copy rights, E Journals and Computer Software are grouped under Intangible Assets.

4.2 Electronic Journals (E-Journals) are separated from Library Books in view of the limited benefit that could be derived from the provided. E-journals are not in a tangible form, but temporarily capitalized and in view of the magnitude of expenditure and the benefit derived in terms of perpetual knowledge acquired by the Academic and Research Staff; Depreciation is provided in respect of E-journals at a higher rate of 40% as against depreciation of 10% provided in respect of Library Books.

4.3 Expenditure on acquisition of software has been separated from computers and peripherals, as apart from being intangible of obsolescence in respect of these is very high. Depreciation is provided in respect of software at a higher rate of 40% as against depreciation of 20% provided in respect of Computers & Peripherals.

### 5. STOCKS:

Expenditure on purchase of chemicals, glassware, publications and other stores is accounted as revenue expenditure. The closing stock as on 31st March 2021 is Rs. 18,40,391.00

### 6. RETIREMENT BENEFITS

Retirement benefits i.e., New Pension Scheme has been adopted by the Institute for all its regular employees. The director is on deputation from MNIT Jaipur and his retirement benefits are paid to MNIT Jaipur as and when the demand is made by the MNIT Jaipur.

### 7. EARMARKED/ENDOWMENT FUNDS

Funds received for specific purposes have been kept as Earmarked funds. The Receipt and Expenditure are accounted for on cash basis. The unspent balance is kept in the bank account.

#### 7.1. CORPUS/ CAPITAL FUND

A Capital Fund is maintained by the Institute. The fund is made up of the value of grants utilized for the purpose of fixed assets during the year and the excess of income over expenditure as on 31st March.

The balance in the fund which is carried forward is represented by the balance in a separate Bank account, and Fixed Deposits with the Bank and Accrued interest on Fixed Deposits.

### 8. ENDOWMENT FUNDS

There is no endowment fund maintained by the Institute.

### 9 GOVERNMENT AND UGC GRANTS

9.1 Government Grants and UGC grants are accounted on realization basis. However a sanction for release of grant pertaining to the financial year is received before 31st March and the grant is actually received in next financial year, the grant is accounted on accrual basis and an equal amount is shown as recoverable from the Grantor.

# National Institute of Technology Sikkim

## Schedule - 23 : Significant Accounting Policies

9.2 To the extent utilized towards capital expenditure, (on accrual basis) government grants and grants from UGC are transferred to the Capital Fund.

9.3 Government and UGC grants for meeting Revenue Expenditure (on accrual basis) are treated, to the extent utilized, as income of the year in which they are realized.

Unutilized grants (including advances paid out of such grants) are carried forward and exhibited as liability in the Balance Sheet.

### 10. INVESTMENTS OF EARMARKED FUNDS AND INTEREST INCOME ACCRUED

To the extent not immediately required for expenditure, the amounts available against such funds are deposited for fixed term with Banks, leaving the balance in the Savings Bank Accounts

Interest received, interest accrued and due and interest accrued but not due on such funds are not treated as income of the Institution.

### 11. SPONSORED PROJECTS

11.1 In respect of ongoing Sponsored Projects, the amounts received from sponsored are credited to the head "Current Liabilities and Provisions -Current Liabilities -Other Liabilities -Receipts against ongoing sponsored projects" As and when expenditure is incurred /advances are paid against such projects, or the concerned project is debited with allocated overhead charges, the liability account is debited.

11.2 In addition to the Earmarked Fund for the Junior Research Fellowships funded by University Grants Commission, Fellowships and Scholarships are also sponsored by various organizations. These are accounted in the same way as Sponsored Projects except that the expenditure generally is only on disbursement of Fellowship and Scholarships, which may include allowances for contingent expenditure by the Fellows and scholars.

11.3 The Institution itself also awards Fellowships and Scholarships, which are accounted as Academic expenses.

### 12. INCOME TAX

The income of the Institution is exempt from Income Tax under Section 10(23c) (iiiab) of tax is therefore made in the accounts.

# National Institute of Technology Sikkim

## Schedule - 24 : Notes to Accounts

**1.** The 'National Institute of Technology Sikkim' was formed by way of an Act passed by Parliament titled " The National Institutes of Technology Act 2009".

The Financial Statements has been prepared based on the 'format of financial statements for central higher educational institutions' as has been provided by the Ministry of Human Resource Development Department, Government of India.

### 2. TAXATION

The University is exempt from payment of income tax as per the provision of Section 10(23C)(iiiab) of the Income Tax Act, 1961.

### 3. FIXED ASSETS

3.1 Fixed assets are stated at cost of acquisition including inward freight, duties and taxes and incidental and direct expenses related to acquisition, installation and commissioning.

3.2 Capital Expenditure incurred on renovation and construction of new building and structures has been done on land provided by the State Government. The ownership of such land is with the State Government.

### 4. DEPRECIATION

4.1 Depreciation on fixed assets is provided on Straight line method at the following rates:-

| Sl. No. | TANGIBLE ASSETS | RATE |
|---|---|---|
| 1 | Land | 0% |
| 2 | Site Development | 0% |
| 3 | Buildings | 2% |
| 4 | Roads and Bridges | 2% |
| 5 | Tube wells and Water supply | 2% |
| 6 | Sewerage and Drainage | 2% |
| 7 | Electrical Installation and Equip. | 5% |
| 8 | Plant and Machinery | 5% |
| 9 | Scientific and Laboratory Equip. | 8% |
| 10 | Office Equipment | 7.5% |
| 11 | Audio Visual Equipment | 7.5% |
| 12 | Computer and Peripherals | 20% |
| 13 | Furniture Fixture and Fittings | 7.5% |
| 14 | Sports Equipment's | 10% |
| 15 | Library Books & Scientific Journals | 10% |

| Sl. No. | INTANGIBLE ASSETS (AMORTIZATION) | RATE |
|---|---|---|
| 1. | E. Journals | 40% |
| 2. | Computer Software | 40% |
| 3. | Patents | 9 years |

4.3 Depreciation is provided for the whole year on additions during the year.

4.4 Assets, the individual vale of each of which is Rs 2,000.00 or less (except Library Books) are treated as Small Value Assets, 100% depreciation is provided in respect of such assets at the time of their acquisition.

# National Institute of Technology Sikkim

## Schedule - 24 : Notes to Accounts

4.5 The institute has fabricated Temporary Shed whose life expectancy is for three years since the institute is functioning from a temporary campus thus the assets has not been capitalised into additions of Buildings. Accordingly deprecation at rate 33% per annum is charged.

4.6 The institute has built a Prefab Hostel I & II whose life expectancy is for five years since the institute is functioning from a temporary campus thus the assets has not been capitalised into additions of Buildings. Accordingly deprecation at rate 20% per annum is charged.

4.7 A High Performance Computer setup and donated to the institute by CDAC Pune is on trial run and is being currently managed by engineers from CDAC. The asset shall be taken into the assets of the institute after the High Performance Computer is handed over to the institute fully.

**5. RELATED PARTY DISCLOSURE**

| | | |
|---|---|---|
| Name of the Transaction | : | Dr Nidhi Govil |
| Nature of Transaction | : | Visiting Faculty Member – Honorarium |
| Amount | : | Rs. 9,00,000.00 |

**6. CAPITAL COMMITMENT**

Estimated amount of contracts remaining to be executed on capital account and not provided for is Rs. 3.00 Crore (previous year Rs. 5.00 Crore).

**7. CONTINGENT LIABILITY:**

There is no contingent liability as on the date of Balance Sheet.

**8. PROJECT ACCOUNTS**

The project accounts have been shown in the schedules to the Financial Statements and the balance as on 31st March 2021 of each project is taken into consideration under current liabilities.

**9. CURRENT ASSETS, LOANS, ADVANCES AND DEPOSITS**

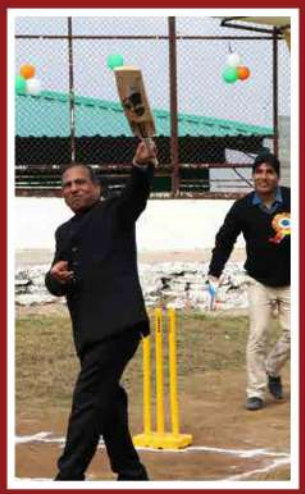
In the opinion of the Management, the current assets, Loans, Advances and Deposits have a value on realisation in the ordinary course, equal at least to the aggregate amount shown in the Balance Sheet.

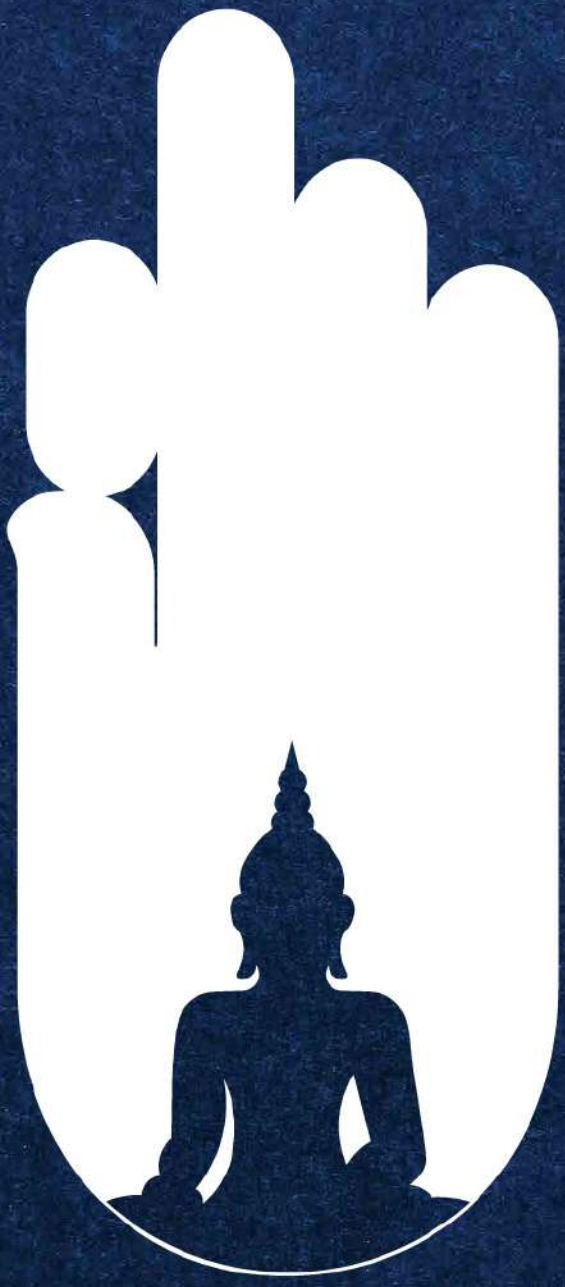
**10.** Schedules I to 24 are annexed to and forms an integral part of the Balance Sheet at 31st March 2021 and the Income and Expenditure account for the year ended on that date.

**11. RE-GROUPING:**

Previous years' figures have been re-grouped and re-arranged wherever necessary

# Republic Day



**National Institute of Technology Sikkim**
राष्ट्रीय प्रौद्योगिकी संस्थान सिक्किम
Barfung Block, Ravangla Sub-division, South Sikkim - 737 139
Director Office : +91 7479013180