



ANNUAL REPORT 2021-22

**NATIONAL INSTITUTE OF TECHNOLOGY MEGHALAYA**

# Annual Report

2021-2022



**National Institute of Technology Meghalaya**

Bijni Complex, Laitumkrah, Shillong 793003



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## The Vision:

A Centre of Excellence vibrant with academic activities and bubbling with youthful creative energy, making significant contribution to the World of Knowledge and Technology and to the Development of the State, the Region and the Nation.

## The Mission:

To impart quality education in the fields of Engineering, Science and Technology at Undergraduate as well as Postgraduate levels with special attention to encourage innovation and creativity in these fields.

To engage in creation of knowledge and development of technologies through effective research programs.



## The Guiding Principles:

- Every entity deserves respect; responsiveness, fairness and transparency are keys to it.
- Role of an academic institution is to enable unhindered exchange of knowledge.
- True education promotes of the spirit of enquiry.
- Nurturing of talent and promotion of creativity must for achieving excellence.
- Learning is a lifelong process.
- Examination and evaluation processes are tools to enable better learning, not the ends.
- Every effort should be made to take the benefit of science and technology to the poor and underprivileged.
- Rural development is must for balanced development of the nation.
- Protection of the environment must get priority.

## The Code of Ethics:

### The Institute follows the IEEE code of ethics for research:

- To accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.
- To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist.
- To be honest and realistic in stating claims or estimates based on available data.
- To reject bribery in all of its forms.
- To improve understanding of technology, it's appropriate application, and potential consequences.
- To maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations.
- To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others.
- To treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin.
- To avoid injuring others, their property, reputation, or employment by false or malicious action.
- To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

# The Institute:

**Permanent Campus Location:** Sohra, East Khasi Hills District, Meghalaya 793108

**Present Location:** Bijni Complex, Laitumkrah, Shillong 793003, Meghalaya

**Website:** <http://nitm.ac.in/>

## The Authorities:

Visitor: Smt. Droupadi Murmu, The Hon'ble President of India

## Board of Governors:

- Shri Sajjan Bhajanka, Chairman
- Prof. B. B. Biswal, Director, NIT Meghalaya, Member
- Addl. Secretary (TE)/ Jt. Secretary (TE), MHRD, Member
- Financial Adviser, MHRD, Member
- Shri W. Roy, MD, Meghalaya Power Carriers (India) Pvt. Ltd, Member
- Shri Medrickson Tariang, Retired Chief Engineer, PWD (Roads), Meghalaya,
- Prof. G. Panda, Professor, Dept. of Electrical Engineering, NIT Meghalaya, Member (upto 08.09.2021)
- Dr. C. Marthong, Associate Professor, Dept. of Civil Engineering, NIT Meghalaya, Member (upto 08.09.2021)

- Prof. H.C. Das, Professor, Dept. of Mechanical Engineering, NIT Meghalaya, Member (w.e.f. 29.09.2021 onwards)
- Dr. P. N. Chatterjee, Associate Professor, Dept. of Chemistry, NIT Meghalaya (w.e.f. 29.09.2021 onwards)
- Director, IIT Guwahati, Member
- Shri B. N. Choudhury, Registrar, NIT Meghalaya, Secretary

## Senate:

- Prof. B. B. Biswal, Director, NIT Meghalaya, Chairman
- Prof. N. C. Shivaprakash, retired Professor, IISc Bangalore, Member.
- Prof. M. K. Paswan, Professor, Department of Mechanical Engineering, NIT Jamshedpur, Member (upto 28.08.2021)
- Prof. R. K. Sahoo, Professor, Department of Mechanical Engineering, NIT Rourkela, Member (upto 21.11.2021)
- Prof. N. Tripathy, Professor, IIM Shillong, Member
- Prof. Mahabir Panda, Professor, NIT Rourkela, Member (w.e.f. 03.12.2021 onwards)

- Prof. G. Panda, Professor, NIT Meghalaya, Member
- Prof. A. Bhattacharjee, Professor, NIT Meghalaya, Member
- Prof. H. C. Das, Professor, NIT Meghalaya, Member
- Shri B. N. Choudhury, Registrar, NIT Meghalaya, Member Secretary

## Finance Committee:

- Shri Sajjan Bhajanka, Chairman
- Director, IIT Guwahati, Member
- Prof. B. B. Biswal, Director, NIT Meghalaya, Member
- Jt. Secretary (TE), MHRD or his nominee, Member
- Finance Adviser, MHRD or his nominee, Member
- Shri W. Roy, MD, Meghalaya Power Carriers (India) Pvt. Ltd, Member
- Prof. H.C. Das, Professor, Dept. of Mechanical Engineering, NIT Meghalaya, Member (w.e.f. 29.09.2021 onwards)
- Shri B. N. Choudhury, Registrar, NIT Meghalaya, Member Secretary

## Building & Works Committee:

- Prof. B. B. Biswal, Director, NIT Meghalaya, Chairman
- Shri. S. Pyngrope, Retd. Secretary to the Govt. of Meghalaya, PWD (R&B), Govt. of Meghalaya, Member
- Shri T. R. Pdah, Addl. Chief Engineer (EZ), MeECL, Shillong, Member
- Shri K. K. Mawa, Superintending Engineer, PWD (Buildings), Govt. of Meghalaya, Member (upto 09.01.2022)
- Shri D. Langstang, Superintending Engineer, PWD (Buildings), PWD (Buildings), Govt. of Meghalaya, Member (w.e.f. 10.01.2022 onwards)
- Dean (Planning & Development), NIT Meghalaya, Member
- Dr. Pares Nath Chatterjee, Associate Professor, Dept. of Chemistry, NIT Meghalaya, Member (w.e.f. 20.05.2021 onwards)
- Shri B. N. Choudhury, Registrar, NIT Meghalaya, Member Secretary



# Administration

<b>Director</b>	
Prof. B. B. Biswal	
<b>Deans:</b>	
Dean (Academic Affairs)	Prof. G. Panda
Dean (Research & Consultancy)	Dr. G. K. Dutta
Dean (Student Welfare)	Dr. A. Banerjee (upto 30.06.2021) Prof. H. C. Das (w.e.f. 01.07.2021 onwards)
Dean (Planning & Development)	Dr. C. Marthong
Dean (Faculty Welfare)	Prof. H. C. Das (upto 30.06.2021) Prof. A. Bhattacharjee (w.e.f. 01.07.2021 onwards)
<b>Professors Incharge:</b>	
Computer Centre	Dr. S. S. Yadav, EC
Centre of International Relations	Dr. M. Saha, MA
Centre for Career Development	Dr. R. S. Das, ME
Centre for Technology Enabled Learning	Dr. P. K. Rathore, EC
Centre for Robotics & Mechatronics	Dr. B. K. Sarkar, ME
Centre for Innovation Incubation & Entrepreneurship	Dr. Ch. V. Rama Rao, EC
Academic Affairs – Postgraduates & Research	Dr. P. Rangababu, EC (upto 30.06.2021) Dr. (Mrs) S. Thokchom (w.e.f. 01.07.2021 onwards)
Academic Affairs – Undergraduates	Dr. V. Pal, CS (upto 30.06.2021) Dr. R. Roy, EE (w.e.f. 01.07.2021 onwards)
<b>Heads of Departments:</b>	
Computer Science & Engineering (CS)	Dr. Yogita
Electronics and Communication Engineering (EC)	Dr. P. Rangababu
Electrical Engineering (EE)	Dr. S. Debbarma
Mechanical Engineering (ME)	Dr. R. N. Mahapatra
Civil Engineering (CE)	Dr. M. L. Patton (upto 30.06.2021) Dr. H. M. Kalita (w.e.f. 01.07.2021 onwards)
Physics (PH)	Dr. (Mrs) A. Nath
Chemistry (CY)	Dr. A. S. Roy (upto 30.06.2021) Dr. N. K. Nath (w.e.f. 01.07.2021 onwards)
Mathematics (MA)	Dr. B. Kumbhakar
Humanities and Social Sciences (HSS)	Dr. P. S. Mangang
<b>Students Activity Centre (SAC):</b>	
President	Dr. P. N. Chatterjee, CY (upto 30.06.2021) Dr. A. K. Paul, CY (w.e.f. 01.07.2021 onwards)
Vice President (Cultural)	Dr. B. Kumbhakar, MA (upto 30.06.2021) Dr. B. K. Debnath, ME (w.e.f. 01.07.2021 onwards)
Vice President (Technical)	Dr. D. Adak, CE
Vice President (Sports & Games)	Dr. Ksh. M. Singh, EE
Faculty i/c of Robotics Club	Dr. B. K. Balabantaray, CS

Faculty i/c of Coding Club	Dr. S. Majumdar, EC
Faculty i/c of Dance & Drama Club	Dr. P. P. Singh, EE
Faculty i/c of Music Club	Dr. S. Moulik, CS
Faculty i/c of Literary Club	Dr. T. Bose, ME
Faculty i/c of Photography & Fine Arts Club	Dr. D. Podder, CE
Faculty i/c of EBSB Club	Dr. A. P. Singh, CS
Member, Technical Committee	Dr. S. K. Bandari, EC
Member, Sports Committee	Dr. A. C. Nayak, PH
Member, Sports Committee	Dr. T. Karmakar, MA
Member, Sports Committee	Dr. A. K. Jena, MA
<b>Hostel administration:</b>	
Chief Warden	Dr. S. Mukherjee, MA (upto 30.06.2021) Dr. A. S. Roy, CY (w.e.f. 01.07.2021 onwards)
<b>Wardens:</b>	
Polo Boys Hostel	Dr. S. Moulik, CS
Kench's Trace Boys Hostel	Dr. B. Balabantaray, CS
Umpling Boys Hostel	Dr. R. Roy, EE (upto 30.06.2021) Dr. A. C. Nayak, PH (w.e.f. 01.07.2021 onwards)
Lapalang I Boys Hostel	Dr. S. Majumdar, EC (upto 30.06.2021) Dr. P. K. Gautam, CE (w.e.f. 01.07.2021 onwards)
Lapalang II Boys Hostel	Dr. A. K. Paul, CY (upto 30.06.2021) Dr. S. K. Bandari, EC (w.e.f. 01.07.2021 onwards)
Lapalang III Boys Hostel	Dr. M. Rahang, ME
Lapalang IV Boys Hostel	Dr. K. Debnath, ME (upto 30.06.2021) Dr. P. K. Saha, EC (w.e.f. 01.07.2021 onwards)
Lapalang V Boys Hostel	Dr. D. Podder, CE
Lower New Colony Boys Hostel	Dr. A. K. Jena, MA
Nongthymmai Girls Hostel	Dr. (Ms) S. Sharma, CE (upto 30.06.2021) Dr. (Mrs) S. S. Devi, EC (w.e.f. 01.07.2021 onwards)
Lapalang Girls Hostel	Dr. (Mrs) S. Sahoo, CE
<b>Registrar's Office:</b>	
Registrar	Shri B. N. Choudhury
Asst. Registrar (Establishment)	Shri B. Blahwar
Asst. Registrar (Academic Affairs)	Smti. A. Rai
Asst. Registrar (Finance & Accounts)	Shri I. Mahesh (upto 29.10.2021) Shri H. Yadav (in-charge w.e.f. 30.10.2021 onwards)
Asst. Registrar (Director's Office)	Shri H. Yadav
<b>Engineering Section:</b>	
Executive Engineer	Shri R. L. Kharpran
<b>Library:</b>	
Asst. Librarian	Dr. R. Kharbihkiew

# THE DIRECTOR'S REPORT

The National Institute of Technology Meghalaya is currently operating from its temporary campus at Bijni Complex, Laitumkhrah, Shillong. The Institute has completed eleven years since its establishment in the year 2010. During the year 2021-22, the Institute has made many significant strides.

## I) Academic Section:

The functioning of Academic Section is headed by Dean (Academic Affairs) and assisted by Professors-in Charge

### People under Academic Section:

**Prof. Gayadhar Panda**  
Dean (Academic Affairs)

**Dr. S. Thockchom**  
PIC (AA, PG&R)

**Dr. Rakesh Roy**  
PIC (AA, UG)

**Mrs. Ambika Rai**  
Assistant Registrar (Academic Affairs)

**Ms. Pragya Yadav**  
Superintendent (Academic Affairs) (w.e.f. 25.3.2022)

(PIC-UG & PIC-PG&R), Assistant Registrar (Academic Affairs), Superintendent, and Junior Assistants. The Section performs all the functions related to Academics of the Institute. It also provides administrative support to the Senate, which is the highest academic body of the Institute.

**Mr. Manfred E. Kurbah**  
Junior Assistant

**Mr. Banshailang Myrthong**  
Junior Assistant

**Mr. Julius lawphniaw**  
Junior Assistant

**Mr. Bankerlang Lyngdoh**  
Junior Assistant (w.e.f. 23.3.2022)

## II) Programmes offered by the Institute:

**1) Under Graduate Programme:** The Institute offers B.Tech (Bachelors of Technology) Programme in the following five disciplines:

- Civil Engineering (CE)
- Computer Science and Engineering (CSE)
- Electronics and Communication Engineering (ECE)

- Electrical Engineering (EE)
- Mechanical Engineering (ME)

**2) Post Graduate Programmes:** The Institute offers Master of Technology (M.Tech) and Master of Science (M.Sc) as PG Programmes in the following disciplines:

- Master of Technology (M.Tech) Programme**
  - Civil Engineering (Structural Engineering) [CE]

- Computer Science and Engineering [CSE]
- Electronics and Communication Engineering (VLSI & Embedded system) [ECE]
- Electrical Engineering (Power and Energy Systems) [EE]
- Mechanical Engineering (Fluids and Thermal Engineering) [ME]

**b) Master of Science (M.Sc.) Programme:**

- Physics (PH)
- Chemistry (CY)
- Mathematics (MA)

**3) Doctor of Philosophy (Ph.D) Programme:** This is offered with an objective to undertake quality researches for innovations and new technological developments. The Institute is currently offering Ph.D Programme in the

following disciplines under both Full Time and Sponsored (Part-Time) Categories.

- Engineering
- Basic Sciences
- Humanities & Social Sciences (HSS)

**4) Post-Doctoral Fellowship Scheme:** The Post-Doctoral Fellowship Programme aims to identify and motivate young researchers and provide them support for research in frontier areas of science and engineering. The Institute is currently offering Institute Post-doctoral Fellows (IPDFs) and Sponsored Post-doctoral Fellows (SPDFs) under the following disciplines.

- Engineering
- Basic Sciences
- Humanities & Social Sciences (HSS)

## III) Admissions to the various Programmes during 2021-22

- Admission to the Bachelor of Technology Programme (B.Tech) was conducted on the basis of valid JEE Main scores and through the joint seat allocations made by Joint Seat allocation Authority (JoSSA)/CSAB.
- Admission to the Master of Technology (M. Tech) Programme in the Institute was conducted on the basis of valid GATE scores and through the counseling conducted by the Centralized Counseling for M. Tech. / M. Arch. / M. Plan (CCMT).
- Admission to Master of Science (M.Sc.) Programme was conducted on the basis of valid JAM scores and through

Centralized Counselling CCMN. However, vacant seats after CCMN counseling were filled through Institute entrance examination.

- Admission to the Ph.D Programme was conducted based on the written examination, viva-voce or presentations. The advertisement for the same was published during March 2021 for Autumn 2021 session and in November 2021 for Spring 2022 session.
- Admissions to various Programmes during the year were successfully conducted.

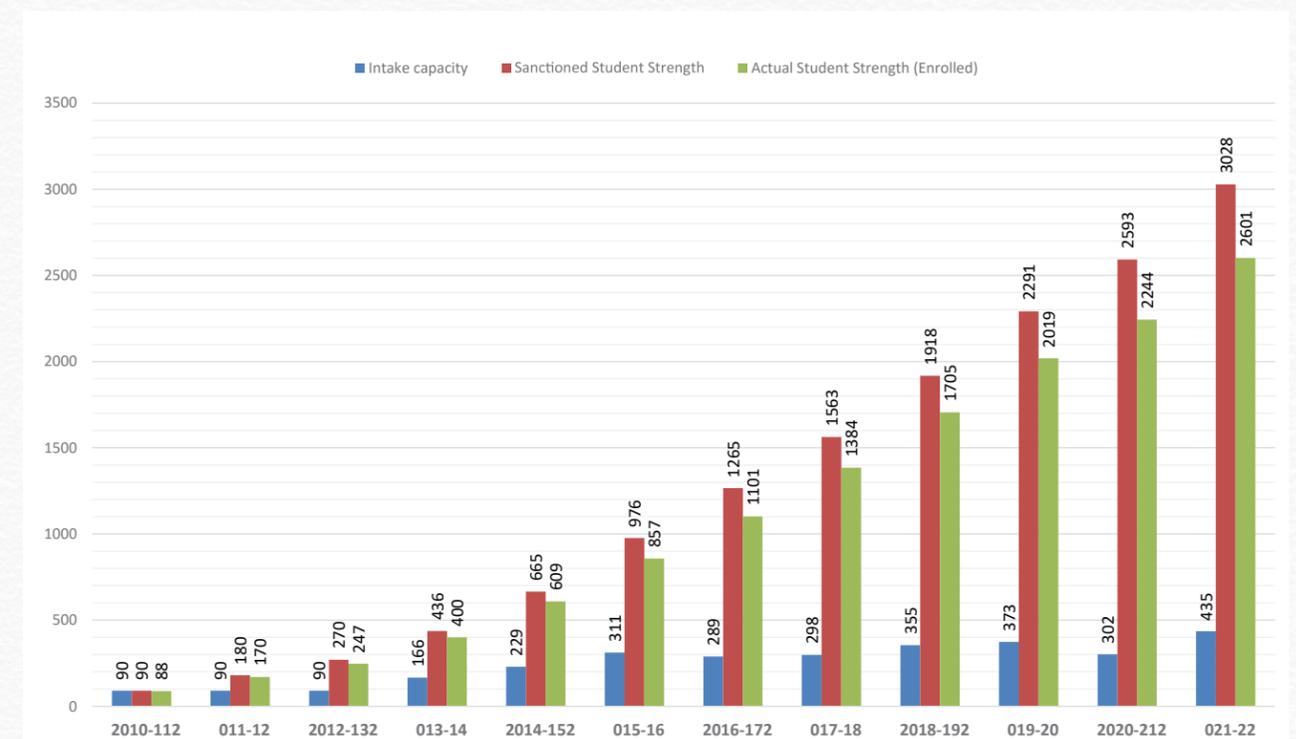


## IV) Student's Data upto 2021-22

### Admitted in 2021-22

Programme	Discipline	Intake Capacity	Male	Female	SC	ST	OBC	Total
B.Tech.	CE	33	29	7	3	16	6	36
	CS	33	26	7	4	12	6	33
	EC	33	25	7	2	13	6	32
	EE	33	26	7	2	15	9	33
	ME	33	21	10	4	14	6	31
	<b>Sub Total</b>		165	127	38	15	70	33
M.Tech.	CE	20	12	3	2	2	2	15
	CSE	20	6	0	2	2	0	6
	ECE	20	2	1	1	0	1	3
	EE	20	3	0	0	1	1	3
	ME	20	0	0	0	0	0	0
	<b>Sub Total</b>		100	23	4	5	5	4
M.Sc.	PH	16	11	5	2	1	5	16
	CY	16	6	9	1	2	6	15
	MA	16	6	6	3	3	2	12
	<b>Sub Total</b>		48	23	20	6	6	13
Ph.D.	CE	NA	12	4	2	5	1	16
	CSE	NA	18	8	3	2	2	26
	ECE	NA	15	11	0	3	14	26
	EE	NA	16	2	2	1	6	18
	ME	NA	17	2	0	1	5	19
	PH	NA	3	1	0	0	1	4
	CY	NA	5	4	0	0	3	9
	MA	NA	0	2	0	0	0	2
	<b>HSS</b>	NA	1	1	0	2	0	2
<b>Sub Total</b>	NA	87	35	7	14	32	122	
<b>Total</b>			<b>260</b>	<b>97</b>	<b>33</b>	<b>95</b>	<b>82</b>	<b>357</b>

## Student Strength



A total of 357 students were admitted during the Academic Year 2021-22, including the Ph. D scholars

## V) Major Events

**1) Eighth Convocation:** The Eighth Convocation of the Institute was held on 1st October, 2021 via online mode. Shri. Dharmendra Pradhan, Hon'ble Minister of Education, Skill Development & Entrepreneurship, Government of India graced the occasion as the Chief Guest. Prof. K. K. Aggarwal, Chairman, National Board of Accreditation, was the Guest of Honour. Shri Sajjan Bhajanka, Chairman,

Board of Governors of the Institute, was the Chairman of the Convocation. The eighth batch of B. Tech, sixth batch of M. Tech, fifth batch of M.Sc and Ph.D scholars of the Institute graduated in June, 2021. The students who graduated under the different programmes are presented below: -

Sl. No.	Name of the Pogramme	Number of the Students Graduated	Out of
1	B.Tech	124	136
2	M.Tech	37	40
3	M.Sc	34	34
4	Ph.D	19	19
	<b>Total</b>	<b>214</b>	<b>229</b>

Most of the qualified students were placed in reputed companies through Campus Placement.



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)



(8th Convocation: Dated 1/10/2021)

**2) Research Conclave:** The 3rd Research Conclave 2022 of NIT Meghalaya was held during 28th Feb – 1st March 2022. The inauguration ceremony was graced by Prof. Nalin Mehta (Director, NEIGRIHMS), Shri. Calvin Harris Kharshing (IA&AS, Planning Adviser, NEC), Prof. Bibhuti Bhusan Biswal (Director, NIT Meghalaya), Prof. Gayadhar Panda (Dean, Academic Affairs, NIT Meghalaya) and Dr. Gitish Kishore Dutta (Dean, Research & Consultancy, NIT Meghalaya).

Five eminent speakers, Prof. Bidyadhar Subudhi (IIT Goa), Prof. Bhagirathi Panda (Honorary Director, ICSSR NERC), Dr. Archana Sharma (BARC Mumbai), Prof. Vasant Matsagar (IIT Delhi) and Prof. Srubabati Goswami (Physical

Research Laboratory- PRL) delivered informative talks during the conclave.

Overall 114 young research scholars from NIT Meghalaya, NEHU, NIT Silchar, NIT Agartala, Tezpur University, IIIT Guwahati, Assam University, CIT Kokrajhar, IIT Kharagpur, IIT Delhi, IIT Bombay, NIT Karnataka, NIT Durgapur, NIT Warangal, BHU Varanasi, and Jaypee Institute of Information Technology Noida showcased their research work in the form of poster presentations and paper presentations in hybrid mode in Engineering and Science & Humanities categories. There were 14 internal and 5 external panel members to evaluate the technical events.

Award		Name	Department
<b>Institute Best Research Award</b>		Susmay Nandi	MA, NITM
<b>Oral Paper Presentation</b>	<b>Engineering Discipline</b>	1st Prize	Siddhartha Deb Roy
		2nd Prize	Abhinandan Kalita
		3rd Prize	P. Venkaiah
	<b>Science and Humanities Discipline</b>	1st Prize	Gulshan Kumar Yadav
		2nd Prize	Bhavana Barman
		3rd Prize	Abhibasu Sen
<b>Poster Presentation</b>	<b>Engineering Discipline</b>	1st Prize	Nihar Ranjan Pradhan
		2nd Prize	Jerry W Sangma
		3rd Prize	Kaushik Ray
	<b>Science and Humanities Discipline</b>	1st Prize	Onus Manner
		2nd Prize	Sharat Sarmah
		3rd Prize	Mahabul Haque



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )



(3rd Research Conclave: Dated 28/2/2021 & 01/3/2022 )

## VI) Notable Achievements of the Institute:

- 1) NIT Meghalaya has been placed at 59th in the NIRF rankings for 2021.
- 2) NIT Meghalaya has been ranked 26th by India Today Ranking in 2021.
- 3) Best Institute in North East 2021 by CEGR (Centre for Education Growth and Research).
- 4) The Mechanical Engineering and the Electrical & Electronics Engineering Programmes of the Institute has been accredited by NBA for the Academic Years 2021-2022 to 2022-2024, i.e., up to 30-06-2024

## VII) Notable Achievements of the Students

The notable achievements of the students in the filed of academics/research during the year 2021-22 are presented below:

- 1) Ms. Ankita Bhowmick, Research scholar, HS Dept., received the best presenter award in the International Conference on 'Gender Studies and Women Empowerment' organized by NIT Agartala during 16-18 April 2021.
- 2) Ms. Ankita Bhowmick, Research scholar, Humanities and Social Sciences Dept., received the best presenter award in the National Conference on 'Literature, Language, and Culture of North East India' organized by NIT Meghalaya, EFLU Shillong, and Spectrum Journal on 19th & 20th November 2021.
- 3) Ms. Arundhati Ashangbam, Research Scholar, Humanities and Social Sciences Dept., received the best presenter award in National Symposium on Reading and Interpreting Literature, organised by Dept of English, Highland National College, Kanglatombi, Manipur and Spectrum Journal.

- 4) Mr. Vasujeet Singh, Research Scholar, Mechanical Engineering Dept., received Best Paper Presentation award in 2nd International Conference on Recent Advances in Mechanical Engineering Research and Development, ICRAMERD-2021, organised by SOA University, Bhubaneswar, Odisha on 24-25 September 2021.

## VIII) Financial Assistance to the Students

The Institute provides full exemption of tuition fees to students belonging to SC, SC & PH categories. Apart from that, full tuition fee remittance is provided to students whose annual family income is lesser than one lakh. The students with annual family income of lesser than *five lakhs* are remitted with *2/3rd of the tuition fees* as per MHRD guidelines from 2016 onwards. All the Ph.D /M.Tech/M.Sc students are receiving scholarships from Institute funds as per norms as well as from different funding agencies. The Outstanding Research Fellowship Scheme (ORFS) is targeted to encourage the Institute Ph. D scholars to set an outstanding research record. This may provide an opportunity for the scholars to carry out further research in the particular domain and also motivates the scholars for completing Ph.D work with substantial research publications in time. In 2021-22, five (5) Ph.D scholars were selected for this scheme.

# STUDENTS' PLACEMENT

Placement activities are an integral part of National Institute of Technology Meghalaya and the activities were carried out during the year by the Centre for Career Development. The objective of the Centre is to make each and every student of NIT Meghalaya a success story and to impart legendary leadership qualities to all the students. It not only ensures that the graduation outcome of the student is a fruitful and upright one, but also helps that the students to develop into a complete human being with the perfect combination of professional and business ethics while still maintaining the values within themselves. Just like the previous years, the

placement of the students was taken up with high priority. Taking cognisance of the uncertain times in the wake of COVID-19 outbreak, infrastructural facilities were ramped up for conducting the placement related activities of the students smoothly through online modes. Facilities were upgraded for remotely conducting the tests, facilitating interviews through VCs and interacting with the students and the recruiters through a number of virtual platforms on AV modes. The details of the recruiting organizations along with their job offers and packages are given below:

Sl. No.	Name	No. of Offers	Package Offered (Rs in lakh per annum)
1	Tredance Analytics	6	6.5
2	Coriolis	7	6.5
3	Infoedge	1	12
4	Infosys	2	ECE: 6 ME: 3.6
5	Deloitte	7	7.6
6	Incture.	5	8
7	GAP	6	9.08
8	LTI	2	ECE:6.5 ME:8
9	Allegion	1	5.5
10	HashedIn by Deloitte	1	8
11	Virtusa	1	5
12	Capgemini	9	7.5
13	Byju's	1	6
14	Lentra	1	7.5
15	Napier Healthcare	1	10
16	Optum	4	10
17	Innovaccer (PPO)	1	14
18	InfoComm	2	4.5
19	Accenture	5	9.9
20	Bukukas	2	30
21	TVS	1	8
22	Innominds	1	12
23	CGI	3	6.8
24	Tiger Analytics	1	8.5
25	Cogoport	1	10
26	Nation with Namu	3	7.2
27	LatentView Analytics	3	6.5

Sl. No.	Name	No. of Offers	Package Offered (Rs in lakh per annum)
28	HCL	2	4.75
29	Navyug	1	5
30	SmartCoinFinancials	2	16.38
31	Cognizant	2	6.75
32	Tekion	3	17
33	TCS	1	9
34	Grifeo	7	4.8
35	Vedanta	18	9.45
36	IFB	3	5.5
37	Samsung	6	14.5
38	AlphaGrep	1	15
39	Samsung Delhi	15	15.5
40	Cubastion	1	6.5
41	KEC	6	4.75
42	Adani Enterprises	1	7
43	Oracle	2	8.22
44	BEL	7	11
45	Microsoft	4	46
46	VMware	1	19.9
47	Toshiba	1	4.25
48	Tetrahedron	1	2.8
49	Suzuki Motors	2	6.2
50	BPCL	2	18.45
51	Eldaas Technology	1	8
52	L&T ECC	1	6
53	Supr Daily (PPO)	1	31.8
54	Snapdeal (off campus)	1	14
55	Byjus Teaching Role	1	6
56	IBM	1	8.10
57	HCL (M.Tech)	1	6
58	Synopsys	1	20.46
59	Alstom	1	7
60	Moschip Technology	1	5

Rs. in lakh per annum

Rs. in lakh per annum

**Highest Package** **46**  
(Offered by Microsoft)

**Average Package** **12.17**

The Centre has all the state-of-the-art facilities to facilitate the campus hiring activities of the companies. It has a well-furnished hall for pre-placement talks with a capacity of 100 persons; a well-furnished group discussion room to hold group discussion for a group of 12 persons with 3 moderators; and 3 interview rooms. Additionally, the hall has 30 computers with thin client servers to conduct online tests in the pre-placement talk's venue itself. The Centre also utilizes the Conference Hall of the Institute for carrying out

video-conferencing and the Computer Centre when the need arises. In a bid to help the students brush up the technical knowledge, the Center for Career Development conducted GATE Training remotely with the generous support of the TEQIP III Scheme of the Ministry of HRD, Government of India, to improve the quality of technical education. Employability Assessment Tests were also conducted as an employability checkup and based on the comprehensive report, efforts are made to improve the overall student employability.

# STUDENTS ACTIVITIES

## Office Bearers



**Prof. Bibhuti Bhusan Biswal**  
Director



**Prof. Harish Chandra Das**  
Dean SW



**Dr. Amit Kumar Paul**  
President, Students Activity Centre



**Dr. Biplab Kumar Debnath**  
Vice-President, Cultural Committee



**Mr. Anderson Rapsang**  
SAS Assistant

## Student Council

**General Secretary - 1 (Cultural)**



**Mr. Abhijeet Kumar**  
B18EE005

**General Secretary - 2 (Cultural)**



**Ms. Neekshitha Reddy Dyasani**  
B19CE023

### Member 1 (From 3rd Year)

Mr. Rohit Kumar Prasad (B19ME015)

### Member 2 (From 2nd Year)

To be nominated later

Female Representative

Ms. Doliza Dolma Kharlyngdoh (B19CE003)

Post Graduate Representative1 (From M.Sc)

Yashu Bilotia (S20PH005)

Post Graduate Representative2 (From M.Tech)

George Henri (T20CE011)

Research Scholar Representative

J Sharailin Gidon (P18CE001)

Publicity

Sidhartha Kumar (B19ME001)

## Clubs



### Objectives of SAC

- To engage the students with various extracurricular activities such as sports and games, cultural activities, elocution, technical activities, NSS activities etc.
- To allow the students of the Institute to participate in inter-institutional sports, cultural and technical events in different parts of the country and brought laurels to the Institute.

### Objectives of Cultural Committee

- To involve students in various Literary Activities, viz. debate, quiz, essay writing, book writing, etc.
- To encourage students to participate in various Photography and Fine-art activities, namely, draw posters, banners, click good resolution photos from mobile to high resolution cameras.
- To motivate students to organize and perform in various events related to Dance and Drama.
- To inspire students to learn different cultures, foods, festivals of various regions of the country, thereby cultivate the essence of 'Ek Bharat Shreshtha Bharat'.
- To permit students to exercise music of traditional, contemporary, western with the presence of various musical instruments.



## Event - 1

- Name of the Event: **BOOKLET PUBLICATION COMPETITION**
- Organizing Section: **LITERARY CLUB, CULTURAL COMMITTEE**
- Date of Event : **01/04/2021 - 30/08/2021**
- Venue of the Event: **National Institute of Technology Meghalaya (Online)**
- No. of Participants : **9 Students (2 Teams)**
- Details of Experts (if any): NA
- Brief outcome of the event:

A booklet publication competition on Unsung Freedom Fighters from Northeast of India under the banner "AZADI KI AMRUT MAHOTSAV" was organized by the Literary Club and the HS Department of NIT Meghalaya from April 1, 2021, to August 30, 2021, where students were to write a biography on lesser-known freedom fighters of Northeast India about whom very limited information is available.

The aim of the Booklet Publication Competition is to present the story of the struggles and achievements of freedom fighters belonging to India's Northeastern states who have fought bravely against the British but are not very well known to the people of India, nor are there any significant works published on them.

Two teams from NIT Meghalaya participated and wrote a biography on ten (10) unsung freedom fighters from Northeast India, which are:

- The courageous leader - Rani Gaidinliu of Nagaland.
- The Zestful Woman Chief- Ropuiliani of Mizoram.
- History of spirited patriotism - TrilochanPohrel of Sikkim.
- An account of the life of Chengjapao Kuki
- Story of sacrifice of 1942 - KushalKonwar of Assam.
- The untold story of Ka Phan Nonglait of Meghalaya.
- The tale of the youngest martyr - TileswariBaruah of Assam.
- The rise of the Tripura leader - Sachindra Lal Singh of Tripura.
- The Martyred fighter - HaipouJadonang of Nagaland.

- Unheard story of MatmurJamoh, the Arunachali leader. The booklet was named "Unsung Freedom Fighters from Northeast of India" and was sent to NBT for review and publication. The booklet tells the stories of these fighters, some of whom have laid down their lives for the love of their motherland. The booklet aims to bring these stories of patriotism to light, enlighten and enrich the minds of its readers, and instill feelings of pride and respect for these Unsung freedom fighters from Northeast India.

#### The winners of the Booklet Publication Competition were:

- Jahnvi Kashyap
- Iphiginia Jyrwa
- Doliza Dolma Kharlyngdoh
- Sweety Merry Jyrwa Nongsiej
- Jessy Neharika Koduru
- Obeidullah Khan

#### The Runners-Up of the Booklet Publication Competition were:

- Tanisha Kant
- DyasaniNeekshitha Reddy
- Elveena Essa Nongkhlaw





## Event - 2

- I) Name of the Event: **ELITQUIZ (An Annual Intra-Institute Quiz Competition) ON THE OCCASION OF 152nd GANDHI JAYANTI**
- II) Organizing Section: **LITERARY CLUB, CULTURAL COMMITTEE**
- III) Date of Event: **02/10/2021**
- IV) Venue of the Event: **National Institute of Technology Meghalaya (Online)**
- V) No. of Participants: **40**
- VI) Details of Experts (if any): **Prof. Ayon Bhattacharjee (Quiz Master)**
- VII) Brief outcome of the event:

This Quiz Competition served as a platform to celebrate the 152nd Gandhi Jayanti, which ended up arousing a patriotic feeling in the hearts of all attendees. A preliminary round was conducted to shortlist six participants for the final round. To make the program more interesting, a special segment was added, 'Viewer's Questions', where live audience/attendees were given the opportunity to answer the passed questions by the participants. This significantly elicited great involvement from the audience. A total of eight viewers got prizes along with the two participants of the quiz event.

- VIII) **Selective Relevant Images (maximum 5):**



i) Welcome Address by Faculty i/c of Literary Club, NIT Meghalaya



ii) Prof. Ayon Bhattacharjee (Quiz Master) addressing the Participants



iii) Impeccable performance being manifested by the participants and the attendees.



iv) Winners of the Quiz Event



v) Publication through NIT Meghalaya Social Media Handles



## Event - 3

1. Name of the Event: **THE LANGUAGE ROOM (AN INTER-INSTITUTE DEBATE COMPETITION)**
2. Organizing Section: **Literary Club & EBSB Club, Cultural Committee.**
3. Date of Event: **30/10/2021**
4. Venue of the Event: **National Institute of Technology Meghalaya (Online-Mode)**
5. No. of Participants: **12**
6. Total No. of attendees: **80**
7. Details of Experts (if any):
  - Dr. Indrani Bhuyan (Judge)
  - Dr. Abhishek Sarkhel (Judge)
  - Mr. Dheeman Bhuyan (Speaker)
8. Brief outcome of the event:

On the eve of Rashtriya Ekta Diwas 2021, an Inter-Institute Debate Competition (Language Room) on the topic "The Constitution has United India" was jointly organized by the EBSB Club & Literary Club of NIT Meghalaya in

association with NIT Arunachal Pradesh and GKCIET Malda.

The competition saw participation from six teams, two each from the three participating institutes, in which NIT Arunachal Pradesh students bagged the best teams award of the Debate competition. Best speakers' awards were bagged by students from NIT Arunachal Pradesh and GKCIET Malda.

The attendees during the live session also took the pledge to foster and reinforce our dedication to preserving and strengthening our nation's unity, integrity and security.

Dr. Indrani B. Bhuyan, Registrar, ICFAI University Meghalaya & Dr. Abhishek Sarkhel, Assistant Professor, ECE Department, NIT Meghalaya were the Judges of the event. Mr. Dheeman Bhuyan, Ph.D. Scholar, ME Department, NIT Meghalaya was the Speaker of the event.



i) Address by Mr. Dheeman Bhuyan and Dr. Akhilendra Pratap Singh.



ii) Participants competing in the Debate Competition.



iii) Winners of the Language Room (An Annual Inter-Institute Debate Competition) 2021.



iv) Publication through NIT Meghalaya Social Media Handles



### Event - 4

1. Name of the Event: **CONSTITUTION DAY QUIZ (A QUIZ COMPETITION HELD ON THE OCCASION OF THE NATIONAL CONSTITUTION DAY, 2021)**
2. Organizing Section: **Literary Club, Cultural Committee**
3. **Date of Event: 26/11/2021**
4. Venue of the Event: **National Institute of Technology Meghalaya (Offline-Mode)**
5. No. of Participants: **10**
6. Total no. of attendees: **50**
7. Details of Experts (if any): **Prof. Ayon Bhattacharjee (Quiz-Master)**
8. Brief outcome of the event:

The Constitution Day Quiz is an Intra-Institute Quiz Competition held on the occasion of National Constitution Day to commemorate the adoption of the Constitution of India and to promote Constitution values among citizens. The event was organized by the Literary Club

The event saw participation from ten students of MSc, M.Tech, and Ph.D. One Mock Parliament session was also held.

These activities aim to reiterate and reorient the citizens towards the values and principles expressed in the Indian Constitution and encourage all Indians to play their rightful role in strengthening Indian Democracy.

Prof. Ayon Bhattacharjee, Physics Department, NIT Meghalaya was the Quiz Master of the event.



ii) Dr. Ayon Bhattacharjee (Quiz-Master) addressing the participants.



i) Winners of the Constitution Day Quiz 2021



iii) Participants in the mock parliament session



iv) Participants competing in the Quiz Competition.



## Event - 5

1. Name of the Event: **TALK-MASTERS (AN ANNUAL INTRA-INSTITUTE SPEECH COMPETITION) ON THE OCCASION OF 73rd REPUBLIC DAY**
2. Organizing Section: **Literary Club, Cultural Committee.**
3. Date of Event: **26/01/2022**
4. Venue of the Event: **National Institute of Technology Meghalaya (Online-Mode)**
5. No. of Participants: **14**
6. Total no. of attendees: **50**
7. Details of Experts (if any): **Dr. Abhishek Sarkhel (Judge)**
8. Brief outcome of the event:  
The Literary Club of NIT Meghalaya under the Student Activity Centre (SAC) has organised Talk Masters, an

Intra-Institute Speech Competition on the topic “Members of the Drafting Committee” on the occasion of the 73rd Republic of India (26 January 2022). The event was held online on the Google Meet platform.

The competition saw participation from fourteen students and seven participants were being shortlisted for the Final Round.

The event aimed to engage the participants as well as the audience to know more about the members of the drafting committee, their contributions, struggles, etc. Dr. Abhishek Sarkhel, Assistant Professor, ECE Department, NIT Meghalaya was the judge of the event.



i) Event Poster



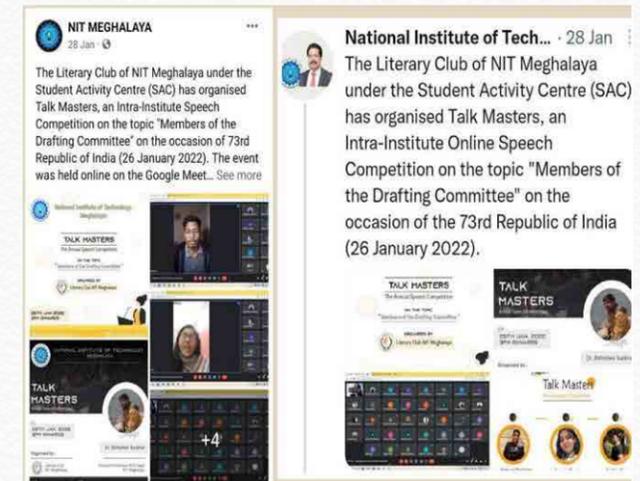
ii) Participants delivering their speech



iii) Attendees during the Event



iv) Winners of the Talk-Masters (An Annual Intra-Institute Speech Competition) 2022.



v) Publication through NIT Meghalaya Social Media Handles

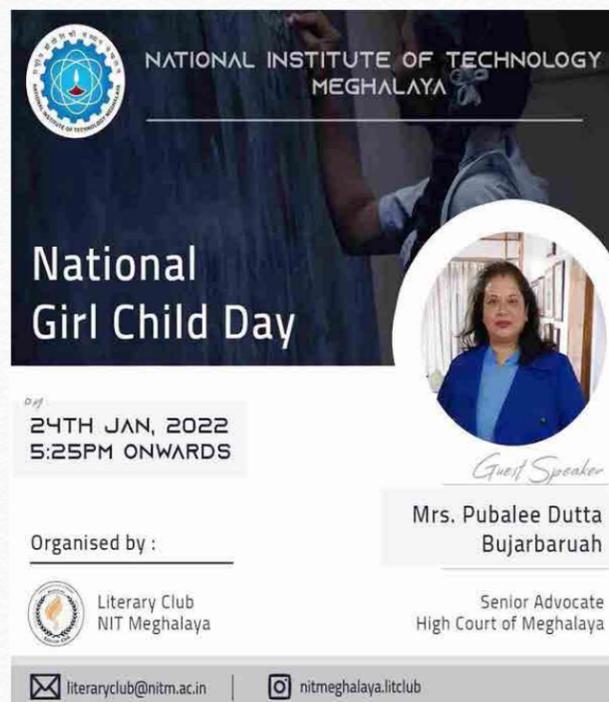
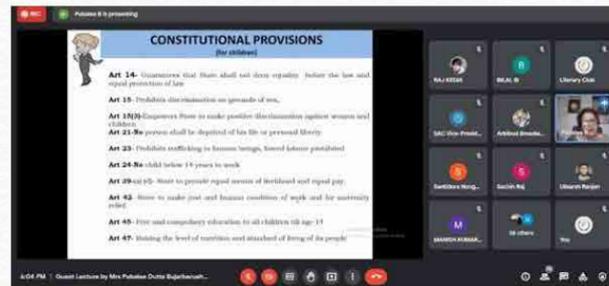


## Event - 6

1. Name of the Event: **INVITED-TALK ON THE OCCASION OF NATIONAL GIRLCHILD DAY**
2. Organizing Section: **Literary Club, Cultural Committee**
3. Date of Event: **24/01/2022**
4. Venue of the Event: **National Institute of Technology Meghalaya (Online Mode)**
5. No. of Participants: **50**
6. Details of Experts (if any): **Mrs. Pubalee Dutta Bujarbaruah (Senior Advocate, Meghalaya High Court)**
7. Brief outcome of the event:

On the occasion of National Girl Child Day, the Literary Club of NIT Meghalaya hosted an invited talk. Mrs. Pubalee Dutta Bujarbaruah (Senior Advocate, Meghalaya High Court) was the Guest speaker of the event where she delivered a speech on constitutional provisions for children, important legislations for the benefits of women, and government schemes available for a Girl Child, and lastly the influence of girls in every field.

### 8. Selective Relevant Images



## Event - 7

### Report on events conducted by Music-Club, NIT Meghalaya in FY 2021-22

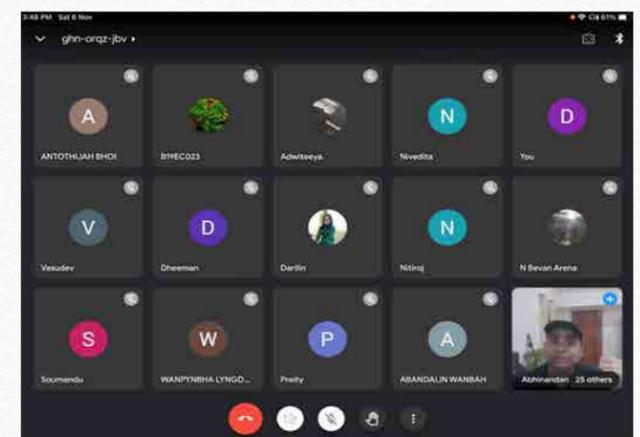
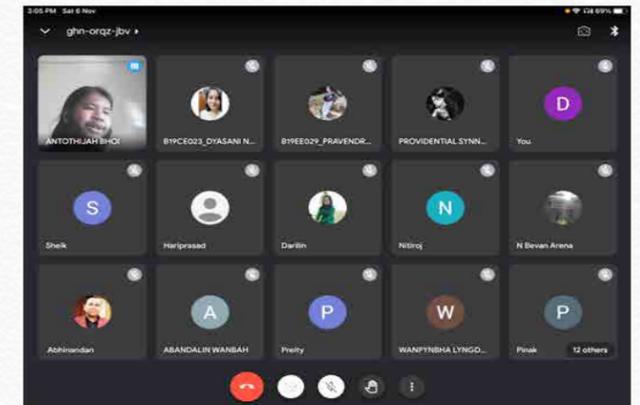
1. Name of the Event: **MUSIC CLUB ANNUAL COMPETITION (MCAC) 2021**
2. Organizing Section: **MUSIC CLUB, NIT Meghalaya**
3. Date of Event: **06/11/2021**
4. Venue of the Event: **At National Institute of Technology Meghalaya via Online mode**
5. No. of Participants: **9**
6. Details of Experts (if any): **Mrs. Darilin Jovita Masharing**
7. Brief outcome of the event:

The Music Club Annual Competition (MCAC2021) was held on 6th November, 2021. The competition had a total of 09 participants and was held using an online mode of communication (Google Meet). All the participants participated and the winners were announced a few minutes after the performances.

Details of the Winners are as follows:

S. No.	Position	Name	Roll No
1	First Prize	Nitiroj Medhi	S21MA005
2	Second Prize	Dheeman Bhuyan	P18ME007
3	Third Prize	Abhinandan Kalita and Harshit Sagar	P19EC001 and B19EC023

### Some of the Photographs from the Event:



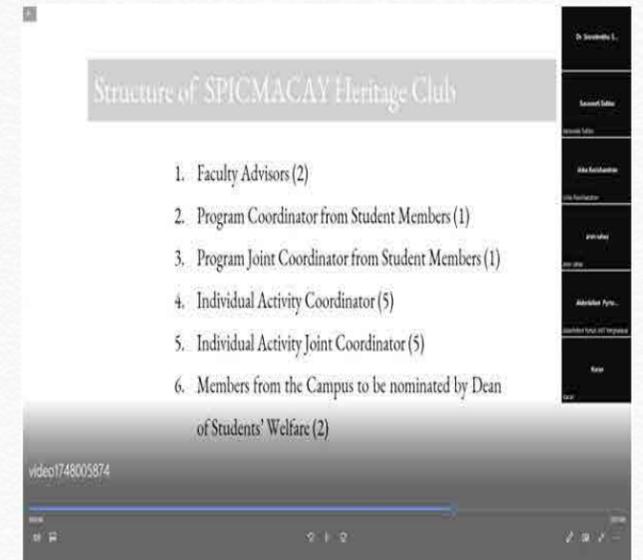


## Event - 8

1. Name of the Event: **Online ORIENTATION Program by SPIC MACAY (Society for the Promotion of Indian Classical Music And Culture Amongst Youth)**
2. Organizing Section: **MUSIC CLUB, NIT Meghalaya and SPIC MACAY**
3. Date of Event: **29/03/2022**
4. Venue of the Event: **At National Institute of Technology Meghalaya via Online mode**
5. No. of Participants: **40+**
6. Details of Experts (if any): **Mrs. USHA RAVICHANDRAN (currently the National Vice Chairperson of SPIC MACAY), Shri Arun Sahay, Mr. Hemant Menon, Mrs. Saraswati Subbu, Shri Karan Nanda and Shri Sujit Khandelwal from SPIC-MACAY.**
7. Brief outcome of the event:

A brief description was given about the history of SPIC MACAY, its concept, its philosophy and its importance for modern day students. The students and Faculties of NIT Meghalaya were introduced to the world of Classical and Folk music and Classical, Folk dance and the various Modules and the Activities of SPIC MACAY and also about the SPIC MACAY HERITAGE CLUB, its importance and its various tasks and responsibilities.

8. **Some of the Photographs from the Event:**





## Event - 9

Photography and Fine Arts Club of Cultural Committee under Student Activity Centre (SAC), NIT Meghalaya organized the "Annual Painting Competition" on 16th October 2021, from 11:00 A.M. to 1:00 P.M on the topic 'save the water.' The program took place online mode (Google Meetlink: <http://meet.google.com/nsv-gand-vok>). The awardee list is as follows as per the judgment:

S. No	Position	Name	Roll No
1	First Prize	Amrutha K	T21CE014
2	Second Prize	Somya Sharma	S21CY001
3	Third Prize	Sushmita Paul	B18CS007

Some of the Photographs from the Event:



## Event - 10

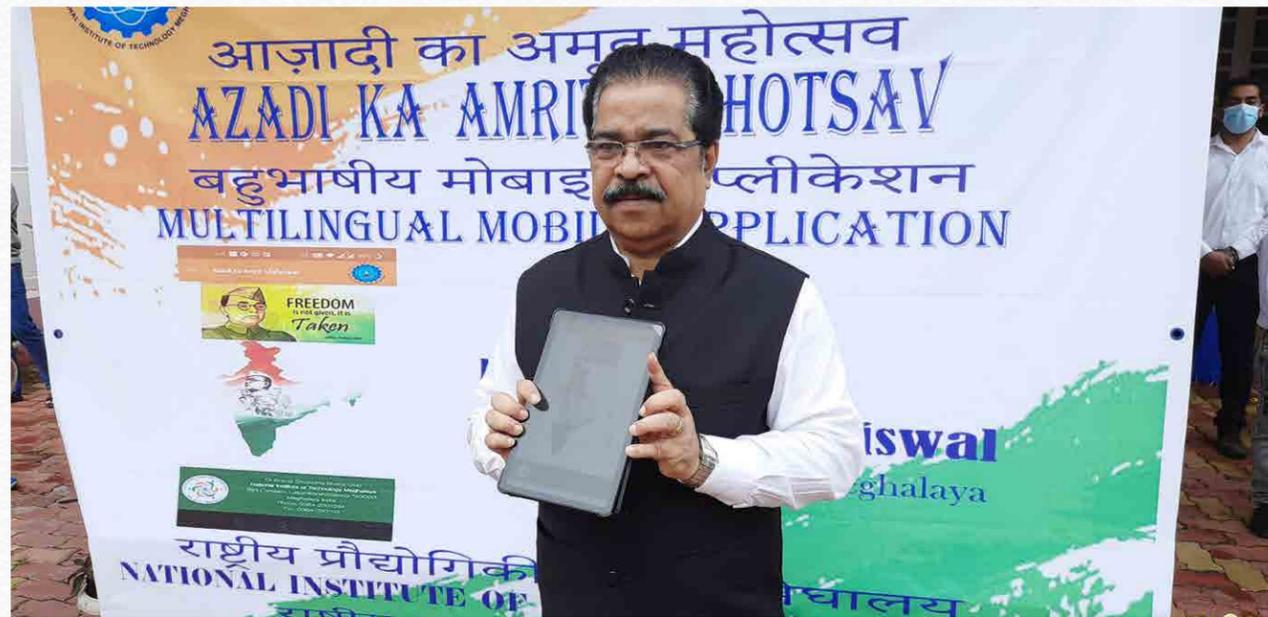
Photography and Fine Arts club in collaboration with Vigilance Office of NIT Meghalaya organized one Intra Institute Poster painting Competition on the 31.10.2021 on the occasion of Vigilance awareness week.





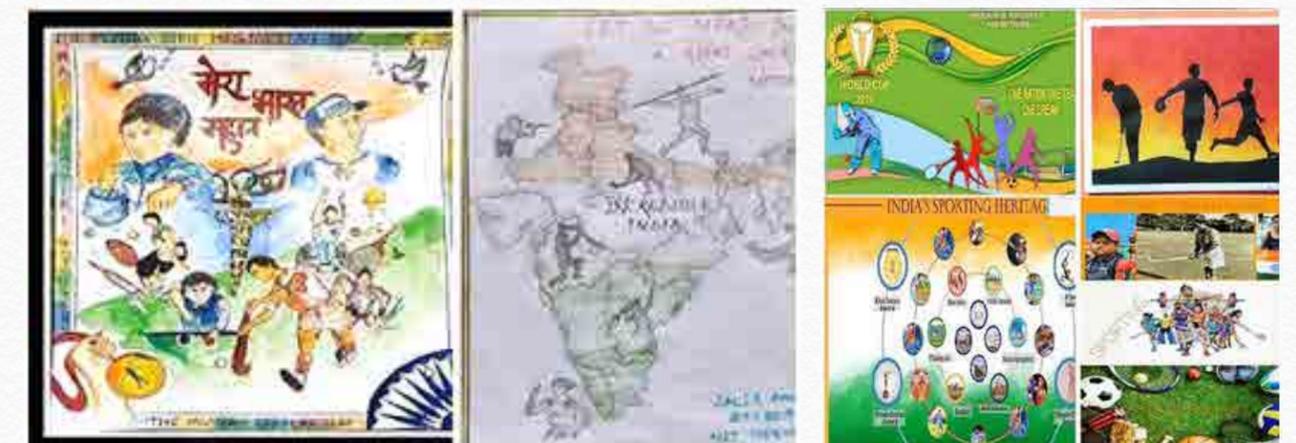
### Event - 11

Launching of Mobile App "AzadiKaAmritMahotsav" on 75th Independence Day EBSB Club 15.08.2021



### Event - 12

Joint Event Poster Competition on India's Sporting Heritage by Ek Bharat Shreshtha Bharat Club (EBSB) by NIT Meghalaya, GKCIET Malda, West Bengal and NIT Arunachal Pradesh. EBSB Club 25/09/2021





## Event - 13

The Ek Bharat Shrestha Bharat Club and the Literary Club, NIT Meghalaya, is going to organize the debate Competition on the topic "The Constitution has United India" on October 30th, 2021, Jointly with NIT Arunachal Pradesh and Ghani Khan Choudhury Institute of Engineering & Technology Malda (GKCIET). EBSB 30.10.2021

**INTER-INSTITUTE DEBATE COMPETITION**  
on the topic  
**"THE CONSTITUTION HAS UNITED INDIA"**

**AWARDS**  
- Winner Team (2000 INR)  
- Runner-up Team (1500 INR)  
- Best Speaker (1st, 2nd & 3rd position),  
1500 INR, 1250 INR & 1000 INR respectively

**JOINTLY ORGANISED BY**  
Ek Bharat Shrestha Bharat Club NIT Meghalaya  
Literary Club NIT Meghalaya

**NIT MEGHALAYA**  
in association with  
**NIT ARUNACHAL PRADESH & GKCIET MALDA**

**30TH OCT 2021**  
**2PM ONWARDS**

**REGISTRATION LINK**  
[bit.ly/languageroom](https://bit.ly/languageroom)  
**GOOGLE MEET LINK**  
[bit.ly/\\_meetlink](https://bit.ly/_meetlink)

literaryclub@nitm.ac.in nitmeghalaya.litclub ebsbclub@nitm.ac.in



## Event - 14

Joint Event on Essay Writing Competition by Ek Bharat Shrestha Bharat Club (EBSB), NIT Meghalaya, GKCIET Malda, West Bengal and NIT Arunachal Pradesh. EBSB Club 23.10.2021

**ESSAY COMPETITION**

**ORGANISED BY**  
Ek Bharat Shrestha Bharat Club  
NIT Meghalaya

in association with  
**NIT ARUNACHAL PRADESH & GKCIET MALDA**

**REGISTRATION**  
23TH OCT 2021  
10-12PM

[ebsbclub@nitm.ac.in](mailto:ebsbclub@nitm.ac.in)





## Event - 15

1. Name of the Event: **INTRA-NIT DANCE COMPETITION-2021: RHYTHM IN MOTION**
2. Organizing Section: **Dance and Drama Club, Cultural Committee.**
3. Date of Event: **27/10/2021**
4. Venue of the Event: **National Institute of Technology Meghalaya (Online-Mode)**
5. No. of Participants: **6**
6. Total no. of attendees: **65**
7. Details of Experts (if any): **Judge- Miss Pinky Ghosh (Dance and Music Teacher)**
8. Brief outcome of the event:  
RHYTHM IN MOTION is an Annual Intra-NIT Dance Competition-2021 that serves as a platform for enhancing aesthetic talent in the field of dance and drama with different flavours. The event was organised by the Dance and Drama Club, Cultural Section under Student

Activity Cell. It was a rhythmic culmination of Traditional, Classical, Western, Folk Dances and more at INTRA NIT DANCE COMPETITION-2021: RHYTHM IN MOTION.

The event was open to all the students of NIT Meghalaya and had six students had participated from B.Tech and M.Sc. Participants have submitted their video clips for the preliminary round and selected for final round based on their performance. Final round was organised successfully dated on 27th October 2021 via online mode. Participants took part made the event for grand success. These activities aim to allow people to express a wide range of thoughts and emotions through their performances and let us rediscover the essence and ardor of dance at Rhythm in motion under the bright leadership of Dr. PiyushPratap Singh, Faculty in-charge of Dance and Drama Club.

### Winners of the Intra-NIT Dance Competition 2021

S. No.	Name of Participants	Roll. No.	Institute email ID	Winners
1	BipashaSaikia	S21CY013	s21cy013@nitm.ac.in	1st Place
2	WanpynbhaLyngdoh	B19ME017	b19me017@nitm.ac.in	2nd Place
3	PretynisHadia	B19EC018	b19ec018@nitm.ac.in	3rd Place

### Selective Relevant Image:



i) Dr. Piyush Pratap Singh (Faculty in-charge of Dance and Drama Club) addressing the participants.



ii) Participants performing in the FINALS



iii) Participants performing traditional dance in the FINALS



# Yabhakriti

The Robotics Club of NIT Meghalaya

## Faculty Incharge

**Dr. Bunil Kumar Balabantaray**

Assistant Professor, Department of Computer science Engineering

**Harshit Sagar**

Convener | (B19EC023)

## ABOUT US

'YABHAKRITI' The Robotics Club of NIT Meghalaya is one of the dedicated clubs to encourage and prepare the students to develop robotics-based solutions towards the real-time problems faced in day-to-day activities in human life. It also prepares the students (club members) to participate in different competitions at different levels. The NIT Meghalaya family is well known for its unique training programs and working procedures to develop trainers and technically good technocrats for society. The year 2018 gave its total effort towards training and project developments in Robotics and drone fields. Since its birth, it is associated with the Govt. of Meghalaya as one of the state's school children's training partners.

## EVENTS ORGANISED

EVENT	DATE	DESCRIPTION
TECHNICAL EVENTS ORGANISED IN CONGITIA (Treasure Hunt, Design Cave, TECHSTORM HOMECOMING, TINKER BLINK, COGNITHON)	OCTOBER 03, 2021 OCTOBER 04, 2021 OCTOBER 06, 2021	Robotics Club had brought to the table various Robotics Events for the Annual Technical Fest Cognitia 2K21. The 3rd year students, under the guidance of the final years, had tutored the 2nd year students in various designing software like AutoCad and Fusion360 along with the familiarization with the TickerCad platform. The event Techstorm Homecoming was a major success as it utilized the bright innovative minds of the students to provide effective solutions to problem statements.
Freshers' Orientation program (2021 Batch)	December 17, 2021	A fundamental introductory session was organized by the club in the orientation program of the B.Tech batch of 2021. The prime objective of the event was to introduce and familiarize students with the establishment, aim, activities and achievements of Yabhakriti.
SPACE NOVE WORKSHOP ON SPACE ROBOTICS	February 08, 2022 - February 09, 2022	One of the highlights of the year was the conduction of a two-day space robotics workshop organized by SPACEONOVA. The workshop provided a unique and exciting opportunity for the space enthusiasts to make a career in the space industry. The workshops focused on the basics of space robotics and enthralled the students with a special hands-on session on ROS and simulations.

## FRESHERS' ORIENTATION PROGRAM (2021 BATCH)

An introductory was organized under the orientation program for the B.Tech batch of 2021. The agenda of the session was an introduction to Yabhakriti – the Robotics club of NIT Meghalaya, its establishment, broad function areas and long-term goals. The club achievements, activities and workshops were also familiarized to them.

The session proved to be fascinating and informative for the students. This could be gauged by the excited participation of the students in the club. We successfully conducted our introductory session for freshers with great enthusiasm for our club members' collaborative efforts.



A glimpse of the Powerpoint presentation



A glimpse of the online orientation program

## CLUB ACTIVITIES ORGANISED

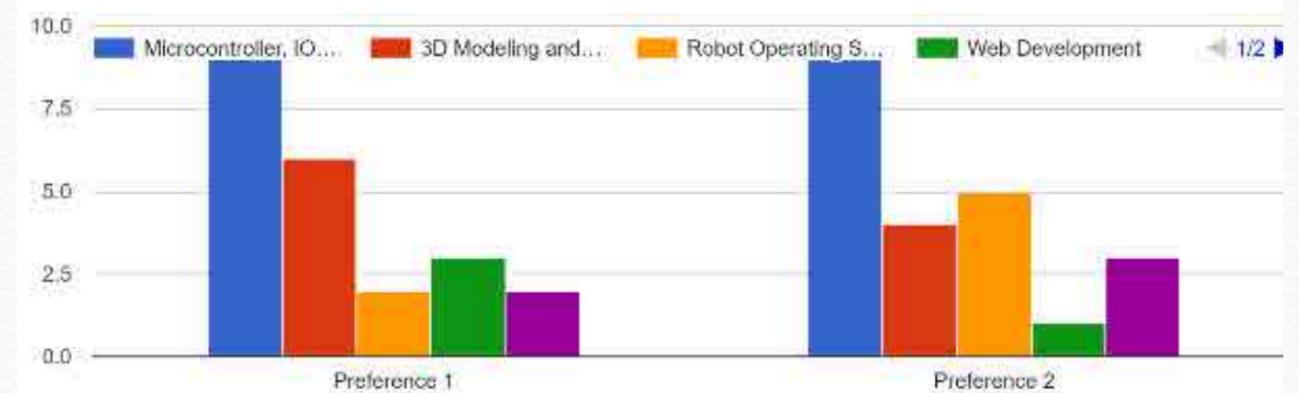
EVENT	DATE	DESCRIPTION
Co-ordinator Selection in YABHAKRITI for 2020 batch	January 01-02, 2022	An online mode of selection was organized to enroll the 2020B.Tech batch students into the club. Total responses: 23 students Selected students: 19 students The students appointed were given the responsibility of conducting workshops and events together with the core team.
Introductory session for freshers	January 19, 2022	A preliminary session was conducted with the 2021 B.Tech batch for briefing the students with robotics and its broad applications.
3D Designing and Microcontroller, IoT and PCB Designing Sessions for 2021 Batch	January 20, 2022 January 30, 2022	As a secondary session after the Arduino workshop was organized for the 2021B. Tech batch on the 3d Designing and Microcontroller, IoT and PCB Designing , the students here were given a head start with the broad concepts and practical implementations of 3D Designing.

## COORDINATOR SELECTION IN YABHAKRITI FOR 2020 BATCH

During January 01-02, 2022, the core team had planned to select coordinators from the 2020 B.Tech batch (Second - year). The response received from the 2nd year was delightfully positive and encouraging. A total of 23 students had registered for enrollment into the club. The procedure of selection of members was done online through PowerPoint presentations on fundamental concepts of robotics. The selection procedure was of the form of a two-day session, where the Core Team and Technical Team closely examined the students.

Through the collaborative decision of the core and technical team, 19 students were filtered out and designated positions in various domains of the club. These selected students now hold responsible positions in the club and contribute their best towards building a robotics environment in the Institute.

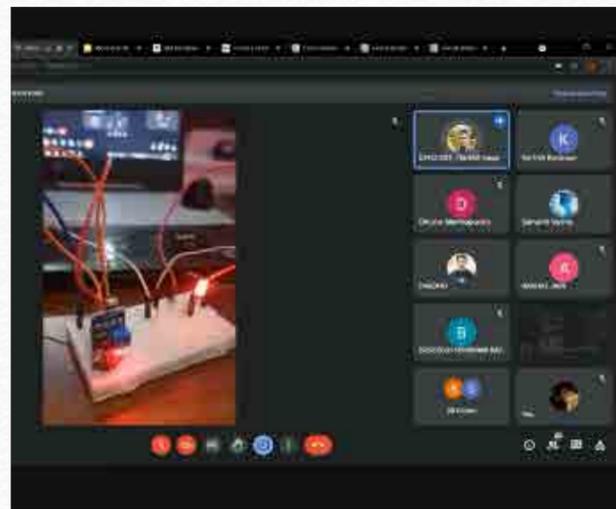
## Survey of the response received from 2020 B.Tech Batch



## COGNITIA 2K21

The annual technical fest of the institute, Cognitia 2021 proved to be a major success. The annual technical fest, which is aimed at encouraging young minds to innovate and bring new ideas to the table, materialized to an exceptionally organized event. Despite the prevalence of Covid pandemic, the club along with the support of some notable teams, had conducted the technical fest with great dedication. The fest was able to garb the eyeballs of all the students of the institute as well as that of other institutions in the same manner as it would have been in offline scenario. The various Robotics events conducted by the club had made the optimum utilization of the online mode by disseminating knowledge of software and online platforms that bridged the gap between online and offline mode. The club had organized a mixed bag of fun as well as challenging events for the students to utilize their technical skills in the right direction. The Robotics events conducted are as follows:

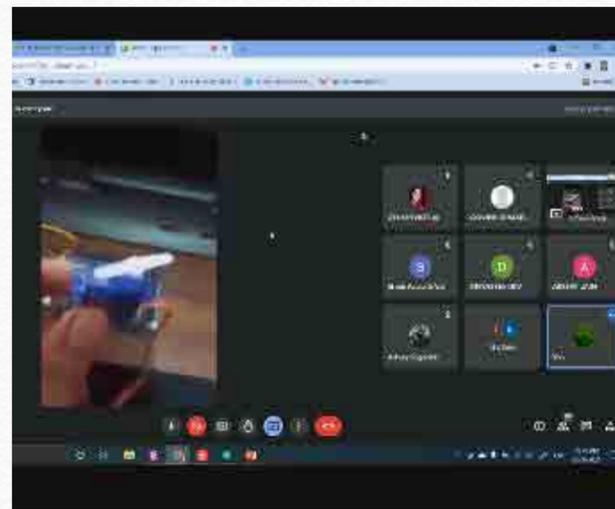
1. **Design Cave:** The 3rd year students, under the guidance of the final years, had imparted the knowledge of designing software such as AutoCad and Fusion 360 to implement and design 2D or 3D model of an object/tool/equipment. The best design was awarded with handsome rewards.
2. **Treasure Hunt:** It was a fun event full of riddles that was designed to stimulate the logical minds of the participants.



3. **TinkerBlink:** An Online event where the students had to simulate the solution for the given problem statement on the online Tinkercad Simulator. The reward were based on the precision of the code and the circuit design.
4. **Cognithon:** A theme-based hackathon, where the students proposed any working solution/model (hardware or software) for the below-mentioned theme:
  - Sanitation and hygiene
  - Waste management
  - Flood relief
  - Women/personal/emergency security
  - Agriculture-based innovation

The event dealt with skills including robotics, circuitry, and design.

5. **Techstorm Homecoming:** With the core of Robotics in its heart, this event was a great opportunity for the students to put all their knowledge of robotics to actual use. The students were given a problem statement for which the students had to provide an optimal solution to, in a stipulated interval of time. The event encouraged the hands-on use of hardware to provide original solutions to the problem statements.



The response that Cognitia 2021 received speaks for itself in terms of the love and admiration it had received from all the students. It was indeed an enthralling experience provided at the comfort of one's own home.

## SPACEONOVA, SPACE ROBOTICS WORKSHOP

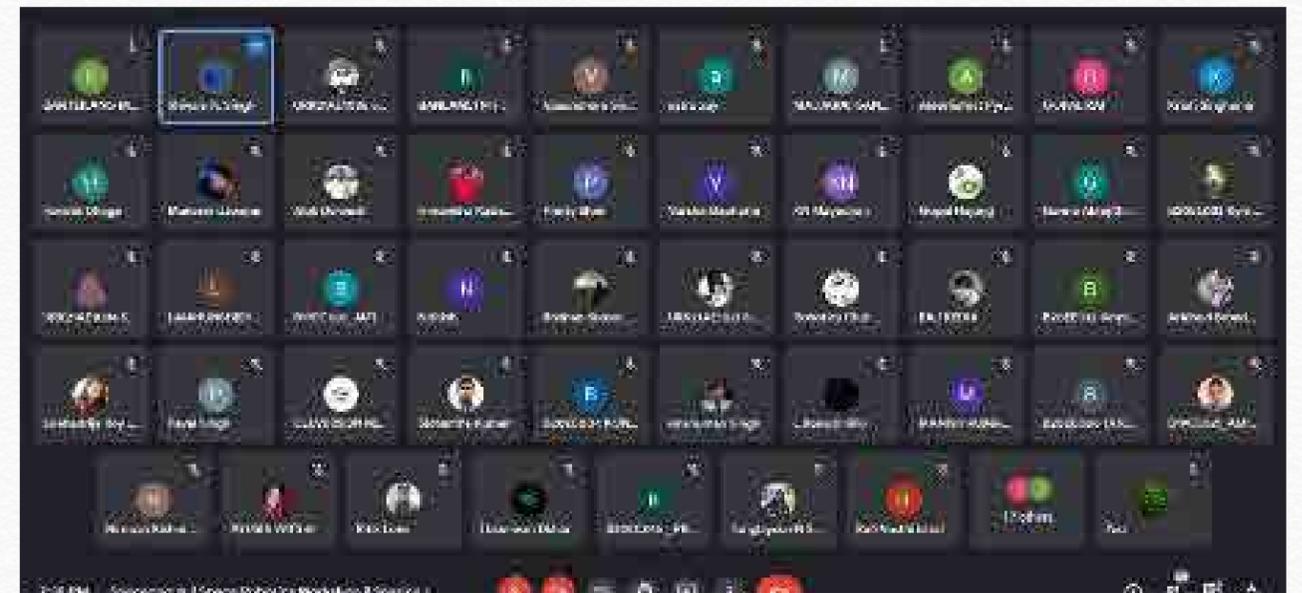
A significant event of the year was the conduction of the first ever space robotics workshop conducted by Spaceonova. Spaceonova, a space education and research-based company with a vision of establishing a space ecosystem where anyone can LEARN, CREATE, INNOVATE and IMPACT had organized a free two-day workshop on space robotics on the 8th and 9th of February 2022. The workshop was tailor-made to cater to the growing enthusiasm of students in the domain of Space Exploration as well as provided the pupil with a head-start into the ongoing research with their special hands-on module.

The first day witnessed an introduction to the application of robotics in space and the career prospects in space robotics.

The basic idea of space robotics was engrained in the minds of the students thereby increasing the enthusiasm for the next session.

The second was dedicated to hands-on session ROS and simulations where the students were guided step by step to install the necessary software. The students were then taught the procedures to design and simulate a robot meant for surveying the space.

Spaceonova was indeed an excellent beginning to 2022 for the club as we were able to introduce a new and exciting concept to the students.



Participation for the of Spaceonova Space Robotics Workshop



Session 1 of Spaceonova Space Robotics Workshop



Session 2 of Spaceonova Space Robotics Workshop

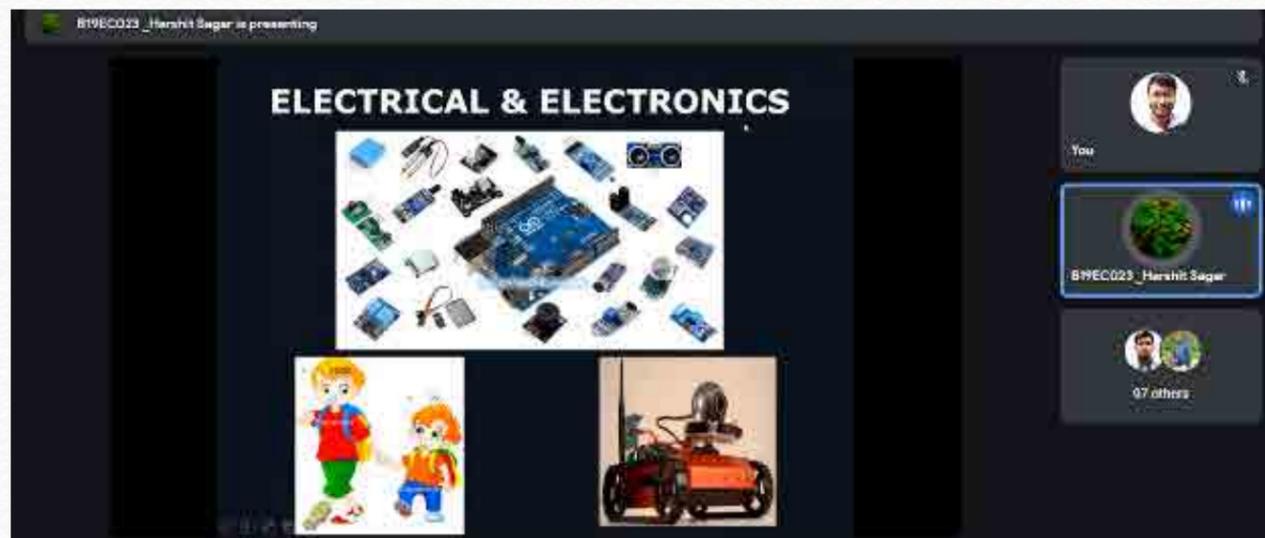
## INTRODUCTORY SESSION FOR FRESHERS

The admission of the B.Tech batch of 2021 called for an introductory session. The session was on online mode through google meet where the students shared their ideas about Robotics. The few important questions engrained in the minds of the students were, "What they know about Robotics", "What is Yabhakriti?", "How will Yabhakriti help them in Robotics?". The objective of the session was to clear their doubts on the field of Robotics.

We discussed all the possibilities in robotics and the numerous fields where robotics play a vital role. As it was our second interactive session with them, it was kept very simple. We thoroughly discussed all the things and only the outline of the robotics. Our session was user-friendly. Every detail was explained from the ground that made them more curious to learn the basics.



A glimpse of the Powerpoint presentation

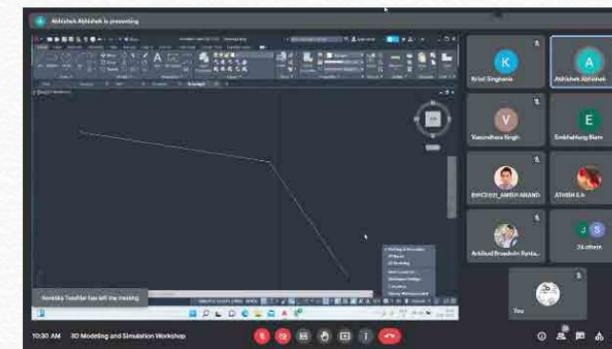


A glimpse of the Google meet interaction

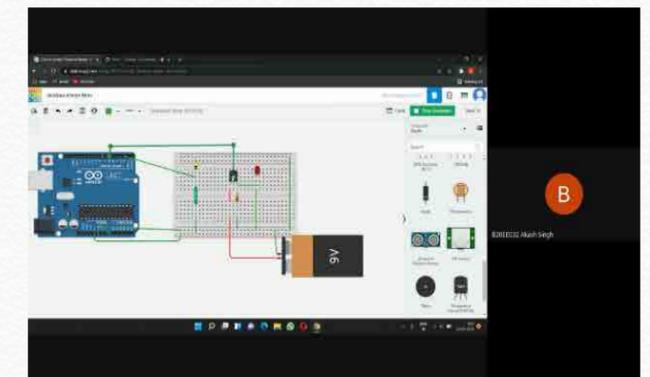
## 3D DESIGNING AND MICROCONTROLLER, IOT AND PCB DESIGNING SESSIONS FOR 2021 BATCH

The Internet of Things (IoT) refers to connecting objects to each other and humans through the Internet. The applications of IoT technologies are multiple because it is adjustable to almost any technology capable of providing relevant information about its operation, about the performance of an activity and even about the environmental conditions that we need to monitor and control at a distance.

Hence, with the same motive and enthusiasm, the core team of the club delivered a session on IoT to the 2021 B.Tech Batch on January 22, 2022, familiarizing them with the broad concepts and applications. The core team also presented their projects on the same. The entire session was highly interactive and successful to a great extent.



A glimpse of the Google meet interaction



## CONCLUSION

Yabhakriti is looking forward to doing some new activities which can be executed in the current covid situation like a few industrial projects. We look forward to buying some new components to move on to new technologies which can help our students for a brighter future in Robotics like Drone technologies, ROS-related components and some other components which can help in online education in the robotics domain.

Robotics is a branch where hardware setup is necessary for proper learning and understanding. The covid pandemic had thwarted our plans to conduct activities that required hardware resources. However, with the start of the offline

classes we are looking forward to transition our plans on paper to a reality.

It is very sad that corona has a harder impact on our club but we the members of the robotics club are determined with our full effort for the best results in upcoming sessions. We are planning to get in touch with industries and today's robotics environment in the world and we are putting our best to be the best in robotics among other roboticists and looking forward to the great opportunities in robotics to serve the nation in a better way.

# Coding Club

## Achievements, Initiatives and Activities 2021-22

### Faculty incharge:

**Dr. Shubhankar Majumdar**

Assistant Professor, Electronics & Communication Engineering

### Convenors:

**Utkarsh Kumar, Dorababu Arigi**

codingclub@nitm.ac.in

### Achievements:

- 24th Dec 2021:** After qualifying online coding rounds, the team of three coders of Coding Club (Ritik Mani Yadav, Meenakshi Kharel, Keshav Krishna B.Tech, NITM) represented NIT Meghalaya at **International Collegiate Programming Contest (ICPC)** at Asia Amritapuri and Gwalior-Pune Regionals 2020.
- 24th Jan, 2021:** After qualifying for the Amrita INCTF's final round, the team of four hackers (Viraj Vaishnav, Rohit Patidar, Chonsram T Sangma, Isha Pal) managed to get into the top 50 teams of the final round and they represented NIT Meghalaya at **INDIA'S FLAGSHIP CYBER SECURITY CONTEST AND CONFERENCE (Amrita INCTF)**
- 7th April, 2022: APAC Generation Google Scholarship 2022**  
First Divyasree Dev's (B.TECH) resume and essay got shortlisted . She was shortlisted for the coding round, which took place on 14th January 2022. They were given two questions and had only an hour to answer any one of them. She finished both of them in the allotted time. Following that, she received a call for an interview on 17th March 2022.Finally the selection result came out on 7th April, 2022.

#### 4. **2nd May, 2022: Microsoft Intern Engage 2022**

On 21st April 2022, Divyasree Dev's (B.TECH) resume got shortlisted. After that, she participated in two Online Challenges which were eliminatory in nature and took place respectively on 24th and 27th April 2022. On 2nd May 2022, she received a mail informing that she had been selected as a mentee for Microsoft Intern Engage 2022.

### Initiatives:

- Designed and created a well structured Coding Club website based on high demand technology in industry.
- Created The National Institute of Technology Meghalaya Engineering Association (NITMEA), a mentorship program for the 1st and 2nd year students.
- Take the initiative to conduct all the coding activities in Cognitia 2022.

### Activities

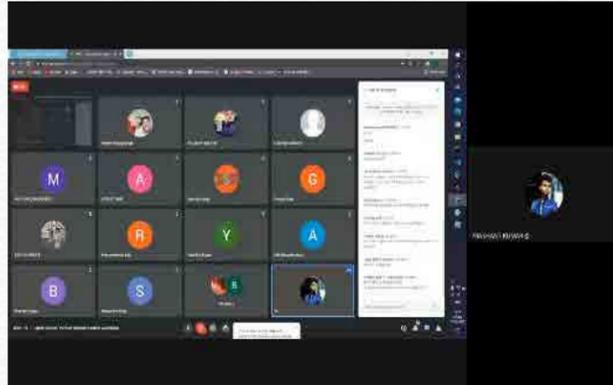
Date	Event Title	Description	Duration	Number of students
7th Aug , 2021	Introductory session	Introduced daily DSA lecture series, references, resources and coding websites	1 Hour	150
8th Aug - 9th Sep, 2021	Daily 3-4 hours competitive programming and DS Algo lectures	Conducted 3-4 hours lecture for creating good coders in college.	1 Month	90
15th Aug , 2021	Discussion Session 1	Discussed practice problems, students' coding related problems, development related problems, and other problems and best solution for the same.	3 hours	60
8th Aug - 9th Sep, 2021	Daily 10 minutes-quiz	The students getting highest score were declared as winner	1 Month	90
29th Aug, 2021	Codefever	Coding Competition	2 hours	50
2nd Sep, 2021	Hiring	Coding Club team hiring process started	3 rounds of interview	80
4th Sep, 2021	Discussion Session 2	Discussed practice problems, students' coding related problems, development related problems for the website.	3 hours	60
26th Sep, 2021	Hackathon Bootcamp	Conducted bootcamp of git, github and development for hackathon to be conducted in Cognitia .	3 days	150
26th Dec, 2021	Open Source and Version Control Workshop	Workshop on Version Control	2 days	150
1 Jan, 2022	NITMEA Mentorship Programme	Mentorship Program for the 1st and 2nd year students.	7 days	150
16th Jan, 2022	Introduction to Computer Networks and Basics of Cyber Security	Workshop on computer networks and cyber security.	3 days	150
19th Feb, 2022	Code Megh	Coding competition of 2 hours. Award positions: winner, runner up and fastest finger	2 hours	75

### Summary:

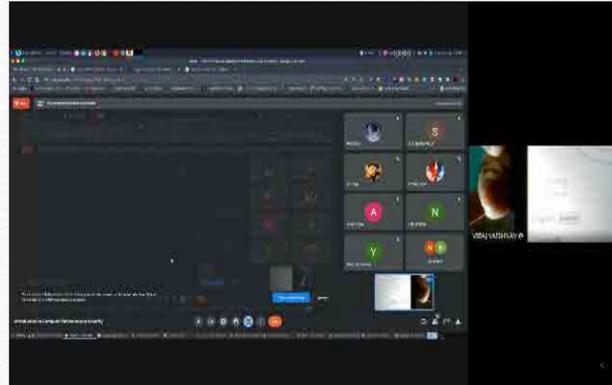
Total number of coding sessions	30
Total number of coding contests	2
Total Quiz	30
Total discussion sessions	2
Total bootcamp session	1
Total webinars	2

## Photographs:

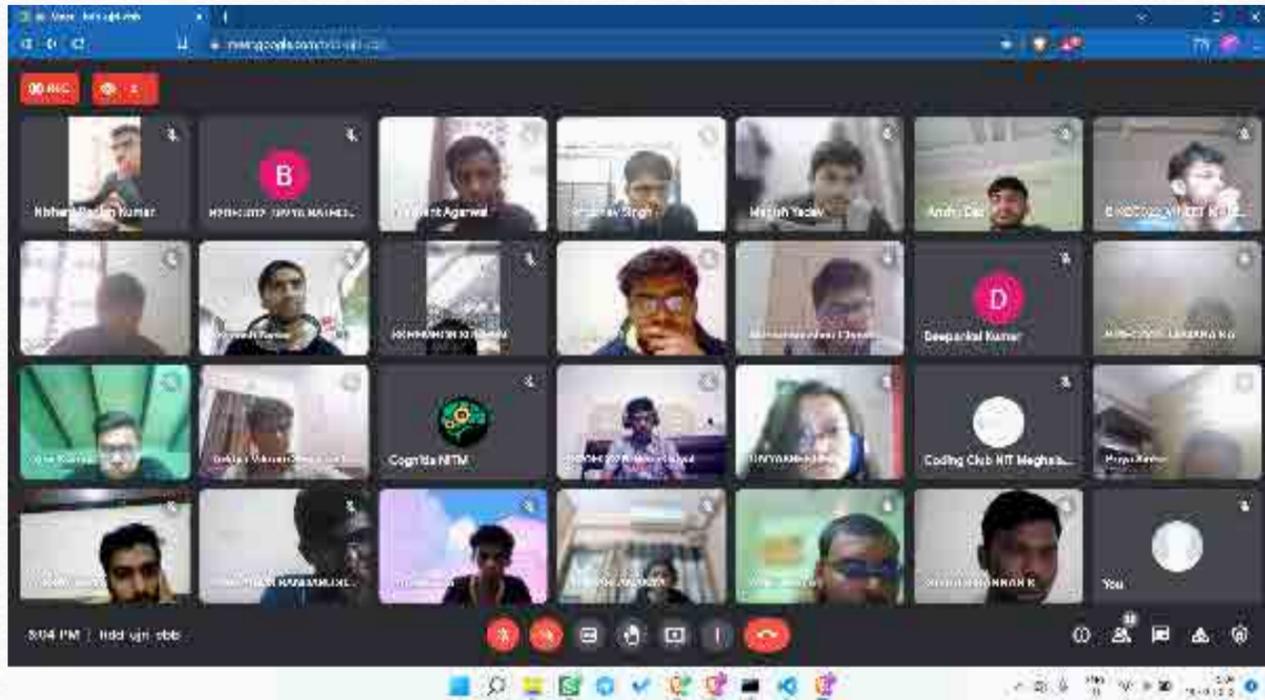
### 1. Open Source and Version Control Workshop



### 2. Introduction to Computer Network and Cyber Security



### 3. Code Megh, 2022



# Cognitia 2021

1. Name of the Event: **Cognitia 2021 (The Annual Technical Festival of NIT Meghalaya)**
2. Organizing Section: **TECHNICAL COMMITTEE, SAC**
3. Date of Event: **03/10/2021 - 08/10/2021**
4. Venue of the Event: **National Institute of Technology Meghalaya (Online)**
5. No. of Participants: **350**
6. Details of Experts:
  - i. Mr. K.J. Patel, Sr. Executive Director, IFFCO, Paradeep
  - ii. Dr. Malay Kumar Pradhan, General Manager (F&B), OSDMA, Govt of Odisha.
  - iii. Prof. Debabrata Das, Director, IIIT Bangalore
7. Brief outcome of the event:  
The 7th edition of NIT Meghalaya's Annual Technical Festival Cognitia 2021, the biggest Technical festival of Meghalaya was held from the 3rd October to 8th October 2021.

COGNITIA is the most awaited and anticipated technical festival of the National Institute of Technology, Meghalaya incorporating an array of events grouped under Robotics events, Coding events, Departmental events, and Gaming events. Since it was a challenging year and it was decided to do the year's Techfest virtually so everyone could join and be part of the celebration from their homes.

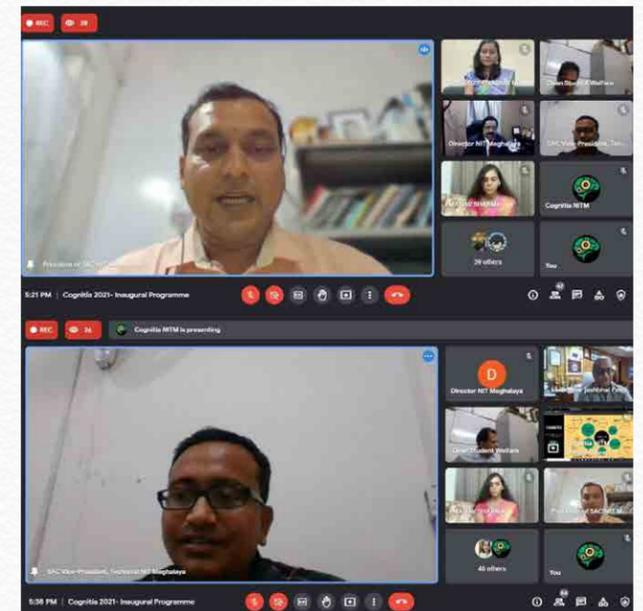
A host of events including Guest Lectures, Coding events like HackOverflow, Code-Utsav, Prasan-baan, Hack-Mafia, Game Development Workshop, Robotics events like Design Cave, TinkerBlink, Techstorm: Homecoming, Treasure Hunt, Cognithon & various other events like Departmental events were organised.

The events saw a large number of participants. The events were not only limited to students from NIT Meghalaya but also to students from other institutions and colleges across the nation.

### 8. Selective Relevant images:



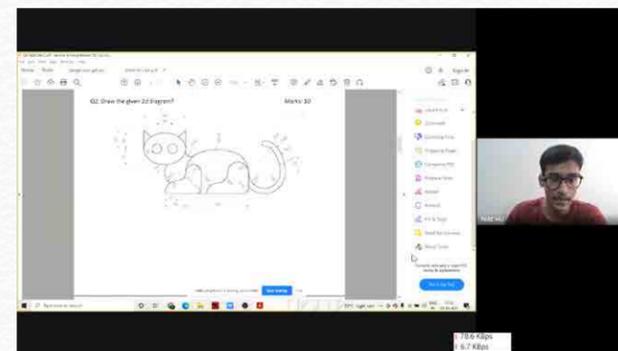
i) Chief Guest declaring Cognitia 2021 open.



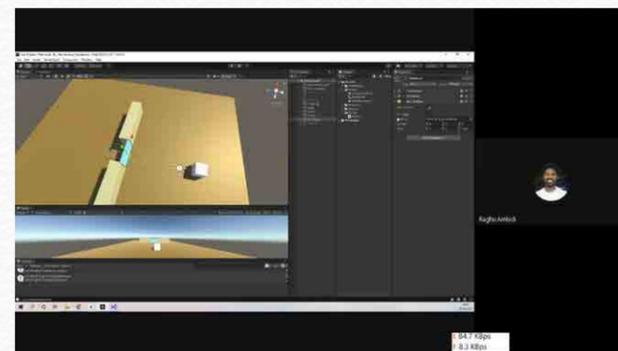
ii) Cognitia 2021 Inaugural Ceremony



iii) Cognitia 2021 Poster



iv) Snapshot from an Event



v) Game Development Workshop

# Sports Events held & conducted under SAC 2021-22

International Yoga Day | Sports & Games | 21.06.2021



### Fit India Freedom Run 2.0 | Sports & Games | 13.08.2021-02.10.2021



### Intra-NIT Meghalaya Chess & Carrom Competition | Sports & Games | 06.04.2022



# Central Library

The Central Library, which is the heart of the Institute, was established in 2012. It serves as a creative and innovative partner in supporting the teaching, learning, and research activities of the Institute. The Library holds the knowledge resources predominantly related to Science and Technology, Humanities, Management & other allied subjects. The Library is computerized with an integrated system connected to the Campus Network, providing an e-resource facility to the institutional community. The entire Library collection, including the online databases, is made available through Institute's network. Library collection can also be searched through Web OPAC. The Library has also subscribed to the KNIMBUS Remote Access tool. The students, faculty members, and research scholars can access all the e-resources subscribed by the Library and open access journals remotely using KNIMBUS.

Being the intellectual heart of the Institute, The Central Library of NIT Meghalaya aspires to excellence in support of the learning, teaching, and research mission of the Institute with an aim:

1. To evolve an ICT-driven world-class academic and research library, serving as an access point institution to global information resources and services in all subject fields.
2. To create a Heritage Library consisting of conventional and digital resources of all published work of the scholars of NIT Meghalaya.
3. To provide the most user-friendly environment for teaching, learning, and research so that the Institute's Library becomes the center-piece of scholarly activities in the Institute system.
4. To offer user-centered information services and instrumental to advancing teaching, learning, and research.
5. To collaborate with faculty members in the joint enterprise of knowledge generation, organization, preservation, and effective dissemination.
6. To develop effective linkage mechanisms that enable the Library's clientele to access information in other knowledge institutions locally and internationally.

## Budgetary & Expenditure Details

The budget allocated for the Central Library for the FY 2021-22 is Rs. 1.5 Crore. The below table gives the detailed expenditure incurred on books, journals, newspapers, binding, etc. for 2021-22:

Year	Printed Books	Online Databases/e-Journals	Newspaper & Magazine etc
2020-21	----	14293502.00	20000.00

## Library Collections:

The central library collections consist of books, e-resources, theses, reports, and other reading materials in areas of science, engineering & technology, humanities, social sciences, and management. The total collection of the Library as of 31st March 2022 stands as follows:

Sl. No.	Name of Resources	Collection as on 31st March 2021
1	Printed Books	15404
2	E-books	5977
3	E-Databases/E-Journals	13
4	Books Bank (SC/ST)	1462
5	Theses	56
6	Magazines	4
7	Newspaper	8
8	Report/Annual Reports/Audit Reports	43

## Library Advisory Committee (LAC)

The function of the Library Advisory Committee is to support the functioning of the Library so that it can facilitate the library development plans by advocating the library development activities with the management. The purpose of the Library Advisory Committee is to act as a channel of communication and dialogue between the Institute library and its users. The committee's main objective is to aid in establishing a bridge between the Library and the academic fraternity and the Institute management. To get the feedback from all the Departments of the Institute, the members of LAC consists of all the representative of all the department.

## Area and Seating Capacity

Total Area of the Library is : 170 Sq. Meter

Seating capacity : 50

Library Hours:

The Institute library remains functional on all the working days except for few national and gazette holidays and remains open for 10 hours a day i.e. 9 AM to 7 PM.

## Services Provided

The Central Library of NIT Meghalaya provides the following services to its users:

1. Orientation Programme
2. Circulation Service
3. Information Literacy
4. User Education
5. Electronic Database and Online- Journals
6. OPAC (Online Public Access Catalogue)
7. Internet Facility
8. Reprographic Service
9. Bibliographic Services
10. Reference and information Services
11. Referral Services
12. Bulletin Board Service
13. Current awareness Services
14. User awareness services

# Permanent Campus

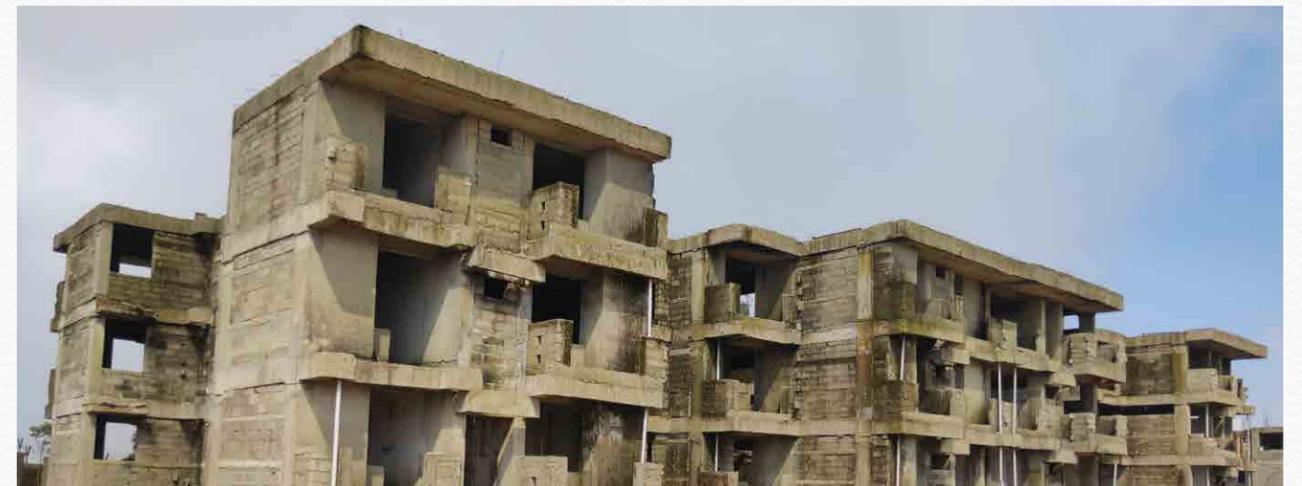
The construction activities in the permanent campus of the Institute have been making good progress till 2017-18 under the overall supervision of RITES Ltd, the Project Management Consultant (PMC) for the Phase-I constructions of the permanent campus of the Institute at Sohra (Cherrapunjee). As per RCE approved by the Cabinet and circulated vide Ministry letter F No.33-1/2012.TS-III dated New Delhi, 4th March 2020 an amount of Rs.429.70 crores has been earmarked for Civil Works. As per RCE approval, only the following buildings are to be completed in order of their priority, viz; Administrative Building, Academic Building (4 blocks), Hostel Buildings (Boys and Girls), Faculty & Staff Quarters, Library cum Computer Centre Workshop Building, Sub Station(ESS) Building (2 Nos). The other works/buildings, viz; Lecture Hall, Auditorium Building, Director's Bungalow, Guest House, Medical Centre,

Sports Complex, External Electrical works, etc. have been foreclosed.

The construction activities during 2020-21 have been going in a slow pace due to COVID-19 pandemic, law and order situation in Sohra area, restriction of migrant labourers by State Govt., etc. Internal road works & Fencing of Boys & Girls hostels is in progress. The construction of water storage reservoir inside the campus is also in progress. Overall physical progress of works undertaken by RITES Ltd. (PMC) is about 78%. The Institute re-scheduled shifting to the permanent campus by June 2023.

Attached herewith few photographs of ongoing works in the permanent campus.







## Implementation of the Right to Information Act, 2005:

In accordance with the provision of Section 5(2) of the Right to Information Act, 2005, NIT Meghalaya has appointed Shri Bantehsonglang Blahwar, Asst. Registrar (Establishment) as the Public Information Officer for the Institute. The Director is the designated First Appellate Authority of the Institute. The details of both have been clearly displayed on the Institute website under the RTI link.

As mandated under Section 4 (1) a) of the RTI Act, 2005, the Institute is moving towards complete digitization and computerization of information for easy access and quick response to RTI queries. The Institute is complying with the provisions of Section 4 (1) b) and Section 4 (2) and has provided suo motu all required information and documents on the Institute website. Annual Report and Statement of Annual Accounts are displayed as soon as they are approved by the parliament. Other documents like Minutes of Board of

Governors and Senate meetings are uploaded as soon as they are confirmed.

The Institute has been very prompt in replying to RTI queries, both received directly or forwarded from the Ministry. The Institute has been registered with RTI Request & Appeal Management Information System (RTI-MIS) portal and almost all RTI queries are received, replied and closed through the portal. The Institute is regularly submitting quarterly reports as required on the RTI-MIS portal. Quarterly reports of RTI queries received and closed are also uploaded regularly on the portal of the Central Information Commission, Govt. of India (dssic.nic.in).

A summary of the quarterly reports submitted on the RTI-MIS portal for the Financial Year 2021-22 is shown in the table below:

### Progress during Quarter (01/04/2021 - 30/06/2021)

	Opening Balance as on beginning of Quarter 1	No. of applications received as transfer from other PAs u/s 6(3)	Received during the Quarter (including cases transferred to other PAs)	No. of cases transferred to other PAs u/s 6(3)	Decisions where request/appeals rejected	Decisions where request/appeals accepted (Request dispose of and request return to applicant)
Requests	0	11	11	0	0	11
First Appeals	1	N/A	1	N/A	0	2

### Progress during Quarter (01/07/2021 - 30/09/2021)

	Opening Balance as on beginning of Quarter 1	No. of applications received as transfer from other PAs u/s 6(3)	Received during the Quarter (including cases transferred to other PAs)	No. of cases transferred to other PAs u/s 6(3)	Decisions where request/appeals rejected	Decisions where request/appeals accepted (Request dispose of and request return to applicant)
Requests	11	8	0	0	0	19
First Appeals	0	N/A	1	N/A	0	1

### Progress during Quarter (01/10/2021 - 31/12/2021)

	Opening Balance as on beginning of Quarter 1	No. of applications received as transfer from other PAs u/s 6(3)	Received during the Quarter (including cases transferred to other PAs)	No. of cases transferred to other PAs u/s 6(3)	Decisions where request/appeals rejected	Decisions where request/appeals accepted (Request dispose of and request return to applicant)
Requests	0	7	7	0	0	7
First Appeals	0	N/A	1	N/A	0	1

### Progress during Quarter (01/01/2022 - 31/03/2022)

	Opening Balance as on beginning of Quarter 1	No. of applications received as transfer from other PAs u/s 6(3)	Received during the Quarter (including cases transferred to other PAs)	No. of cases transferred to other PAs u/s 6(3)	Decisions where request/appeals rejected	Decisions where request/appeals accepted (Request dispose of and request return to applicant)
Requests	7	28	26	0	0	33
First Appeals	0	N/A	2	N/A	0	0

## Status of filling up of Backlog Vacancies during the year 2021-22 on Mission Mode:

The Economic Advisor (HE), Ministry of Education (MoE) had issued instructions to all Central Higher Education Institutions (CHEIs) regarding the Special Drive to fill backlog vacancies on Mission Mode vide Office Memorandum F.No.33-2/2021-TS.III (Pt-1) dated 25.08.2021 by enclosing a Letter No. D.O No. 33-2/2021-TS-111(Pt.I) dated 24.08.2021 from the Secretary, MoE to the different Bureau Heads. Through the said letter, the Secretary (HE) has informed that in order to fill the backlog vacancies for the faculty positions that are lying vacant, especially in the Scheduled Castes, Scheduled Tribes, Other Backward Classes and EWS categories in the CHEIs functioning under the administrative control of the MoE, it has been decided that all CHEIs should fill these vacancies in a Mission Mode within a period of one year starting from 05.09.2021 to 04.09.2022 and to report about the action taken and progress made in this regard through the following mechanism :-

(i) By including a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format during the year.

- (ii) By including an agenda item in every Finance Committee / Board of Governors / Board of Management meeting, giving status of filling up of backlog vacancies.
- (iii) The Heads of all CHEIs will send a monthly report to Secretary (HE) (starting from September 2021) appraising the status of action taken.
  - (A) To comply with the above-mentioned instructions of MoE, this chapter has been added to the Annual Report 2021-22.
  - (B) The matter was also placed before the Board of Governors (BoG) of the Institute in meetings held from 29.09.2021 onwards in which the BoG is appraised of the status of faculty recruitment and presented with brief action taken reports on the given points. The brief reports presented before the BoG in each meeting are furnished as under:-

**XXVIII Meeting of the BoG dated 29.09.2021**

Sl. No.	Ministry Instructions	Actions taken by NIT Meghalaya
1.	To include a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format during the year.	The Institute shall include a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format every year.
2.	To include an Agenda Item in every Board of Governors meeting, giving the status of filling up of backlog vacancies.	The Institute at present has 10 numbers of vacancies for Faculty out of which 07 are backlog vacancies and 03 are fresh vacancies. The 07 backlog vacancies are in reserved category i.e., 05 OBC and 02 SC. The Institute is in the process of filling up both the backlog vacancies and fresh vacancies shortly. A separate BoG Agenda Item No. 13 'Status of recruitment process for Faculty Members in NIT Meghalaya' has been kept for detailed information.
3.	The Heads of all CHEIs to send a monthly report to Secretary (HE) (starting from September 2021) appraising the status of action taken.	The Institute is regularly sending the monthly report to the Office of Higher Education (HE), Ministry of Education, appraising the status of action taken in filling up the backlog vacancies. The report for the month of August 2021 was sent on 03 September 2021 vide Letter No. NITMGH/ ES/ MHRD-RPT/FVS/2021-22/ 603 dated 03.09.2021

**XXIX Meeting of the BoG dated 10.12.2021**

Sl. No.	Ministry Instructions	Actions taken by NIT Meghalaya
1.	To include a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format during the year.	The Institute shall include a separate chapter in their Annual Report (from 2021-2022) depicting the status of filling up of backlog vacancies in tabular format every year.
2.	To include an Agenda Item in every Board of Governors meeting, giving the status of filling up of backlog vacancies.	The Institute at present has 07 (05 OBC and 02 SC) backlog vacancies and 03 fresh vacancies. The Institute is in the process of filling up both the backlog vacancies and fresh vacancies shortly.
3.	The Heads of all CHEIs to send a monthly report to Secretary (HE) (starting from September 2021) appraising the status of action taken.	The Institute is regularly sending the monthly report to the office of HE, MoE, about the backlog vacancies. The report for the month of November 2021 was sent on 03.12.2021 vide Letter No. NITMGH/ ES/ MoEd-RPT/ BV/2021-22/ 1131 dated 02.12.2021.

**XXX Meeting of the BoG dated 22.02.2022**

Sl. No.	Ministry Instructions	Actions taken by NIT Meghalaya
1.	To include a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format during the year.	The Institute shall include a separate chapter in their Annual Report (starting from 2021-22) depicting the status of filling up of backlog vacancies in tabular format every year.

Sl. No.	Ministry Instructions	Actions taken by NIT Meghalaya
2.	To include an Agenda Item in every Board of Governors meeting, giving the status of filling up of backlog vacancies.	The Institute at present has 10 numbers of vacancies for Faculty out of which 07 are backlog vacancies and 03 are fresh vacancies. The 07 backlog vacancies are in reserved category i.e., 05 OBC and 02 SC. The Institute is in the process of filling up both the backlog vacancies and fresh vacancies shortly. Scrutiny of the applications are over. The receipt of Visitor's nomination from MoE is awaited. The finalization of the new reservation policy by MoE is awaited.
3.	The Heads of all CHEIs to send a monthly report to Secretary (HE) (starting from September 2021) appraising the status of action taken.	The Institute is regularly sending the monthly report to the Office of Higher Education (HE), Ministry of Education, appraising the status of action taken in filling up the backlog vacancies. The report for the month of January 2022 was sent on 03 February 2022 vide Letter No. NITMGH/ ES/ MoEd-RPT/BV/2021-22/2578 dated 03.02.2022

(C) The Institute has been regularly sending the monthly report to the Department of Higher Education (HE), Ministry of Education, appraising the status of action taken in filling up the backlog faculty vacancies on Mission Mode. The letter number and date of submission of the monthly reports w.e.f. September 2021 onwards are presented below:

S. No.	Report for the month of	Letter No.	Dated
1.	September 2021	NITMGH/ES/MoEd-RPT/BV/2021-22/859	07.10.2021
2.	October 2021	NITMGH/ES/MoEd-RPT/BV/2021-22/983	05.11.2021
3.	November 2021	NITMGH/ES/MoEd-RPT/BV/2021-22/1131	02.12.2021
4.	December 2021	NITMGH/ES/MoEd-RPT/BV/2021-22/2399	06.01.2022
5.	January 2022	NITMGH/ES/MoEd-RPT/BV/2021-22/2578	03.02.2022
6.	February 2022	NITMGH/ES/MoEd-RPT/BV/2021-22/2834	08.03.2022
7.	March 2022	NITMGH/ES/MoEd-RPT/BV/2022-23/08	05.04.2022

**Status of Public Grievances received during the year 2021-22:**

As per mandate of the Government, NIT Meghalaya has appointed the following officer as the Public Grievance Officer to be the nodal point for redress of grievances received by the Institute in the form of letters or through the Centralised Public Grievance Redress and Monitoring System (CPGRAMS) portal:

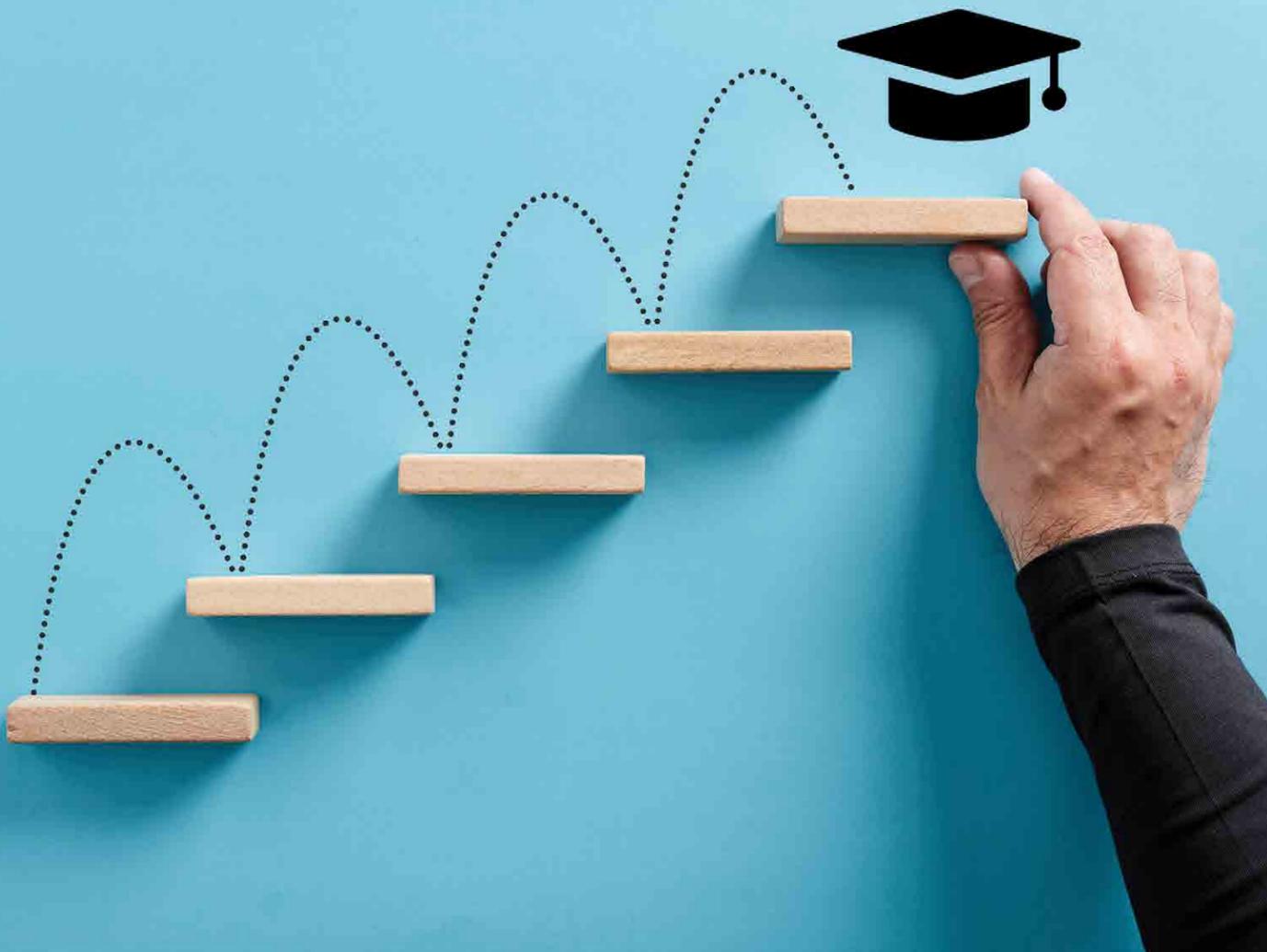
Shri Bantehsonglang Blahwar

Assistant Registrar (Establishment)

The Institute is registered with the CPGRAMS portal since the year 2015. The Institute has been prompt in replying to all grievances received till date. The details of the public grievances received, replied and closed in the year 2021-22 are shown in the table below:

Registration Number	Name	Received Date	Dairy Date	Current Status	Pending with	Grievance Redress Time (in days)	Dept./ Organisation Redress Time (in days)	Mode of Transfer	Type of grievance
DSEHE/E/2021/06802	Shakti Singh Chauhan	2021-10-02	2021-10-02	Final Closure	Grievance is closed.	19	19	NA	NA
DSEHE/E/2022/00890	Priyesh Singh	2022-02-06	2022-02-06	Final Closure	Grievance is closed.	8	8	NA	COVID-19 related

# ACADEMIC DEPARTMENTS AND CENTRES



## Department of Civil Engineering

### 1. Brief Introduction to the Department:

NIT Meghalaya's Civil Engineering department first began its session from July 2012. The Department, which has an intake capacity of 30 students, offers 4 years (eight semesters) B. Tech programme in Civil Engineering. Since 2014, the Department has initiated the Ph.D programme. Additionally, the department has started an M.Tech programme in Structural Engineering since July 2018 with an intake capacity for 20 students of which 15 students have enrolled in the programme.

The academic activities of the Department emphasize on deep understanding of the fundamental principles on Civil Engineering, development of creative ability to handle the challenges of Civil Engineering and the analytical ability to solve problems which are interdisciplinary in nature. The Department also encourages its students to engage in extra-curricular and co-curricular activities, essential for their own personal development apart from nurturing team spirit and developing organizational skills. The faculty members of the Department are involved in high-quality research and they continue to explore new frontiers of breakthrough technical knowledge, recent inventions and discoveries. The findings through these research on latest knowledge are being imparted to the students so that they are acquainted with the latest trends of the emerging engineering world. The Department actively promotes curriculum development activities by updating existing courses, develops new courses and prepares updated resource material for teaching. The Department also aims to contribute to interdisciplinary academic and research activities of NIT Meghalaya.

Moreover, the department also encourages both students and faculty members, along with all others concerned, in working for the development of Meghalaya, the North East region and the nation as a whole.

### Vision:

A Centre of Excellence of global repute in Civil Engineering education, research and consultancy by producing quality manpower and creating knowledge and technologies in these fields and contributing to the economic development of the region through extension activities.

### Mission:

- To impart quality education in the fields of Civil Engineering and allied areas through academic programs at both UG and PG levels.
- To carryout research for advancement of knowledge and development of technologies in the fields of Civil Engineering and allied areas for the benefit of the society.
- To participate in extension activities for the socio-economic development of the region.

### 2. Programmes Offered:

- Four year (Eight semester) B.Tech Degree with 30 intake capacity per year.
- Two year (Four semester) M.Tech Degree in Structural Engineering with 20 intake capacity.
- Ph.D. programme with the specialization of Structural, Geotechnical, Water Resources, Environmental and Transportation Engineering.

### 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance (ongoing)	Remarks
Dr. Comingstarful Marthong	Associate Professor	Ph.D	Structural Engineering	January 10, 2013	03 Ongoing	
Dr. M. Longshithung Patton	Assistant Professor	Ph.D	Structural Engineering	October 06, 2013	03 Ongoing	
Dr. Hriday Mani Kalita	Assistant Professor	Ph.D	Water Resources Engineering	August 12, 2014	01 Ongoing	
Dr. Smrutirekha Sahoo	Assistant Professor	Ph.D	Geotechnical Engineering	November 02, 2015	03 Ongoing	
Dr. Susmita Sharma	Assistant Professor	Ph.D	Geotechnical Engineering	May 10, 2016	02 Ongoing	
Dr. Debabrata Podder	Assistant professor	Ph.D	Structural Engineering	June 23, 2016	02 Ongoing	
Dr. Dibyendu Adak	Assistant Professor	Ph.D	Structural Engineering	January 03, 2018	03 Ongoing	
Dr. Ganesh Chandra Dhal	Assistant Professor	Ph.D	Environmental Engineering	September 24, 2019	02 Ongoing	
Dr. Pradeep Gautam	Assistant Professor	Ph.D	Transportation Engineering	October 14, 2019	01 Ongoing	
Dr. Needhi Kotoky	Assistant Professor	Ph.D	Structural Engineering	September 08, 2020	01 Ongoing	
Mr. Suman Kumar	Trainee Teacher	M.Tech	Structural Engineering	July 21, 2014	NA	Ph.D Pursuing (Served up to 06 Jan 2022)
Dr. Rubi Chakraborty	Trainee Teacher	Ph.D	Geotechnical Engineering	July 21, 2014	NA	
Mr. Supratim Kaushik	Trainee Teacher	M.Tech	Transportation Systems Engineering	July 20, 2015	NA	Ph.D Pursuing

### 4. Staff Profile:

Name	Designation	Qualification	Date of Joining	Nature of Job
Mr. Khlorsing Kharmih	Technical Assistant	Diploma in Engineering	July 14, 2014	Permanent
Mr. Skhembor Lyngdoh Mawphlang	Technical Assistant	Bachelor of Technology	March 01, 2016	Permanent
Mr. Gaddiel M Kharbithai	Technical Assistant	Diploma in Engineering	December 15, 2021	Permanent
Mr. Purnadip Roy	Technician	Diploma in Engineering	March 03, 2016	Permanent
Mr. Samuel Bennett	Technician	Diploma in Engineering & A.M.I.E	September 01, 2016	Permanent
Ms. Rita Mary Lyngdoh Marshilong	Technician	Diploma in Engineering & Bachelor of Technology	December 17, 2021	Permanent
Ms. Mary Bennett	Technician	Diploma in Engineering	December 21, 2021	Permanent
Ms. Dunakiwan I Lapasam	Laboratory Attendant	Bachelor of Technology	December 24, 2021	Permanent

Name	Designation	Qualification	Date of Joining	Nature of Job
Mr. Mainkumar Kharbuki	Technician	Master of Technology	October 26, 2018	Outsourced
Mr. Rahkumar Wanshnong	Technician	Bachelor of Technology	January 24, 2020	Outsourced

### 5. List of Publications:

#### a. Journals:

##### Year 2022:

1. Donkumar Francis Marbaniang, Teiborlang Warjri, **Comingstarful Marthong** (2022). Out-of-plane bending of masonry wall embedding with welded wire mesh (WWM) in different orientation, Innovative Infrastructure Solutions, 7:91 <https://doi.org/10.1007/s41062-021-00676-w>
2. **G C Dhal**, Evaluation of N doped rGO-ZnO-CoPc(COOH)<sub>8</sub> nanocomposite in cyanide degradation and its bactericidal activities, Journal of Environmental Management, Volume 302, Part A, 15 January 2022, 114022
3. **Chakraborty R**, Dey A. Probabilistic slope stability analysis: state-of-the-art review and future prospects. Innovative Infrastructure Solutions, 7, 177.
4. **Chakraborty R**, Dey A. Probabilistic assessment of seismic response of toe-excavated hillslopes retained using anchored sheet-pile-wall, Ain Shams Engineering Journal, 13 (5).

##### Year 2021:

1. GSR Reddy, M Bolla, **ML Patton, D Adak**. Comparative Study on Structural Behaviour of Circular and Square Section-Concrete Filled Steel Tube (CFST) and Reinforced Cement Concrete (RCC) Stub Column, Structures, Elsevier, Vol.-29, Page Nos 2067-2081, 2021. <https://doi.org/10.1016/j.istruc.2020.12.078>
2. KH Lepcha, **ML Patton**. Numerical study on structural behaviour of lean duplex stainless steel tubular beams with rectangular web openings, Structures, Elsevier, Vol.-32, Page Nos 1233-1249, 2021. <https://doi.org/10.1016/j.istruc.2021.01.08>
3. M. Anbarasu, Anjali Kumari Pravin Kumar Pandey, **ML Patton**, Hermes Carvalho. Testing and modelling of hot-rolled steel castellated hollow tubular beams, Structures, Elsevier, Vol.-34, Page Nos 4025-4040, 2021. <https://doi.org/10.1016/j.istruc.2021.10.003>
4. **S Sharma**, Microplastics in soils: An environmental geotechnics perspective, Journal of Environmental Geotechnics, 8(8):586-618
5. **S Sharma**, Post COVID-19 Water and Wastewater Management to Protect Public Health and Geoenvironment, Journal of Environmental Geotechnics, 8(3):193-207
6. **D Podder**, Damage detection in RC beam utilizing feed-forward backpropagation neural network technique, Asian Journal of Civil Engineering, Asian Journal of Civil Engineering, Vol: 22(2), P-1 to 11
7. **D Podder**, Experimental Investigations on Thermo Mechanical Tensioning (TMT), comparison with Heat Sink, and Its Application to a Grillage Structure, Journal of Ship Production & Design, Vol: 37(2), P-109 to 116
8. **Dibyendu Adak**, Donkumar Francis Marbaniang, Subhrajit Dutta, Experimental studies on the development of a self-healing cementitious matrix for repair and retrofitting of concrete structures, International Journal of Structural Integrity, 2021, 12(5) pp. 799-814.
9. Dodda Srinivas, Kruthi Kiran Ramagiri, Arkamitra Kar, **Dibyendu Adak**, Ehsan Noroozinejad Farsangi, Subhrajit Dutta, Experimental characterization of quaternary blended mortar exposed to marine environment using mechanical strength, corrosion resistance and chemical composition, Journal of Building Engineering, Volume 42, October 2021, 102822.
10. S. Das, S. Dutta, **D. Adak**, S. Majumdar, On the crack characterization of reinforced concrete structures: Experimental and data-driven numerical study, Structures, 2021, 30, 134-145
11. GSR Reddy, M Bolla, ML Patton, **D Adak**. Comparative Study on Structural Behaviour of Circular and Square Section-Concrete Filled Steel Tube (CFST) and Reinforced Cement Concrete (RCC) Stub Column, Structures, Elsevier, Vol.-29, Page Nos 2067-2081, 2021. <https://doi.org/10.1016/j.istruc.2020.12.078>
12. Fabio Freddi, Jayadipta Ghosh, **Needhi Kotoky** and Meera Raghunandan. (2021) "Device uncertainty propagation in low-ductility RC frames retrofitted with BRBs for seismic risk mitigation", Earthquake Engineering and Structural Dynamics, 1-22

13. **Chakraborty R**, Dey A. Hillslope instability induced by toe excavation: A comparative study of LEM-based deterministic and probabilistic approaches, *Sādhanā*, 46, 210.

## b. Book Chapters:

### Year 2022:

- Sahoo, S.** (2022). Meghalaya, In: Sanjay Kumar Shukla (Ed.), *Geotechnical Characteristics of Soils and Rocks of India* (1st Edition, January 2022, 744 pages, page nos: 473-488), Taylor & Francis Ltd, CRC Press. ISBN/Ean: 1032010983 / 9781032010984. <https://www.taylorfrancis.com/chapters/edit/10.1201/9781003177159-24/meghalaya-smrutirekha-sahoo?context=ubx&refId=324f688d-afae-4b88-bc23-8f6ba9ba67f9>
- Podder, D** Introduction to Structural Analysis, CRC Press, (ISBN: 978-0-367-53272-7)

## 6. Patents:

### Year 2021:

- Dr. D Adak**, Granted Australian Innovation Patent - HYDROPOD: LOW-COST, SCALABLE, AND CLOUD-ASSISTED HYDROPONICS SYSTEM, Patent No. – 2021102647

## 7. Conference / Workshop / Seminar Organized:

### Year 2021

- Dr. H M Kalita**, Online Short Term Course On Recent Applications Of CFD In Civil And Mechanical Engineering from 06<sup>th</sup> to 10<sup>th</sup> December 2021

### Year 2021:

- S Sharma**, Environmental Sustainability for Green Societies: The Impact of the COVID-19 Pandemic, Springer, (ISBN978-3-030-66492-3)

## c. Conferences:

### Year 2021:

- Singh, T., Swami, B. L., Kalla, P., Singh Chouhan, H., & **Kumar Gautam, P.** (2021). Effect of Nano Particle Based Anti-Stripping Agent on Moisture-Induced Damage for Bituminous Concrete Mixes. *IOP Conference Series: Earth and Environmental Science*, 795(1), 012037. <https://doi.org/10.1088/1755-1315/795/1/012037>
- Singh Chouhan, H., Singh Chouhan, R., Kalla, P., Nagar, R., & **Kumar Gautam, P.** (2021). Effect of Kota stone slurry on strength properties of cement mortar mixes. *Materials Today: Proceedings*, 44, 4557–4562. <https://doi.org/10.1016/j.matpr.2020.10.814>

## 8. Conferences / Workshops / Seminars / Trainings Attended by Faculty Members:

Sl. No.	Name of Faculty	Name of the programme attended	Duration
1.	Smt. R Chakraborty	Indo-Chile Workshop on Recent Advancements in Geotechnical Earthquake Engineering, organized by SRKR Engineering College, India, Indian Institute of Technology Roorkee, India and University of Chile, Chile	07-09 Sept, 2021
2.	Dr. P K Gautam	International Conference on "Advances in Construction Materials and Structures" held at St Thomas Institute for Science and Technology, Kerala, India	15-17 Dec 2021
3.	Dr. P K Gautam	International Conference on Sustainable Energy, Environment and Green Technologies held at Poornima College of Engineering, Jaipur, Rajasthan India.	5-6th March 2021

Sl. No.	Name of Faculty	Name of the programme attended	Duration
4.	Dr. G C Dhal	Participated in the workshop on "Integration of Building Heat Transfer in Engineering Curriculum" held online, sponsored by Indo-Swiss Building Energy Efficiency Project (BEEP), organized by the Department of Mechanical Engineering, IIT Bhubaneswar during 20 November 2021.	20th Nov 2021

## 9. Invited Talks Delivered:

### Year 2022

- Dr. Susmita Sharma**, International Conference on "Advances in Energy and Environment for Sustainable Development" January 7-8, 2022. In Virtual Platform Organized by Department of Chemistry Siksha 'O' Anusandhan (Deemed to be University) Bhubaneswar-751030, Odisha, In collaboration with Department of Civil Engineering National Institute of Technology Meghalaya, India.
- Dr. G C Dhal**, Invited Talk on Clean Fuels Technology & Health Effects" "Diesel Engine Emission, Effects, And Their Control Technologies" Neoteric Developments in Solid Waste Management 21st to 25th March 2022, NIT Arunachal Pradesh, Govt. of India.

### Year 2021

- Dr. S Sahoo**, Delivered a talk on 'CFD and Flow through porous media' during the online Short Term Course (STC) titled, "RECENT APPLICATIONS OF CFD IN CIVIL AND MECHANICAL ENGINEERING" from DECEMBER 6 - 10,

2021 conducted by Department of Civil Engineering and the Department of Mechanical Engineering, NIT Meghalaya.

- Dr. S Sahoo**, Delivered a talk on 'GEOTECHNICAL DESIGN OF DRIVEN PILES UNDER AXIAL LOADS' during the online FACULTY DEVELOPMENT PROGRAMME (FDP) ON Soft Computing Techniques in Geotechnical Engineering with Emphasis on Pile Foundations (14th March – 26th March 2022) Organized by Electronics & ICT Academy, NIT WARANGAL (Sponsored by Ministry of Electronics and Information Technology (MeitY), GOI in association with Department of Civil Engineering, Vardhaman College of Engineering, Hyderabad
- Dr. P K Gautam**, Expert Talk on "Sustainable use of mining waste as construction material" at five day online FDP on "Recent trend and advancement for sustainable development" 8-12 March 2022.
- Dr. P K Gautam**, Invited Talk on "Advance material testing for hot mix asphalt" at NIT Jaipur on 4.01.2022

## 10. Projects

### a. Sponsored Project:

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount	Duration	Status
1	Structural Integrity Assessment considering Residual/ Reactive stresses due to different welding configurations for high strength steel	Dr. D Podder	Naval Materials Research Laboratory, Ambarnath, (DRDO)	10 lakh	18 months	Ongoing
2	Developing Emission Inventory for Non-Attainment Cities of Meghalaya—Byranihat	Dr. G C Dhal	Center for Study of Science, Technology and Policy, Bangalore, India	02 Lakh	12 months	Ongoing

## b. Consultancy:

Sl. No.	Title	Consultants	Client(s)	Value	Status
1	Testing of construction materials, vetting of DPR, Design and vetting of structural design and drawings	C.Marthong, M.L.Patton, Dr. H.M.Kalita	Power Grid Corporation India, Tourism Dept., Govt. of Meghalaya, CPWD Shillong	76,90,740.3	Completed

## 11. Awards Won / Recognition received at the National and International level:

- Dr. S Sahoo**, "Young Woman Researcher in Geotechnical Engineering" by VIWA 2022 under Venus International Foundation, Chennai, India 05th March 2022.
- Dr. S Sahoo**, "Leading Woman Educationist & Researcher" Award under India's Most Prominent Women Empowerment Awards - 2022 from Merit Awards & Market Research (MAMR), 8th March 2022.
- Dr. S Sahoo**, "Outstanding Contribution towards S&T Application" by North East Centre for Technology Application and Reach (NECTAR), NIT Meghalaya, 8th March 2022.

## 12. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr. C Marthong	1. Dean Planning and Development	1 year
2	Dr. H M Kalita	1. HOD of CE Department from 01/07/2021, 2. Faculty incharge for the Hydrology and Water Resources Engineering Laboratory	1 year
3	Dr. S Sahoo	1. Faculty-in-charge of Geotechnical Engineering Laboratory	1 year
		2. Faculty-in-charge of Engineering Geology Laboratory	1 year
		3. Member of Centre for Innovation, Incubation and Entrepreneurship, NIT Meghalaya	1 year
		4. Faculty-in-charge of Music Club of Student Activity Centre, NIT Meghalaya	1.5 years
		5. Warden of Lapalang Girls Hostel, NIT Meghalaya	1 year
		6. Convenor of the Committee for the compilation and publication of Institute's achievements from May 2017 to till date	5 months
		7. Organising Committee Member of the Industry Academia Conclave, 2022 on "Future perspective of Technological Development" organized by National Institute of Technology Meghalaya from 18th to 23rd February, 2022	1 year
4	Dr. P K Gautam	1. Warden, Lapalang-1 Boys Hostel	1 year
		2. Faculty in charge, Transportation Lab, Survey Lab and Engineering Drawing Lab	1.5 years
		3. Convenor for MOU between NHA and NIT Meghalaya	2 years
5	Dr. G C Dhal	1. Faculty in charge Engineering Drawing	1 year
		2. Faculty in charge Engineering Solid Mechanics Lab	1 year
		3. Faculty in charge Environmental Engineering Lab	1 year
		4. Institute of Repute (IoR) and nominated representatives for National Clean Air Mission	2 years

## 13. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. S Sahoo	Life member of IGS, Membership for the period of 2018-2021 of ISSMGE
2	Dr. C. Marthong	Life member of Institution of Engineers India, No. M-1476399
3	Dr. D Podder	Associate Member (ID: AM186488-5), The Institute of Engineers (India).
		Associate Member (ID: 11855874), American Society of Civil Engineers.
4	Rubi Chakraborty	Life member of IGS, Membership for the period of 2018-2021 of ISSMGE
5	Suman Kumar	Member, The IEI, M-1716144
6	Supratim Kaushik	American Society of Civil Engineers (ASCE)
7	Dibyendu Adak	Associate member of ASCE
		Life member of Institution of Engineers India
8	Rubi Chakraborty	Life membership in IGS, Membership of ISSMGE
9	Dr. G C Dhal	Life membership in the Indian Meteorological Society. (LM-3579)

## 14. Any Other Notable Information:

The Department faculty also involved in service as requested by other organization as mentioned below:

Faculty	Extension Activity	Role	Contributions
Dr. C Marthong	BoG member of Captain Williamson Sangma Technical University, Meghalaya	BoG member nominated by Honourable Govt. of Meghalaya	Advisory member regarding Administration and Academic affairs of Captain Williamson Sangma Technical University, Meghalaya

# Department of Computer Science and Engineering

## 1. Brief Introduction to the Department:

The Department of CSE at NITM has adequate facilities to support each activity needed for a batch of 30 students (per semester). It has a well-qualified and experienced faculty team consisting of 9 faculty members. The Computer Science & Engineering department makes all efforts in imparting high quality education to its motivated students. One of the aims

of this department is to play its role of producing Computer Engineers ready to satisfy the needs of the Computer and IT world. The Department is also actively involved in various research activities.

## 2. Programmes Offered:

The Department of Computer Science & Engineering offers the B.Tech programme, the full-time M.Tech. programme and the Ph.D. programme (full-time and part-time).

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance
Dr. Diptendu Sinha Roy	Associate Professor	Ph.D.	Distributed, Grid and Cloud Computing	01-07-2016	2- Full time 4- Part time
Dr. Alok Chakrabarty	Assistant Professor	Ph.D.	Pattern Recognition	20-06-2012	2- Full time 1- Part time
Dr. Akhilendra Pratap Singh	Assistant Professor	Ph.D.	Service Oriented Network Architecture, Computer Network, Wireless Sensor Network	03-09-2013	2- Full time 5- Part time
Dr. Surmila Thokchom	Assistant Professor	Ph.D.	Cloud Computing, cryptography	26-09-2012	1- Full time 2- Part time
Dr. Deepak Kumar	Assistant Professor	Ph.D.	Computational Arithmetic, Machine Learning	20-12-2012	2- Full time 4- Part time
Dr. Yogita	Assistant Professor	Ph.D.	Data Mining	08-01-2018	2- Full time 2- Part time
Dr. Vipin Pal	Assistant Professor	Ph.D.	Computer Networks, Wireless Sensor Networks	28-12-2017	3- Full time
Dr. Soumen Moulik	Assistant Professor	Ph.D.	Wireless Body Area Networks, Wireless Sensor Networks, Internet of Things	15-12-2017	2- Full time 1- Part time
Dr. Bunil Kumar Balabantaray	Assistant Professor	Ph.D.	Computer Vision, Robotics	14-12-2017	1- Full time 3- Part time

## 4. List of Publications:

### (a) Journals:

- Mir Wajahat Hussain, Mohammad S. Khan, K. Hemant Kumar Reddy, Diptendu Sinha Roy Extended indirect controller-legacy switch forwarding for link discovery in hybrid multi-controller SDN Computer Communications 189 148-157 2022
- Susovan Chanda, Ashish Kumar Luhach, Waleed Alnumay, Indranil Sengupta, Diptendu Sinha Roy A lightweight device-level Public Key Infrastructure with DRAM based Physical Unclonable Function (PUF) for secure cyber physical systems Computer Communications 190 87-98 2022
- Ajj, M., Pratihari, S., Roy, D.S. et al. Robust Detection of Tables in Documents Using Scores from Table Cell Cores SN COMPUT161 2022
- B. Dande, C. -Y. Chang, W. -H. Liao and D. S. Roy MSQAC: Maximizing the Surveillance Quality of Area Coverage in Wireless Sensor Networks IEEE Sensors Journal 22 6150-6163 2022
- Q. Zhang, C. -Y. Chang, Z. Dong and D. S. Roy TCSAR: Target Coverage Mechanism for Sensors With Adjustable Sensing Range in WRSNs IEEE Sensors Journal 22 3756-3765 2022
- Pradhan, Nihar Ranjan, Singh, Akhilendra Pratap, Panda, Kaibalya Prasad and Roy, Diptendu Sinha A novel Confidential Consortium Blockchain framework for peer to peer energy trading, International Journal of Emerging Electric Power Systems, 2021
- N. R. Pradhan, A. P. Singh, N. Kumar, M. M. Hassan and D. S. Roy A Flexible Permission Ascription (FPA)-Based Blockchain Framework for Peer-to-Peer Energy Trading With Performance Evaluation, IEEE Transactions on Industrial Informatics (18) 2465-2475, 2022.
- W. Wen, C. -Y. Chang, S. -J. Wu and D. S. Roy CORL2: Exploring Cooperative Opportunities, Reducing Latency and Prolonging Network Lifetime for Data Collection Using Mobile Sinks in Wireless Sensor Networks IEEE Sensors Journal 21 19596-19610 2021
- Ajj, M., Pratihari, S., Nayak, S. R., Hanne, T., & Roy, D. S. Off-line signature verification using elementary combinations of directional codes from boundary pixels, Neural Computing and Applications 1-18 2021
- Renuka, K., Roy, D. S., & Reddy, K. H. K. An SDN empowered location aware routing for energy efficient next generation vehicular networks IET Intelligent Transport Systems 308-19 2021
- Utkarsh Saxena, Soumen Moulik, Soumya Ranjan Nayak, Thomas Hanne, Diptendu Sinha Roy Ensemble-Based Machine Learning for Predicting Sudden Human Fall Using Health Data Mathematical Problems in Engineering 12 2021
- W. -B. Yang, C. -H. Sun, D. S. Roy and Y. -M. Chen Asynchronous Digital Low-Dropout Regulator With Dual Adjustment Mode in Ultra-Low Voltage Input IEEE Access 9 157563-157570 2021
- Y. Kan, C. -Y. Chang, C. -H. Kuo and D. S. Roy Coverage and Connectivity Aware Energy Charging Mechanism Using Mobile Charger for WRSNs IEEE Systems Journal, 2021
- Pradhan, B., Srivastava\*, G., Roy, D. S., Reddy, K. H. K., & Lin, J. C. W. Traffic Classification in Underwater Networks using SDN and Data-Driven Hybrid Metaheuristics ACM Transactions on Sensor Networks (TOSN) 2021
- Wang, A., Zhao, S., Keh, H. C., Chen, G., & Roy, D. S. Towards a Clustering Guided Hierarchical Framework for Sensor-Based Activity Recognition Sensors, 21, 6962, 2021
- Nalluri, M. R., Kannan, K., & Roy, D. S. A Novel Discrete Firefly Algorithm for Constrained Multi-Objective Software Reliability Assessment of Digital Relay Machine Vision Inspection Systems 2 287-321 2021
- H. Yu, C. -Y. Chang, Y. Wang, D. S. Roy and X. Bai CAERM: Coverage Aware Energy Replenishment Mechanism Using Mobile Charger in Wireless Sensor Networks, IEEE Sensors Journal 21 23682-23697 2021
- Hussain, M. W., REDDY, K. H., & Roy, D. S. A counter based approach for reducer placement with augmented Hadoop rack awareness Turkish Journal of Electrical Engineering & Computer Sciences 29 437-453 2021
- Buddhadeb Pradhan, Nirmal Baran Hui, Diptendu Sinha Roy, Gautam Srivastava, and Jerry Chun-Wei Lin Game-Theoretic Strategic Coordination and Navigation of Multiple Wheeled Robots ACM Trans. Internet Technol 21 15 2021
- W. Wen, C. -Y. Chang, S. -J. Wu and D. S. Roy CORL2: Exploring Cooperative Opportunities, Reducing Latency and Prolonging Network Lifetime for Data Collection

- Using Mobile Sinks in Wireless Sensor Networks IEEE Sensors Journal 21 19596-19610 2021
21. B. Dande, S. -Y. Chen, H. -C. Keh, S. -J. Yang and D. S. Roy Coverage-Aware Recharging Scheduling Using Mobile Charger in Wireless Sensor Networks IEEE Access 9 87318-87331 2021
  22. N. A. Choudhury, S. Moulik and D. S. Roy Physique-Based Human Activity Recognition Using Ensemble Learning and Smartphone Sensors IEEE Sensors Journal, 21, 16852-16860, 2021
  23. P. Parida, C. Pradhan, X. -Z. Gao, D. S. Roy and R. K. Barik Image Encryption and Authentication with Elliptic Curve Cryptography and Multidimensional Chaotic Maps IEEE Access, 9, 176191-76204, 2021.
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  36. Anju Yadav, Udit Thakur, Rahul Saxena, Vipin Pal, Vikrant Bhateja and Jerry Chun-Wei Lin "AFD-Net: Apple Foliar Disease Multi Classification using Deep Learning on Plant Pathology Dataset", *Plant and Soil An International Journal onPlant-SoilRelationships*, 2022.
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  38. Anju Yadav, Bhavna Saini, Vivek K. Verma, Vipin Pal, "A joint medical image compression and encryptionusing AMBTC and hybrid chaotic system", *Journal of Discrete Mathematical Sciences and Cryptography*, 2021.
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  45. C. Lalengmawia and A. Chakrabarty, "Mapping Quantum Circuits in IBM Q Devices using Progressive Qubit Assignment for Global Ordering," *New Generation Computing*, Mar 2022, <https://doi.org/10.1007/s00354-022-00163-5>.
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- (b) Book Chapters:**
1. R. Nayak and Bunil K Balabantaray, 2021, Generative Adversarial Network for Heritage Image Super Resolution, Book: *Computer Vision and Image Processing*, Springer Singapore, CCIS 1377 ISBN: 978-981-16-1086-8 2021
  2. R. Hansda, R. Nayak and Bunil K Balabantaray, 2021, Copy-Move Image Forgery Detection Using Spatio-Structured SIFT Algorithm, Book: *Computer Vision and Image Processing*, Springer Singapore, CCIS 1376, ISBN: 978-981-16-1086-8. 2021
  3. R. Nayak and Bunil K Balabantaray, 2021, MoBMGAN: Modified GAN based Transfer learning for automatic detection of COVID-19 cases using Chest X-ray Images, Book: *Computational Modelling and data Analysis in COVID-19 Research*, CRC Press, ISBN: 9780367680367
4. S. Ch. Barik, S. Mohapatra, B. Das, M. Acharaya, B. K. Balabantaray, 2021, Advanced Colored Image Encryption Method in Using Evolution Function, *Advances in Machine Learning and Computational Intelligence*, Springer, pp: 869-878.
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  6. Das, B., Swain, D., Balabantaray, B.K., Hansda, R. and Shukla, V., 2021. Copy-Move Forgery Detection Using Scale Invariant Feature Transform. In *Machine Learning and Information Processing* (pp. 532-521). Springer, Singapore.
  7. Venkata Bhargava Narendra, V., Rangababu, P. and Balabantaray, B.K., 2021. Low-Power U-Net for Semantic Image Segmentation. In *Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication* (pp. 491-473). Springer, Singapore.
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  10. Pawan Kumar Sharma, Jaspreet Singh, Yogita, Vipin Pal "Smart Sensor Networks Using AI for Industry 4.0/Low Power Communication in Wireless Sensor Networks and IoT", Taylor and Francis, 2021.
- (c) Edited Book:**
1. Galety, M.G., Al Atroshi, C., Balabantaray, B. and Mohanty, S.N. eds., 2022. *Social Network Analysis: Theory and Applications*. John Wiley & Sons.
- (d) Conferences: (International):**
- 1) Mudali, G., Priyadarshini, R., Kandpal, M., Barik, R. K., & Roy, D. S. (2022). Mist Assisted Cloud Computing Framework for Prediction of Hypertension Attack. In *Intelligent Systems* (pp. 677-685). Springer, Singapore.

- 2) Tripathy, S. S., Mishra, K., Barik, R. K., & Roy, D. S. (2022). A Novel Task Offloading and Resource Allocation Scheme for Mist-Assisted Cloud Computing Environment. In *Intelligent Systems* (pp. 103-111). Springer, Singapore.
- 3) Choudhury, S., Karthik Pai, B. H., Hemant Kumar Reddy, K., & Roy, D. S. (2022). A Hybrid CNN Real-Time Object Identification and Classification Approach for Autonomous Vehicles. In *Intelligent Systems* (pp. 485-497). Springer, Singapore.
- 4) Hussain, M. W., & Sinha Roy, D. (2022). Intelligent Node Placement for Improving Traffic Engineering in Hybrid SDN. In *Advances in Communication, Devices and Networking* (pp. 287-296). Springer, Singapore.
- 5) Tripathy, S. S., Barik, R. K., & Roy, D. S. (2022). Secure-M2FBalancer: A Secure Mist to Fog Computing-Based Distributed Load Balancing Framework for Smart City Application. In *Advances in Communication, Devices and Networking* (pp. 277-285). Springer, Singapore.
- 6) P. Sharma, A. Goutam, R. Nayak, B. K. Balabantaray, "Melanoma Detection using Advanced Deep NeuralNetwork", 4<sup>th</sup> IEEE ICEPE, NIT Meghalaya, March 2022.
- 7) R. Hansda, R. Nayak and B.K. Balabantaray, Copy-Move Image Forgery Detection via Combined Pseudo-Zernike Moment Invariants, 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies, IEEE, 2021.
- 8) Balabantaray, B.K., Chakravarty, R., Panda, A.K. and Nayak, R., 2021. Melanoma Classification Through Transfer Learning by the Analysis of Skin Lesion Images. In *Proceedings of the International Conference on Computing and Communication Systems* (pp. 413-403). Springer, Singapore.
- 9) Hansda, R., Nayak, R. and Balabantaray, B.K., 2021, March. Copy-move image forgery detection via combined pseudo-zernike moment invariant. In *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies* (pp. 6-1). IEEE.
- 10) Pradhan, A.K., Rout, J.K., Maharana, A.B., Balabantaray, B.K. and Ray, N.K., 2021, December. A Machine Learning Approach for the Prediction of Fetal Health using CTG. In *2021 19th OITS International Conference on Information Technology (OCIT)* (pp. 244-239). IEEE.
- 11) Pranab Das, Jerry W Sangma, Vipin Pal, Yogita "Predicting Adverse Drug Reactions from Drug Functions by Binary Relevance Multi-label Classification and MLSMOTE", 15th International Conference on Practical Applications of Computational Biology & Bioinformatics, 2021.
- 12) Yogita, Vipin Pal "Data Variance based Distributed Outlier Detection in Wireless Sensor Networks", International Conference on Computational Electronics for Wireless Communications, June,11- 12, 2021
- 13) Mangal Singh; Saurav Gupta; Satyendra Singh Yadav; Vipin Pal; Sarat Kumar Patra "Performance Evaluation of Visible Light Communication System based on Optical Power Distribution with Channel Delay Spread and SNR", Advanced Communication Technologies and Signal Processing (ACTS), 2021.
- 14) Singh, T.D., Singh, T.J., Shadang, M., Thokchom, S. (2021). Review Comments of Manipuri Online Video: Good, Bad or Ugly. In: Maji, A.K., Saha, G., Das, S., Basu, S., Tavares, J.M.R.S. (eds) Proceedings of the International Conference on Computing and Communication Systems. Lecture Notes in Networks and Systems, vol 170. Springer, Singapore. [https://doi.org/10.1007/978-981-33-4084-8\\_5](https://doi.org/10.1007/978-981-33-4084-8_5)
- 15) N. N. Devi and S. Thokchom, "Multi-attribute based prosumers prioritization for energy trading in Smart Grid," *2021 IEEE 18th India Council International Conference (INDICON)*, 2021, pp. 1-6, doi: 10.1109/INDICON52576.2021.9691544.
- 16) Mohammadi, Z., Pinto, S.J., Panda, G., Thokchom, S. (2022). A Survey of Cyber Security in Smart Microgrid. In: Panda, G., Naayagi, R.T., Mishra, S. (eds) Sustainable Energy and Technological Advancements. *Advances in Sustainability Science and Technology*. Springer, Singapore. [https://doi.org/10.1007/978-981-16-9033-4\\_51](https://doi.org/10.1007/978-981-16-9033-4_51)
- 17) T. T. Mengistie and D. Kumar, "Comparative Study of Transfer Learning techniques for Lung Disease prediction," 2021 10th International Conference on Internet of Everything, Microwave Engineering, Communication and Networks (IEMECON), Jaipur, India, 1-2 December 2021, pp. 1-6, doi: 10.1109/IEMECON53809.2021.9689159.
- 18) T. T. Mengistie and D. Kumar, "Deep Learning Based Sentiment Analysis On COVID-19 Public Reviews," 2021 International Conference on Artificial Intelligence in Information and Communication (ICAIC), Korea, 13-16 April 2021, pp. 444-449, doi: 10.1109/ICAIC51459.2021.9415191.

## 5. Conference / Workshop / Seminar Organized:

- (a) Dr. Diptendu Sinha Roy, Societal Applications of Artificial Intelligence, AICTE sponsored 5-day STTP, NIT Meghalaya, Shillong 22-26 March, 2021.
- (b) Dr. S. Thokchom organised the 3rd Research Conclave, NIT Meghalaya during 28th Feb-1st March 2022, as Convenor.
- (c) Dr. Alok Chakrabarty organized a five-days workshop titled "Modern software development using Android ecosystem, Django and the like in AI-enabled Cloud and IoT era" at NIT Meghalaya during 27-31 Aug 2021, sponsored by CSI.

## 6. Conferences / Workshops / Seminars / Trainings Attended by Faculty Members:

Sl. No.	Name of Faculty	Name of the programme attended	Duration
1	Bunil Kumar Balabantaray	NVIDIA GTC-2022	21.03.2022 to 25.03.2022
2	Deepak Kumar	International Conference on Artificial Intelligence in Information and Communication (ICAIC), Korea,	13-16 April 2021
3	Deepak Kumar	10th International Conference on Internet of Everything, Microwave Engineering, Communication and Networks (IEMECON), Jaipur, India,	1-2 December 2021

## 7. Invited Talks Delivered:

Sl. No.	Title	Type	Event/Place	Any other information
1	Cyber Image Analysis	FDP	CET, Bhubaneswar	Speaker: Bunil Kumar Balabantaray
2	Image Forgery using ML	Short Term Course	RITE, Bhubaneswar	Speaker: Bunil Kumar Balabantaray
3	IOT Based Smart Healthcare Monitoring System-2022	National Hybrid Seminar	CoEB, Bhubaneswar	Speaker: Bunil Kumar Balabantaray
4	Image Forgery and Obscene content classification using DL	AICTE sponsored STTPon Emerging Information and Cyber Security Trends	NIT Arunachal Pradesh	Speaker: Bunil Kumar Balabantaray 21 - 25 March 2022
5	"Cloud Security"	STC	STC on "Cloud, Fog and Edge Computing" From 13.09.2021 to 17.09.2021 O. Plan No. (ICT-CSE-12) Organized by Department of Computer Science and Engineering NITTTR, Chandigarh	Speaker: S. Thokchom

Sl. No.	Title	Type	Event/Place	Any other information
6	"Cloud Security"	STTP	STTP on Cloud Computing from 6th September 2021 to 12 September 2021 under AICTE-ISTE sponsorship, organized by Department of Computer Science and Engineering, DRIEMS, Odisha	Speaker: S. Thokchom
7	"Cloud Security"	Workshop	"Recent Trends in Computer Applications in Academia and Industry" during 21st – 25th, February 2022, organized by Department of Computer Science and Engineering, Tezpur University.	Speaker: S. Thokchom
8	a) Portable Software Development using JDK and ApacheDerby - Part I, b) Portable Software Development using JDK and ApacheDerby - Part II	Technical talk	In workshop titled "Modern software development using Android ecosystem, Django and the like in AI-enabled Cloud and IoT era"	Organized at NITMeghalaya, Shillong, Meghalayaduring 27-31Aug 2021 Speaker: Dr. Alok Chakrabarty

## 8.Sponsored Projects:

Sl No.	Title of the Project	Investigators (PI/Co.-PI)	Funding Agency	Funding Amount	Duration	Status
1	Design and development of intelligent algorithms for analysis and detection of obscene content and forgery in the images available on social media.	PI: Bunil Kumar Balabantaray	Cyber Crime Prevention against Women & Children (CCPWC), BPR&D, scheme of Ministry of Home affairs, Govt. of India.	21.888 lakhs	2 years	Completed by March 2022
2	A deep learning approach for the preservation of cultural heritage.	PI: Bunil Kumar Balabantaray	SERB, Department of Science and Technology (DST)	23,91,345 lakhs	3 years	Ongoing
3	Development of hybrid AI-powered attacks and its intelligent counter-measure mechanisms	PI: Bunil Kumar Balabantaray	Cyber Security Division, Ministry of Electronics & Information Technology, Government of India	36.404 lakhs	3 years	Ongoing
4	GAN based synthetic medical image generation	PI: Bunil Kumar Balabantaray	Hardware Grant, NVIDIA, India	10.00 Lakhs	-	Continuing
5	Cloud-assisted Data Analytics based Real-Time Monitoring and Detection of Water Leakage in Transmission Pipelines using Wireless Sensor Network for Hilly Regions	Co-PI : Yogita PI: Vipin Pal	NMHS	44 Lakh	2018-21	Ongoing

Sl No.	Title of the Project	Investigators (PI/Co.-PI)	Funding Agency	Funding Amount	Duration	Status
6	A Machine Learning Framework for Deploying Mobile Edge Clouds for Real-Time Analytics on IoT Data over 5G	Co-PI : Vipin Pal	MEITY	45 Lakh	2021-2024	Ongoing
7	Development of low cost cloth squeezing and dryingmachine for common people	PI: Dr. Alok Chakrabarty	TEQIP-III	1.85 lakhs	March'21 to March'22	Completed
8	Design and Analysis of Approximate Computer Arithmetic Algorithms	PI: D. Kumar	TEQIP-III	2 lakhs	February '21 to March'22	Completed

## 9. Laboratories Setup:

Sl. No.	Laboratory	Major Equipment& Software	Location	Cost (Rupees)
1	Computer vision and machine learning (CVML Lab)	2 servers Server 1: 3 NVIDIA TITAN RTX Server 2: 1 NVIDIA Quadro RTX 6000	NIT Meghalaya	Nearly 1 Cr

## 10. Administrative Responsibilities Held:

Sl.No.	Name of Faculty	Responsibilities	Duration
1	Dr. Yogita	Head of Department	Since July, 2019 to till date
2	Dr. Soumen Moulik	Faculty in-charge, Music Club	5th Sep. 2019 – 17th Feb. 2022
		Warden, Polo Boys' Hostel	1st July 2019 - Present
		Coordinator, Department Ph.D. Activities	June 2018 – Present
		Faculty in-charge, Department Syllabus Committee	Nov. 2019 – Present
3	Dr. Bunil Kumar Balabantaray	Warden, Kench Trace Hostel	July 2018 - Present
		Coordinator, CCMT and CCMN	CCMT and CCMN admission
		Member, Institute Innovation Council	October-2020 - Present
		Member, CIIE, NIT Meghalaya	
4	Dr. Deepak Kumar	Member, TBI (section 8 Company, NIT Meghalaya)	January 2022 - Present
		Member, DRC	Dec 2020 to Dec 2022
		Liaison Officer for OBC	15-01-2022 to 14-01-2024
		Member, Time Table Committee	June 2021 to June 2023
		Convener, Procurement committee	March 2022 to March 2023

Sl.No.	Name of Faculty	Responsibilities	Duration
5	Dr. Vipin Pal	Convener, Ranking and Accreditation	Sep, 2018 to Till Date
		Member, Institute Information Committee	July, 2019 to Till date
		Member, ICT Work at Permanent Campus Committee	Sep, 2021 to till date
6	Dr. Surmila Thokchom	PIC (PG & R)	Since 1st July 2021
		Nodal Officer, AISHE	
7	Dr. Akhilendra Pratap Singh	Chairman (Innovation & Entrepreneurship Club) (To enhance the in house entrepreneurial mentor capacity of HEI's)	2020-2022
		Faculty-In-charge, EBSB Club (To manage the student activity)	2022
8	Dr. Alok Chakrabarty	Faculty Advisor	April 2021-March 2022

## 11. Membership of Professional Bodies:

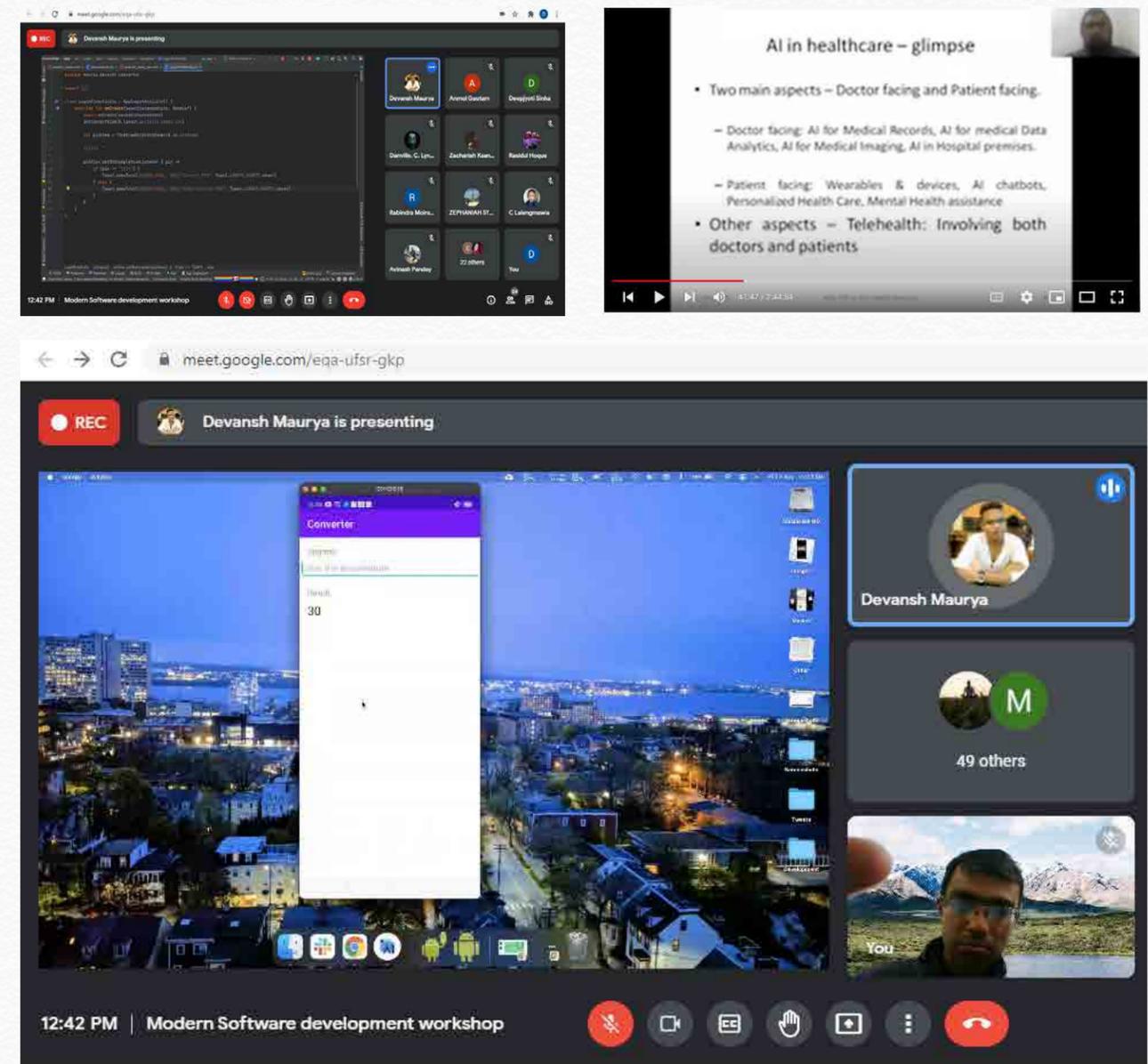
Sl. No.	Name of Faculty	Member of
1	Dr. Diptendu Sinha Roy	Senior Member (IEEE), CSI (Life Member), ISTE (Life Member), Member ACM
2	Dr. Alok Chakrabarty	IEEE, CSI, ACM
3	Dr. Akhilendra Pratap Singh	CSI (LifeMember), ISTE (LifeMember)
4	Dr. Yogita	Senior Member IEEE
5	Dr. Vipin Pal	Senior Member IEEE
6	Dr. Bunil Kumar Balabantaray	ISTE(LM), Soft Computing Research Society, India. Associate Member (UACEE), Institute of Research Engineers and Doctors, (Membership No:AM10100057923), Member: IEEE and IEEE EMBS Society Member, IEEE CS
7	Dr. Surmila Thokchom	ACM, IEEE
8	Dr. Soumen Moulik	IEEE
9	Dr. Deepak Kumar	IEEE

## 12. Any other Notable Information:

- Dr. Bunil Kumar Balabantaray served as editor, Special Issue: The Significance of Machine Learning for COVID-19, International Journal of Computer Applications in Technology, Inderscience
- Dr. Bunil Kumar Balabantaray was session chair, ICEPE 2022, NIT Meghalaya, Shillong, Meghalaya
- Dr. Bunil Kumar Balabantaray was subject Expert for the junior cyber expert recruitment for CID, Meghalaya Police.

## 13. CSE Department activities in Photographs:

Three figures about workshop "Modern software development using Android eco-system, Django and the like in AI-enabled Cloud and IoT era" conducted by the CSE Department at NIT Meghalaya during 27-31 Aug 2021, sponsored by CSI are as follows:



# Department of Electrical Engineering

## 1. Brief Introduction to the Department:

The Department of Electrical Engineering started since the inception of NIT Meghalaya. Presently the department offers B.Tech, M.Tech and Ph.D. Programs. The B. Tech program started in 2010 with an intake of 30 students at NIT Surat and from 2014 onward M.Tech program has been started with an intake of 20 students offering specialization in Power & Energy Systems. Presently there are full-time and part-time research scholars, registered for the Ph.D. program in diverse specializations. The Department aims to impart high-quality education to the students and carry out fundamental and industry-oriented research work. The research interest of faculties encompasses various areas of electrical engineering such as Power system Control, Smart Grid Technology, Synchrophasor Technology, Power Quality and Renewable energy integration to the grid, Power Electronics & Drives, Control Systems and Instrumentation, Signal Processing and Biomedical Instrumentation, High Voltage Engineering, etc. The department has well-equipped laboratory facilities for the students such as Basic Electrical Engineering Lab, Electrical Machine Lab, Network and Systems Lab, Digital Electronics Lab, Power System Lab, Computational Lab,

Control & Instrumentation Lab, Power Electronics Lab, Electric Drives Lab, Microprocessor Lab, Microcontroller & Embedded Systems Lab. Specialized simulation software like Matlab, Simulink, FLUX, PSPICE, PSIM, PSS@E, EMYP etc. is available with the department to carry out experiments and research activities. Besides, the faculty of the EE department is very actively publishing papers in reputed journals and conferences such as IEEE, IET, Elsevier, Springer, Taylor and Francis, Wiley, etc. Moreover, faculty members of the EE department have received several sponsored research projects from various agencies like SERB-DST, CPRI, REC, and the State Council of Science Technology & Environment (SCSTE, Govt. of Meghalaya).

## 2. Programmes Offered: Currently, the Department is offering

- B.Tech in EEE
- M.Tech in Power & Energy Systems (Full-Time as well as Sponsored Part-Time)
- Ph.D. in various Specializations (Full-Time as well as Part-Time)

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. Guiding (Ongoing)	Guided/ Thesis Submitted
Dr. S. Debbarma	Assistant Professor	B.E, M.Tech, Ph.D	Power Systems	19 June 2012	04	01
Dr. P. P. Singh	Assistant Professor	B.Tech, M.Tech, Ph.D	Control Systems	31 May, 2016	02	0
Dr. Rakesh Roy	Assistant Professor	B.E, M.Tech, PhD	Power Electronics & Electric Machine Drives	03 January 2013	03	0

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. Guiding (Ongoing)	Guided/ Thesis Submitted
Dr. Shaik Affijulla	Assistant Professor	B.Tech, M.Tech, Ph.D	Power Systems	03 January 2013	04	0
Dr. Ksh Milan Singh	Assistant Professor	B.Tech, M.Tech, Ph.D	Instrumentation and Signal Processing	24 May 2016	03	0
Dr. Atanu Banerjee	Associate Professor	B.E, M.Tech, PhD	Power Electronics & Drives	25 August, 2014	07	03
Prof. Gayadhar Panda	Professor	Ph.D	Power Electronics	29 January 2013	08	02
Dr. Supriyo Das	Assistant Professor	B.Tech, M.Tech, Ph.D	High Voltage Engineering	25th August 2014	0	0
Ms. Ramyani Chakrabarty	Trainee Teacher	B.Tech, M.Tech, Ph.D. (Pursuing)	Power & Control	21st July, 2014	NIL	NIL

## 4. Staff Profile:

Name	Designation	Qualification	Date of Joining	Nature of Job
Mr. Sushanta Nath	Technical Assistant	B.E (NIT Agartala) M.Tech (NIT Meghalaya)	13/08/2012	Regular
Mr. Bankitbok Laloo	Technical Assistant	Diploma in Electrical	16/12/2021	Regular
Mr. Ankur Rai	Technical Assistant	M.Tech (NIT Nagaland)	22/12/2021	Regular
Mr. Felix Albert Nongneng	Technician	M.Tech (IIT Madras)	14/12/2021	Regular
Mr. Rishandonborlang Mawrie	Technician	B.Tech	16/12/2021	Regular
Mr. Nangskhem Khongwir	Technician	B.Tech	20/12/2021	Regular
Ms. Julene Seka H Thabab	Technician	M.Tech	13/12/2021	Regular
Mr. Vicky Staryson Wahlang	Lab Attendant	B.Tech	23/12/2021	Regular
Mr. Melong Bareh	Technician	B.Tech	30/07/2018	Contractual
Ms. Iohhunlang Suting	Technician	B.Tech	28/11/2019	Contractual

## 5. List of Publications:

### A. Journals:

1. S. L. Chukkalluru, A. Kumar, and **Shaik Affijulla**, "Tensor-Based Dynamic Phasor Estimator Suitable for Wide Area Smart Grid Monitoring Applications", *Journal of Control, Automation and Electrical Systems*, Springer, vol. 03, no. 01, pp.01-10, 2022
2. Mukesh Kumar and **Shaik Affijulla**, "On-line estimation of alternators rotor angle dynamics in the modern power system", *International Journal of Electrical Power & Energy Systems*, Elsevier, vol. 134, no. 107314, pp. 01-09, 2022.
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6. Chiranjit Sain, **Atanu Banerjee**, P K Biswas, T Sudhakar Babu, B. Chitti Babu “Sensor Angle based Control Strategy and Dynamic Analysis of a Sinusoidal PWM Operated Permanent Magnet Synchronous Machine Drive for Electric Propulsion Unit”, *International Transactions on Electrical Energy Systems, Wiley*, 31(12),e13090, August, 2021.
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  10. P. R. Bana, K. P. Panda, S. Padmanaban and **G. Panda**, “Extendable Switched-Capacitor Multilevel Inverter With Reduced Number of Components and Self-Balancing Capacitors,” in *IEEE Transactions on Industry Applications*, vol. 57, no. 3, pp. 3154-3163, May-June 2021.
  11. K. P. Panda, P. R. Bana, O. Kiselychnyk, J. Wang and **G. Panda**, “A Single-Source Switched-Capacitor-Based Step-Up Multilevel Inverter With Reduced Components,” in *IEEE Transactions on Industry Applications*, vol. 57, no. 4, pp. 3801-3811, July-Aug. 2021.
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  17. Shadangi, Pushpanjali, Swain, Sushree Diptimayee, Ray, Pravat Kumar and **Panda, Gayadhar**. “Experimental verification of DSTATCOM for various non-linear load” *International Journal of Emerging Electric Power Systems*, vol., no., 2021.
  18. **P. P. Singh**, “A Novel Chaotic System with Wide Spectrum, its Synchronization, Circuit Design and Application to Secure Communication”, *Indian J. Science Technology*, vol. 14, Issue 28, pp. 2351-2367, July 2021.
  19. Anand Kumar and **P. P. Singh**, “Synchronisation of Unified Chaotic Systems Using Modified Nonlinear Active Control: Circuit Design, Implementation, and Secure Communication”, *IETE Journal of Research*, March 2022.
  20. **R. Chakrabarty** and R. Adda, “DSTATCOM implementation using Reduced Switch Single DC Source Cascaded H-bridge Multilevel Inverter”, *Electric Power Systems Research*, Vol. 199, pp. 107373, 2021.
  21. Siddhartha Deb Roy, **Sanjoy Debbarma**, “Imposter Attacks in Energy Market Operation”, *IEEE Transactions on Smart Grid*, April 2022 (Accepted).
  22. Siddhartha Deb Roy, **Sanjoy Debbarma** and Adnan Iqbal, “A Decentralized Intrusion Detection System for Security of Generation Control” *IEEE Internet of Things Journal*, March 2022 (Accepted).
  23. Siddhartha Deb Roy, **Sanjoy Debbarma**, Josep.M. Guerrero, “Machine Learning based Multi Agent System for Detecting and Neutralizing Unseen Cyber-Attacks in AGC and HVDC Systems”, *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, Vol 12, No. 1, pp. 193-182, March 2022.

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25. K S S Balaji Dulipala and **Sanjoy Debbarma**, “Decision-Making Model with Reduced Risk of Penalties in Transactive Energy Markets”, *Electric Power Systems Research (EPSR)*, Elsevier, Vol. 199, Oct. 2021, 107371

## B. Book Chapters:

1. S. K. Prince, **Shaik Affijulla** and G. Panda, “A DWT-RNN-Assisted Intelligent Differential Protection Scheme for Grid-Tied and Islanded DC Microgrid”, *Sustainable Energy and Technological Advancements, Book of Advances in Sustainability Science and Technology, Springer, Singapore*, pp.01-11, Mar 2022
2. Chiranjit Sain, **A Banerjee**, P K Biswas “Control Strategies of a Permanent Magnet Synchronous Motor Drives for Electric Vehicles”-CRC Press, Taylor & Francis, ISBN 9781032038902, accepted for publication, total pages 248, 2021.
3. Puhan, P.S., Dash, S.K., Ray, P.K., **Panda, G.**, Pothauri, M. (2022). Instantaneous Reactive Combined Loss Component Power Theory-Based Hybrid Filter for Power Quality Improvement in Distribution System, *Advances in Sustainability Science and Technology*. Springer, Singapore.
4. Mohammadi, Z., Pinto, S.J., **Panda, G.**, Thokchom, S. (2022). A Survey of Cyber Security in Smart Microgrid, *Advances in Sustainability Science and Technology*. Springer, Singapore.
5. Buduma, P., Das, M.K., Sharma, A.K., **Panda, G.**, Mishra, S. (2022). Automatic Generation Control for Hybrid Power System in Deregulated Environment, *Advances in Sustainability Science and Technology*. Springer, Singapore.
6. Das, S., B Rajanarayan Prusty, Bingi, K., Panda, K.P., **Panda, G.** (2022). Time Series Decomposition Techniques for Renewable Generation Applications, *Advances in Sustainability Science and Technology*. Springer, Singapore.
7. Shadangi, P., Swain, S.D., **Panda, G.** (2022). Space Vector Pulse Width Modulation-Based DSTATCOM for Harmonic Compensation, *Advances in Sustainability Science and Technology*. Springer, Singapore.
8. Das, P., Kumar, S., **Panda, G.**, Roy, D.S. (2022). Data-Driven Event Detection with PMU Data Using a Novel Composite Deep Learning Technique, *Advances in Sustainability Science and Technology*. Springer, Singapore.
9. Vemuri, E. et al. (2022). Power Management and Control in Microgrid System, *Advances in Sustainability Science and Technology*. Springer, Singapore.
10. Lahon, P., Kandali, A.B., **Panda, G.**, Patowary, M. (2022). A Review on Control Methods Used in Renewable Energy Source-Fed Induction Motors, *Advances in Sustainability Science and Technology*. Springer, Singapore.
11. Bingi, K., B Rajanarayan Prusty, Panda, K.P., **Panda, G.** (2022). Time Series Forecasting Model for Chaotic Fractional-Order Rössler System, *Advances in Sustainability Science and Technology*. Springer, Singapore.
12. Kumari, P., Narendra Babu, P., Panda, K.P., Bisoyi, S.K., **Panda, G.** (2022). Power Quality Improvement in Distribution Network Using PV Integrated DSTATCOM, *Advances in Sustainability Science and Technology*. Springer, Singapore.
13. Sahoo, S., **Panda, G.** (2022). Output Power Tracking and Oscillation Control of a Doubly Fed Induction Generator-Based Wind Energy Conversion System Using Adaptive Neuro-Fuzzy Algorithm, *Advances in Sustainability Science and Technology*. Springer, Singapore.
14. Prince, S.K., Affijulla, S., **Panda, G.** (2022). A DWT-RNN-Assisted Intelligent Differential Protection Scheme for Grid-Tied and Islanded DC Microgrid, *Advances in Sustainability Science and Technology*. Springer, Singapore.
15. **P. P. Singh**, B. K. Roy, C. Volos, Memristor based novel 4D chaotic system without equilibria: Analysis and Synchronisation in Book “*Mem-elements for Neuromorphic Circuits with Artificial Intelligence Applications*” C. Volos and V. T. Pham (eds.), Elsevier Academic Press, pp. 183-205, 2021.
16. R. Jaiswal, H. Raj, P. R. Kumar, and **P. P. Singh**, A Variant of Rossler Type-IV Chaotic System with a Line of Equilibria and Coexisting Attractors in Book “*Sustainable Energy and Technological Advancements*” G. Panda et al. (eds.), Springer Nature Singapore Pte. Ltd., pp. 825-836, March 2022.

### C. Conferences:

- S. K. Prince, D. Kumar, S. Affijulla and **G. Panda**, "Electric Faults Detection Technique for DC Microgrids," *2022 IEEE International Conference on Power Electronics, Smart Grid, and Renewable Energy (PESGRE)*, 2022, pp. 1-6.
- P. Buduma, M. K. Das, R. T. Naayagi, S. Mishra and **G. Panda**, "Seamless Operation of Master-Slave Organized AC Microgrid with Robust Control and Islanding Detection," *3 2020rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. S. Dash, T. Pradhan, S. Bastia, **G. Panda**, A. Mohanty and P. K. Ray, "Power quality improvement in isolated microgrid using interleaved soft-switching boost converter with modulated three phase voltage source inverter," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-5.
- N. B. P, R. Thakur, S. K. Bisoyi, R. Peesapati and **G. Panda**, "Intermixed Generalized Integrator based Grid-Friendly Inverter Control for Power Quality Enrichment in Microgrid System Applications," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- P. Garanayak, K. P. Panda, R. T. Naayagi and **G. Panda**, "An Ultra-Fast Master-Slave ADALINE for Hybrid Active Power Filter including Photovoltaic System," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. K. Jalan, B. C. Babu, S. K and **G. Panda**, "A Novel Phase Locked Loop based Control Strategy for a Three-phase Grid-tied Solar PV System," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. S. Rath, **G. Panda**, P. K. Ray and A. Mohanty, "A Comprehensive Review on Microgrid Protection: Issues and Challenges," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. R. Paital, P. K. Ray, A. Mohanty and **G. Panda**, "Neuro-Fuzzy Sliding Mode Control based Wide Area Power System Stabilizer For Transient Stability Improvement," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- P. Buduma, M. K. Das, S. Mishra and **G. Panda**, "Robust Power Management and Control for Hybrid AC-DC Microgrid," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. K. Prince, S. Affijulla and **G. Panda**, "Total Harmonic Distortion based Fault Detection in Islanded DC Microgrid," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- B. Maddila, N. B. P and **G. Panda**, "Frequency Stability Enhancement of Thermal Power Plant-Integrated Microgrid with Virtual Inertia Emulation," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- K. P. Panda, N. B. P, S. K. Bisoyi and **G. Panda**, "Reduced Switch Quadruple Boost Switched-Capacitor based Multilevel Inverter," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- P. Dash, Y. U. Rani, **G. Panda** and A. Saha, "Stability Analysis Of A Grid Connected Microgrid Under Numerous Fault Conditions Based On Centralized Digital-Controlled HESS," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- C. Chandraratne, R. T. Naayagi and **G. Panda**, "Development and Implementation of an Adaptive Overcurrent Protection Algorithm for a Modern Power Distribution Network," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- S. R. Das, P. K. Ray, A. Mohanty and **G. Panda**, "Power Quality Enhancement in PV and Battery Storage Based Microgrid Using Hybrid Active Filter," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-5.
- S. K. Prince, **S. Affijulla** and G. Panda, "Fault Detection in IEEE 9-Bus DC Microgrid System using Differential Current Method," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6.
- Prakash Chandra Gupta, and **Piyush Pratap Singh**, "Multistability, multiscroll chaotic attractors and angle instability in multi-machine swing dynamics," *7th International Conference on Advances in Control and Optimization of Dynamical Systems (ACODS)*, Vol. 7, NIT Silchar, 22-25 Feb. 2022.

- R. Roy** et al., "MMCC Based Decoupled Control of PMSG for Small Scale Hydro Power Plants," *IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society*, 2021, pp. 1-6, doi: 10.1109/IECON48115.2021.9589944.
- R. Gandhi, E. Sankararao, R. Wilson, A. Kumar and **R. Roy**, "Analysis of Flux Density in PMSM with Constant Mutual Flux Linkage Control Strategy Using FEM Model," *2020 3rd International Conference on Energy, Power and Environment: Towards Clean Energy Technologies*, 2021, pp. 1-6, doi: 10.1109/ICEPE50861.2021.9404410.

### 6. Conference / Workshop / Seminar Organized:

- Organized *Five Days AICTE Sponsored Online Short-Term Training Programme on "Smart Grids & Power System"*, March 21st– 25th 2022 (Coordinator: Dr. S. Debbarma)
- Organized FDP on *"Emerging Applications of Advanced Power Electronic Converters"*, 20-24 Sept., 2021, NIT Meghalaya (coordinator: Dr. A. Banerjee)
- Organized 1<sup>st</sup> *International Symposium on Sustainable Energy and Technological Advancements (ISSETA 2021)*, Publisher - Springer, NIT Meghalaya, 24-25 Sept., 2021. (Organizing Chair: Dr. S. Affijulla)

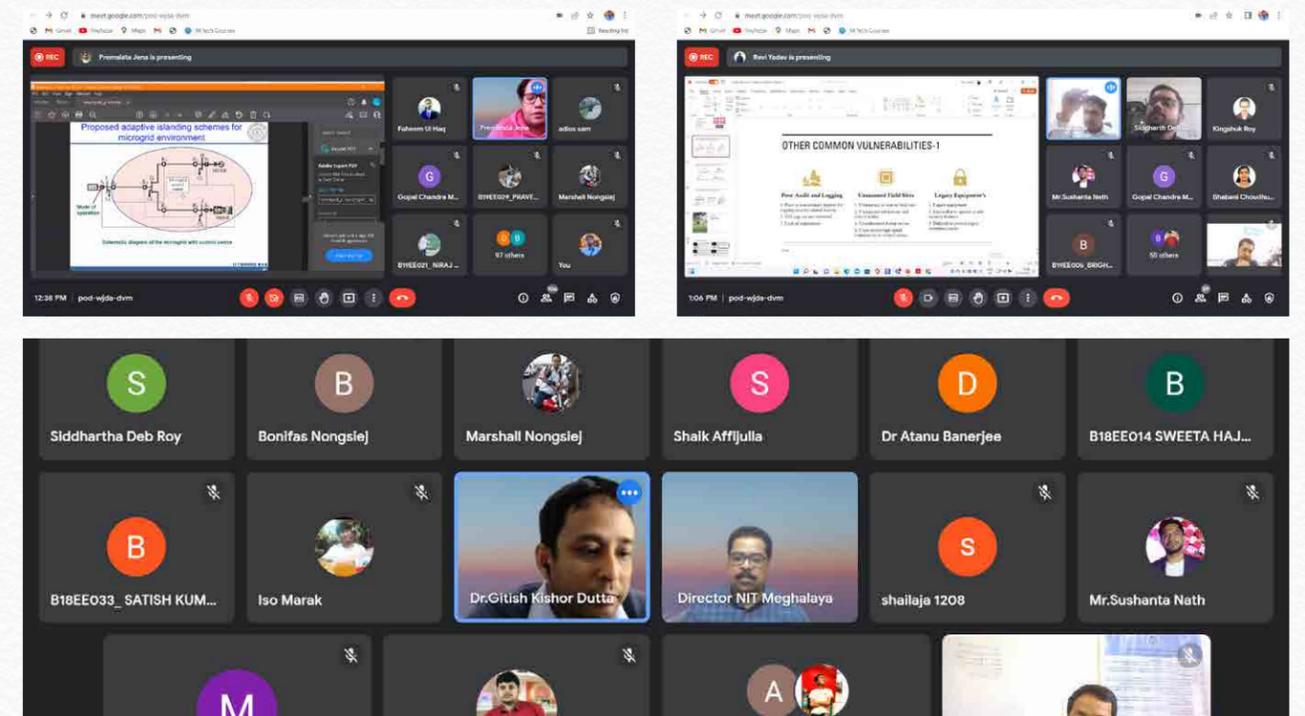


Fig 1: Five Days AICTE Sponsored Online Short-Term Training Programme on "Smart Grids & Power System during March 21st– 25th 2022 (Coordinator: Dr. S. Debbarma).

## 7. Conferences / Workshops / Seminars / Training Attended by Faculty Members:

Sl. No.	Name of Faculty	Name of the Programme Attended	Duration
1	Dr. P. P. Singh	1. The 7th International Conference on Advances in Control & Optimization of Dy-namical Systems (ACODS), NIT Silchar	February 22-25, 2022.
2	Dr. R. Roy	1. 47th Annual Conference of the IEEE Industri-al Electronics Society	Oct 13-16, 2021

## 8. Invited Talks Delivered:

### I. Prof. Gayadhar Panda:

- Expert Lecture on the topic "Power Quality Issues in Microgrid Scenario and control" on 25th May 2021, NITTTTR Chandigarh.
- Expert Lecture on the topic "Seamless Operation of Micro-Grid System (Power Management and Control)" on 27th May 2021, NITTTTR Chandigarh.
- Expert Lecture on the topic "Seamless Transition of Micro grid System- Issues and Challenges" held on 10th June 2021, NITTTTR Chandigarh.
- Expert Lecture on the topic "Smart Microgrid Operation with RES and EV" on 08-04-2022, NITTTTR Chandigarh.
- Invited Talk on "Transactive Energy Framework Involving Community Microgrids", AICTE-ISTE Induction/Refresher Programme on Electric Vehicle and Smart Grid: A Path Towards Sustainable Energy, KIIT University, Bhubaneswar, 17-23 Dec. 2021.
- Invited Talk on "Transactive Energy Framework Involving Community Microgrids", AICTE ATAL FDP on Design and Optimization of EV Charging Technology in Smart Grid Platform (DOETSGP-2021), Puducherry Technological University, 17-13 Sept. 2021.
- Invited Talk on "Smart Grid: Transformation of Electric Utility" Five days FDP on Industrial automation-Emerging Technologies, 8th June 2021, Amity University, Noida.

### II. Dr. Ksh Milan Singh:

- Delivered an invited talk on "Signal Processing for Cognitive Neuroscience Applications" in Faculty Development Programme organized by NIT Meghalaya in association with AICTE Training and Learning (ATAL).

### III. Dr. S. Debbarma:

- Delivered Expert Lecture on "Transactive Energy Framework Involving Community Microgrids" AICTE Sponsored Five Days STTP on "Smart Grids & Power System" (SGPS 2022) during March 21-25, 2022, at NIT Meghalaya.

### IV. Dr. P.P. Singh:

- Online expert lecture on "Control systems analysis in state-space framework" at MVJ College of Engineering, Bangalore, dated 24th July 2021.
- Expert Lecture Delivered: AICTE Sponsored Five Days STTP on "Smart Grids & Power System" (SGPS 2022) during March 21-25, 2022, at NIT Meghalaya. (Topic: Multistability, Multiscroll Chaotic Behaviours in Multi-machine Swing Dynamics and Control)

## 9. Awards Won/ Recognition received at the National and International level:

- Dr. P. P. Singh is elevated to the grade of IEEE Senior member on 03rd July 2021.
- Dr. K.M. Singh is elevated to the grade of IEEE Senior member on 03rd July 2021.

## 10. Patents

1.	Dr. Atanu Banerjee	Haricharan Nannam, Atanu Banerjee, Pratikanta Mishra-"Impedance Network based Enhanced Voltage Cascaded H-bridge Converter" Published in Journal of Intellectual Property India (Journal No-03/2020), Department of Industrial Policy & Promotions, Government of India, January 2020, page no: 3117 & Patent (Application No: 202031000006 dated 01.01.2020) is granted on November 2021, patent no. 381849.
2.	Dr. Rakesh Roy	An electric carrier for transportation, publication date – 10/12/2021.

## 11. Administrative Responsibilities Held at NIT Meghalaya:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr. S. Debbarma	HOD, EE Dept.	1 July 2020- Till date
		Member, Construction & Development of NIT Meghalaya Permanent Campus	28, Feb 2020 – till date.
		Member, Academic Program Committee (APC)	31/8/2020 - Till date
		Chairman, Departmental Research Committee (DRC), EE Department	1st July 2020 - Till date
2	Dr. P. P. Singh	PIC, Security Committee	2019 – Till date
		Member, Institute Cultural Committee	2018 - Till date
3	Dr. Rakesh Roy	UGPIC	01/07/2021- Till date
4	Dr. Atanu Banerjee	Chief Vigilance Officer Chairman, Internal Quality Assurance Committee	
6.	Prof. Gayadhar Panda	Dean (Academic Affairs)	From 11/10/2018 - Till date
7	Dr. S. Affijulla	Chairman, Routine Committee	1st July 2021 – Till date
		Convener, IQAC	1st July 2021 – Till date
8	Dr. Ksh. Milan Singh	Vice President, Games & Sports SAC	1st July 2021- Till date
		Member in PEC, NIT Meghalaya	July 2021 - Till date
		Member in Robotic, NIT Meghalaya	July 2021 - Till date

## 12. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Membership
1.	Dr. S. Debbarma	Senior Member IEEE, IEEE PES Society, IEI (India)
2.	Dr. P. P. Singh	Senior Member IEEE, IEEE Control System Society, IEI (India), Automatic Control & Dynamic Optimization Society (ACDOS), Member
3.	Dr. Rakesh Roy	IEEE, IEI
4.	Dr. Shaik Affijulla	Senior Member IEEE, IEI
5.	Dr. Atanu Banerjee	IEEE, IEI

Sl. No.	Name of Faculty	Membership
6	Dr. Ksh Milan Singh	Senior Member IEEE, IEI
7	Prof. Gayadhar Panda	Senior Member IEEE, Fellow IE (I), Life Member ISTE
8	Dr. Supriyo Das	Senior Member IEEE, IEEE DEIS society & IEEE PES so-ciety
9	Mrs. Ramyani Chakrabarty	IEEE Students Member

### 13. Any Other Information on Professional Activities:

#### I. Prof. G. Panda

- Associate Editor in *International Transactions on Electrical and Energy Systems (ITEES)*, Wiley, from Feb-2021 to till date.
- Editorial Board Member in *International Journal of Emerging Electric Power Systems, De Gruyter* from Feb-2021 to till date.
- Associate Editor in *International Journal of Renewable Energy Technology*, Inderscience Publishers Ltd from July 2020 to till date.

#### II. Dr. Ksh Milan Singh

- Session Chair** in Electric Power and Renewable Energy Conference (EPREC), Department of Electrical Engineering, NIT Jamshedpur, India during, **28<sup>th</sup> -30<sup>th</sup> May 2021**
- Technical Program Committee Member** in Electric Power and Renewable Energy Conference (EPREC), Department of Electrical Engineering, NIT Jamshedpur, India during, **28<sup>th</sup> -30<sup>th</sup>, May 2021**
- Organized an Expert Lecture under CIIE, NIT Meghalaya on 18<sup>th</sup> Sep 2021 (**Coordinator**)
- Organized an Expert Lecture under CIIE, NIT Meghalaya on 8<sup>th</sup> Sep 2021 (**Coordinator**)
- Organized an Expert Lecture under CIIE, NIT Meghalaya on 5<sup>th</sup> November 2021 (**Coordinator**)

- Organized an Expert Lecture under CIIE, NIT Meghalaya on 6<sup>th</sup> September 2021 (**Coordinator**)
- Organized International Yoga Day at NIT Meghalaya on 21<sup>st</sup> June 2021 (**Coordinator**)

#### III. Dr. S. Debbarma

- Member, Execute Committee, *IEEE Guwahati Subsection*.
- Expert Member, Visiting Team, *Opening Permission of Shillong Govt. College of Engineering*, Mawlai (24 Nov 2021).
- Advisor, *Faculty Recruitment at GIET University*, Gunupur, Odisha, July 2021.
- Member, *Area Advisory Board (AAB)*, Amity Institute of Technology, Amity University, July 2021- Till date.
- External Expert*, M.Tech Evaluator, KIIT Bhubaneswar, Odisha (May 2021).

#### IV. Dr. Rakesh Roy

- The invention of electric carrier is published in the Times of India (Kolkata Edition) on 3<sup>rd</sup> April 2022.

#### V. Mrs. Ramyani Chakrabarty

- Ph.D. Thesis submitted at IIT Guwahati under the supervision of Dr. Ravindranath Adda.

# Department of Electronics and Communication Engineering

## 1. Brief Introduction to the Department:

The Department of Electronics and Communication Engineering (ECE) was established in 2010 with the inception of National Institute of Technology Meghalaya. The department offers B. Tech Programme with an intake capacity of thirty & M.Tech Programme with an intake capacity of twenty in VLSI and Embedded Systems and Ph.D. program in various specialized areas of Electronics and Communication Engineering. The major objective of the Department is to impart high-quality technical education and research with a strong foundation in Electronics and Communication Engineering.

The major research groups of the department are Microelectronics, Microwave and Communication Signal

and Image processing. The major areas of faculty expertise of the department include High Speed and Low Power VLSI Systems, VLSI Architectures, Computer Arithmetic, Microelectronics Device and MEMS, High-Performance Computing, Communication and RF & Microwave Engineering, Antenna design, Signal and Speech Processing, Biomedical Signal Processing and Machine learning.

## 2. Programmes Offered:

- B. Tech in Electronics and Communication Engineering
- M.Tech in VLSI and Embedded Systems (Full Time & Part Time)
- Ph. D (Full Time & Part Time)

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remark
Dr. Anup Dandapat	Associate Professor	Ph.D	Low Power VLSI, Low Power Digital Circuits, Low Power High Speed Multipliers, Low Power High Speed Memories	20.12.2012	Pursuing –1 Awarded – 8	Regular -8
Dr. Ch V Rama Rao	Assistant Professor	Ph.D	Speech Technology, Pattern Recognition, Statistical Signal processing, Signal processing issues in Advanced Communication	28.08.2014	Pursuing – 4 Awarded –2	Part time – 2 Regular - 2 Project - 1
Dr. Prabir Kumar Saha	Assistant Professor	Ph.D	VLSI Design, Computer Arithmetic, Digital Signal Processing, Reconfigurable Computing	13.06.2012	Pursuing –3 Awarded –1 Submitted-1	Regular -1 Part time –1 Co supervisor- 1
Dr. P Rangababu	Assistant Professor	Ph.D	FPGA-based Embedded Systems for Multimedia and DSP Applications, VLSI Chip Design, Reconfigurable Systems for Medical Diagnosis	11.08.2014	Pursuing –4 Awarded - 2	Regular – 1 Part time - 3

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remark
Dr. Pradeep Kumar Rathore	Assistant Professor	Ph.D	Micro-Electro-Mechanical Systems (MEMS), Microelectronics, Device Fabrication Technology	11.08.2014	Pursuing – 0 Awarded– 1	
Dr. Bishnulatpam Pushpa Devi	Assistant Professor	Ph.D	Image processing, Hyperspectral Image Analysis, Digital Watermarking	03.01.2013	Pursuing –2	Regular - 2
Dr. Abhishek Sarkhel	Assistant Professor	Ph.D	Microwave metamaterials and its applications, Microwave antennas	23.08.2013	Pursuing – 4	Regular -2 Part time –1 Co supervisor- 1
Dr. Shubhankar Majumdar	Assistant Professor	Ph.D	RF, High Speed and Power Semiconductor Devices, VLSI circuit design and Modeling Low cost Energy efficient system for Agriculture & Health Sector	13.12.2017	Pursuing –6	Regular -1 Part time - 1 Project - 4
Dr. Salam Shuleenda Devi	Assistant Professor	Ph.D	Medical Image Analysis, Cancerous cell analysis, Pattern recognition, machine learning	24.09.2019	Pursuing –2	Part time – 1 Regular - 1
Dr. Satyendra Singh Yadav	Assistant Professor	Ph.D	Wireless Communication (5G and Beyond), Parallel Computing, Machine Learning	24.10.2019	Pursuing –1	
Dr. Shravan Kumar Bandari	Assistant Professor	Ph.D	Beyond 5G communications, multi-carrier waveforms for next-generation wireless systems, cognitive radio and machine learning algorithms	30.09.2019	Pursuing –2	Full-time-1, Part time-1
Prof. Israel Cohen	Adjunct Professor	Ph.D	Statistical signal processing, analysis and modeling of acoustic signals, speech enhancement, noise estimation, microphone arrays, source localization, blind source separation, system identification and adaptive filtering.	06-10-21		
Prof. N C Shivaprakash	Adjunct Professor	Ph.D	Electronic Instrumentation, Analytical Instrumentation, Embedded systems and Development of a high pressure DTA and its applications	01-04-22		
Prof. Ganapati Panda	Adjunct Professor	Ph.D	Electronics and Communication Engineering (Digital Signal Processing/ Distributed Signal Processing/Digital Communication /Sensor Networks/ Intelligent Instrumentation/Soft Computing/Evolutionary Computing/ Computational Finance)			

## 4. List of Publications:

### A. Journals:

- Swamy Baldev, Pradeep Kumar Rathore, Rangababu Peesapati, Kiran Kumar Anumandla, A directional and scalable streaming deblocking filter hardware architecture for HEVC decoder, Microprocessors and Microsystems, 2021,104029, ISSN 0141-9331
- Venkata Reddy Kopparthi, Anil Kali, Samrat L. Sabat, Kiran Kumar Anumandla, Rangababu Peesapati, J.S. Armand Eyebe Fouda, Hardware architecture of a digital piecewise linear chaotic map with perturbation for pseudorandom number generation, AEU - International Journal of Electronics and Communications, Volume 147, 2022, 154138, ISSN 1434-8411,3.183
- S. Gogoi and R. Peesapati, "Design and Implementation of Gray-Coded Bit-Plane based Reconfigurable Motion Estimation Architecture Using Binary Content Addressable Memory for Video Encoder," in IEEE Transactions on Consumer Electronics, doi: 10.1109/TCE.2021.313994
- S. Gogoi and R. Peesapati, "Design and Implementation of an Efficient Multi-Pattern Motion Estimation Search Algorithm for HEVC/H.265," in IEEE Transactions on Consumer Electronics, doi: 10.1109/TCE.2021.3126670. 2.97
- Gogoi, S., Peesapati, R. A hybrid hardware oriented motion estimation algorithm for HEVC/H.265. J Real-Time Image Proc (2021). [https://doi.org/10.1007/s11554-020-01056-w\(2\) 2.358](https://doi.org/10.1007/s11554-020-01056-w(2) 2.358)
- Varma, K. Thulasiram Peesapati, Rangababu Rao, Ch. V. Rama Rajarajan, A. K. Dixit, Makara Joshi, Gopal A Novel SSA-NLLSF Approach for Denoising NQR Signals Appl Magn Reson Springer 2021 <https://doi.org/10.1007/s00723-021-01415-1 0.831>
- M. S. Singh, J. Ghosh, S. Ghosh and A. Sarkhel, "Miniaturized Dual-Antenna System for Implantable Biotelemetry Application," IEEE Antennas and Wireless Propagation Letters, vol. 20, no. 8, pp. 1394-1398, Aug. 2021.
- S. Ghosh, S. Roy, U. Chakraborty, A. Sarkhel, An ELC Meta-resonator Inspired Wideband Wearable MIMO Antenna System for Bio-telemetry Applications, Taylor Francis: Journal of Electromagnetic Waves and Applications
- Sandeep Das, Subhrajit Dutta, Dibyendu Adak, Shubhankar Majumdar, "On the crack characterization of reinforced concrete structures: Experimental and data-driven numerical study" Structures (Elsevier), vol. 30, April 2021, Pages 134-145.
- Srikant Kumar Beura, ReKib Uddin Ahmed, Bishnulatpam Pushpa Devi, and Prabir Saha, "On The Implementation of Densely Packed Decimal Number System Based Adder: Prospects and Challenges", Electronics, Vol-25, Pages 20-30, June 2021
- S. Roy, A. Kumar Biswas, S. Ghosh, U. Chakraborty, A. Sarkhel, Isolation Improvement of Dual/Quad-element Textile MIMO Antenna for 5G Application, Taylor Francis: Journal of Electromagnetic Waves and Applications, Vol.-35, Issue No.-10, Page Nos -1337-1353, 2021.
- S.D. Thabab, and P. Saha, "Minimizing Ancilla Inputs and Garbage Outputs of Reversible BCD Multiplier", Journal of Circuits, Systems and Computers, Accepted, Aug. 2021.
- P. Saha, and P. Smanta, "Investigations on Decimal Multipliers Through Novel Partial Product Generators", J. Inst. Eng. India Ser. B, Accepted, July 2021.
- S. K. Beura, R. U. Ahmed, B. P. Devi, and P. Saha, "On The Implementation of Densely Packed Decimal Number System based Adder: Prospects and Challenges" Electronics Journal, vol. 25, no.1, pp. 20-30. June 2021.
- S.D. Thabab, and P. Saha, "Reducing Quantum Cost for the Reversible Realization of Densely-Packed-Decimal Converters" IJE TRANSACTIONS B: Applications vol. 34, no. 05, pp. 184-191, May 2021.
- S.D. Thabab, and P. Saha, "Improved Signed Binary Multiplier Through New Partial Product Generation Scheme" Journal of Circuits, Systems and Computers, vol. 29, no. 16, 2150162-1-21, 2021.
- Naresh Kattakola, Amol Jawale, Pallab Kumar Nath, Shubhankar Majumdar, "Efficient partial product reduction for image processing application using approximate 4:2 compressor," Circuit World (Emerald Publishers), Published Online (Impact Factor- 1.395)
- Hemant Ghayvat, Muhammad Awais, Prosanta Gope, Sharnil Pandya, Shubhankar Majumdar, "ReCognizing SUSpect and PredictiNg ThE SpRead of Contagion Based on Mobile Phone LoCation DaTa (COUNTERACT): A System of identifying COVID-19 infectious and hazardous sites, detecting disease outbreaks based on the internet

of things, edge computing, and artificial intelligence” Sustainable Cities and Society (Elsevier Impact Factor- 5.268) Available online 24 February 2021, vol. 102798 - In Press.

19. Mohd Nadzir, et.al “Risk Assessment and Air Quality Study during Different Phases of COVID-19 Lockdown in an Urban Area of Klang Valley, Malaysia” Sustainability 13 (MDPI Publisher), no. 21: 12217. <https://doi.org/10.3390/su132112217>
20. Anirban Dutta, G. Ashishkumar, Ch. V. Rama Rao, “Improving the Performance of ASR System by Building Acoustic Models using Spectro-Temporal and Phase-Based Features,” Circuits, Systems, and Signal Processing, <https://doi.org/10.1007/s00034-021-01848-w,2022>.

## B. Conferences:

1. S. K. Bandari, and Ch. V. Rama Rao, “ Enhanced Sparse Vector Coding With Limited Pilot Overhead for Short Packet Transmission”, IEEE Advanced Communication Technologies and Signal Processing (ACTS-2021), 15-17 December 2021 DOI: 10.1109/ACTS53447.2021.9708246 .
2. Astha Awasthi, Mithun Kumar, S. K. Bandari, and V.V. Mani, “Maximal ratio sparse vector coding for short packet transmission”, IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS-2021), 13-16 December 2021
3. G. Bhargav and S. Majumdar, “Highly Linearized GaN HEMT Based Class E/F3 Power Amplifier”, IEEE Devices for Integrated Circuit (DevIC) 2021, 19-20 May 2021
4. Srikant Kumar Beura, Gudmalwar Ashishkumar Prabhakar, Sudesna Manjari Mahanta, Bishnulatpam Pushpa Devi, Prabir Saha, “Design and Analysis of Inexact 3:2 Compressor-based Radix-4 Multiplier towards Image Multiplication”, 12th International Conference on Computing, Communication and Networking Technologies (ICCCNT-2021), 6th July to 8th July 2021
5. M. Roy, A. Das, R. Biswas, B. Neogi, and P. Saha, “Mathematical Modeling of Respiratory System Introducing Electrical Control Function Analogy”, ICCDC, Accepted 2021.
6. A. Kalita, R. Peesapati and S. R. Ahamed, “Detection of COVID-19 using a Deep Neural Network with Transfer Learning Approach,” 2022 International Conference on Smart Technologies and Systems for Next Generation Computing (ICSTSN), 2022, pp. 1-5, doi: 10.1109/ICSTSN53084.2022.9761292.

7. Venkata Siva Kumar Kokkiligadda, Venkata Reddy Kopparthi Samrat Sabat Thulasiram Varma Rangababu Peesapati System on Chip Implementation of Floating Point Matrix Inversion Using Modified Gram-Schmidt Based QR Decomposition on PYNQ FPGA ISES-2021 Accepted
8. K. Naresh, P. Sai, S. Majumdar, Design of 8-bit Dadda Multiplier using Gate Level Approximate 4:2 Compressor. Accepted in VLSID 2022.
9. G. Bhargav and S. Majumdar, “Design of Novel Rat-Race Coupler Based Analog Pre-Distortion Circuit for 5G Applications” presented in International Conference for Advancement in Technology (ICONAT) during 21st - 22nd January 2022.
10. Amandeep Sinha, S. Hemanth Kumar, Gudmalwar Ashishkumar Prabhakar, and Ch V Rama Rao, “Extraction of Temporal Features on Fibonacci Space for Audio based Vehicle Classification”, presented in 4th International Conference on Recent Trends in Image Processing & Pattern Recognition (RTIP2R) during December 8-10, 2021.
11. Rantu Buragohain, R Aditya Reddy, Yenduri Venkatesh, Gudmalwar Ashishkumar Prabhakar, and Ch V Rama Rao, “Single Channel Speech Enhancement using Masking based on Sinusoidal Modeling”, presented in 4th International Conference on Recent Trends in Image Processing & Pattern Recognition (RTIP2R) during December 8-10, 2021.

## C. Book Chapters:

1. K. Naresh and S. Majumdar (2021) Applications of the Approximate Computing on ML Architecture In book “VLSI and Hardware Implementations using Modern Machine Learning Methods (CRC Press).
2. Narendra Babu P, Kaibalya Prasad Panda, Chittibabu B, Rangababu P, Gayadhar Panda, Chapter 12 - A novel adaptive fuzzy-based controller design using field programmable gate arrays for grid-connected photovoltaic systems, Editor(s): Anuradha Tomar, Ritu Kandari, Advances in Smart Grid Power System, Academic Press, 2021, Pages 331-364, ISBN 9780128243374

## 5. Patent:

1. S. Majumdar, S. Akashe, A. Chaudhary, A. Verma, “Automatic refilling soil tensiometer and tip rinsing mechanism through fluid whirls”, Indian Patent. Application no. 201931005912.
2. Hydropod: Low-cost, Scalable, and Cloud-assisted Hydroponics system, by D. Adak, P. Singh, S. Majumdar. Australian Innovation Patent. Application no. 2021102647.
3. Artificial intelligence and big data analytics-based insurance service fraud detection system. Indian patent. Application No. 202141008884.
4. A Method for Automatic Detection of Infected Erythrocytes by S. Shuleenda Devi, R. H. Laskar, Manish Sharma. Australian Innovation Patent. Application no. 2021103689.

## 6. Externally Sponsored R&D Project[s] as PI/Co-PI:

Sl. No.	Name of the faculty member	Title of the Project	Period (From -To)	Sponsoring Organisation	Amount [in Lakhs]	Role [PI/Co-PI]
1	Dr. Anup Dandapat	Assessment of cli-mate change impacts on soils and various water basins of Meghalaya using existing and newer techniques	Mar 2019 - Mar 2022	DST	66.45	Co-PI
2	Dr Ch V Rama Rao	Phonetic and pro-sodic analysis of Khasi language	10 Aug 2018 - 09 Aug 2021	SERB, DST	16.13	PI
3	Dr Ch V Rama Rao	Masking of interfer-ing sounds in a crowded environ-ment for hearing aid applications	02 Mar, 2019 - 01 Mar, 2022	SERB, DST	23.46	PI
4	Dr Ch V Rama Rao	Post-processing of NQR signals in digital domain in FPGA	13 July, 2018 - 30 June, 2021	BRNS, DAE	20.03	Co-PI
5	Dr.P. Rangababu	“Design and devel-opment of low power processor for IoT based machine learning applications	20 Nov 2019-28 Feb 2022	TEQIP-III	2.1	PI
6	Dr.P. Rangababu	Post-processing of NQR signals in digital domain in FPGA	13 July, 2018 - 30 June, 2021	BRNS, DAE	20.03	PI
7	Dr.P. Rangababu	A Deep Learning Approach for Preservation of Cul-tural Heritage	28 Jan 2022-Jan 2025	SERB CRG	23.91	Co-PI
8	Dr.P. Rangababu	A “Real-Time Con-trol and Energy Management for Seamless Operation of DC Microgrid in Grid-connected and Standalone Modes	01Aug 2018- 31 July 2021	SERB	44.56	Co-PI
9	Dr.P. Rangababu	Development of High Sensitivity CMOS-MEMS Inte-grated Smart Pressure Sensor and System for Space Applications	2019 - 2022 Continuing	ISRO	32.46	Co-PI
10	Dr.P. Rangababu	Design and Devel-opment of Highly Sensitive Non-Conventional Ring Channel Shaped MOSFET Based Current Mirror Inte-grated Pressure Sen-sors	19 July 2021- 19 July 2024	Department of Science & Technology, Ministry of Science and Technology, Government of India	44.93	Co-PI

Sl. No.	Name of the faculty member	Title of the Project	Period (From -To)	Sponsoring Organisation	Amount [in Lakhs]	Role [PI/Co-PI]
11	Dr. Shubhankar Majumdar	Air quality network for smart city: real-time air quality monitor, evaluation, and prediction of air pollutants using machine learning through the deployment of low-cost air quality sensor (LAQS) in India and two selected asean countries (Malaysia, Philippines)	Aug 2021-Jul 2023	ASEAN-India STI Cooperation	26.25	PI
12	Dr. Shubhankar Majumdar	Tensionmeter based automated IoT system for Irrigation	May 2019-Apr 2021	DST (Device Development Program)	16.85	PI
13	Dr. Shubhankar Majumdar	Prediction, Detection and Monitoring System for Land-slide in Hilly Region	June 2019-May 2021	Indo-Japan Project Department of Science & Technology (International Bilateral Co-operation Division)	6.26 + 36,000 \$ (Japanese Side)	PI
14	Dr. Shubhankar Majumdar	Development of E-mode III-Nitride devices for Energy Optimized Agile Power Electronics Indo-Czech Project with Alice Hospodkov	2020-2023	Department of Science & Technology (International Bilateral Co-operation Division)	27.76+26.75 (CEERI PILLANI)+euro 3,00,000 (czech side)	PI
15	Dr. Pradeep Kumar Rathore	Development of High Sensitivity CMOS-MEMS Integrated Pressure Sensor and System for Space Application		Indian Space Research Organisation (ISRO), Department of Space, Government of India	32.46	PI
16	Dr. Pradeep Kumar Rathore	Design and Development of Highly Sensitive Non-Conventional Ring Channel Shaped MOSFET Based Current Mirror Integrated Pressure Sensors		Department of Science & Technology, Ministry of Science and Technology, Government of India	44.93	PI
17	Dr. Pradeep Kumar Rathore	Capacitive Micro-machined Ultrasonic Transducer (CMUT) for Medical Imaging and Under Water Communication		SERB, Department of Science & Technology, Ministry of Science and Technology, Government of India	36.33	Co-PI
18	Dr. B. Shravan Kumar	Deep-cancellation: A deep learning approach to mitigate interference in GFDM receiver for future wireless systems	2021-2023	TEQIP-III	1.83	PI

Sl. No.	Name of the faculty member	Title of the Project	Period (From -To)	Sponsoring Organisation	Amount [in Lakhs]	Role [PI/Co-PI]
19	Dr. P. Rangababu Dr. Ch. V Rama Rao Dr. Abhishek Sarkhel Dr. B. Shravan Kumar Dr. Shubhankar Majumdar Dr. Satyendra Singh Yadav Dr. B. Pushpa Devi Dr. Pradeep Kumar Rathore Dr. Prabir Saha Dr. Anup Dandapat Dr. Salam Shuleenda Devi	AI Empowered Advanced Wireless Communication Systems	Sanctioned on March 5th, 2021, 2021-2026	DST -FIST 2020	80.00 Lakhs	

## 7. Conference / Workshop / Seminar Organized:

- Dr. Pradeep Kumar Rathore organized a Five Day Online Faculty Development Program (FDP) on MEMS Technology Micro-sensors sponsored by AICTE Training and Learning (ATAL) Academy from 26 to 30 July 2021 at NIT Meghalaya, Shillong.
- Dr. P. Rangababu organized a 2-weeks "Online Summer Internship on FPGA based Embedded systems for DSP Applications" in collaboration with NIELIT Calicut from 10th May 2021- 21st May 2021
- Anup Dandapat and Dr.P. Rangababu organized "Recent Trends in VLSI Design" 27th Sep 2021 -1st Oct 2021 at NIT Meghalaya, Shillong.
- Dr.P. Rangababu organized Emerging Trends in Smart Grid and Sustainable Energy Technology, 03-09-21 to 12-09-21 at NIT Meghalaya, Shillong.
- Dr.P. Rangababu organized Custom IC Design from Simulation and verification to Tape-out funded by SMDP 16-09-21 to 20-09-21 at NIT Meghalaya, Shillong.
- Dr. Bishnulata Pushpa, Dr Ch V. Rama Rao, Dr Shravan Kumar Bandari, Dr Salam Shuleenda Devi has jointly organized Five Days National Workshop on "Application of Machine Learning for Communication and Signal Processing", 22nd – 26th Nov 2021
- Dr. Ch. V. Rama Rao organized a Five Day Online Faculty Development Program (FDP) on "Signal Processing for Cognitive Science Applications" sponsored by AICTE Training and Learning (ATAL) Academy from 02 to 06 November 2021 at NIT Meghalaya, Shillong.
- Dr. Ch. V. Rama Rao organized a Five Day Online Faculty Development Program (FDP) on "Signal Processing for Cognitive Science Applications" sponsored by AICTE Training and Learning (ATAL) Academy from 17 to 21 January 2022 at NIT Meghalaya, Shillong.

## 8. Conferences / Workshops / Seminars / Trainings Attended by Faculty Members:

Sl. No.	Name of Faculty	Name of the Programme attended	Duration
1	Dr. Pradeep Kumar Rathore	1. Five day Short Term Training Program on "Sensors and Transducers (ICT086)" 2. Five day Short Term Training Program on "Digital Electronics using VHDL (ICT088)" 3. Three day Workshop on "HDL based VLSI System Design using ModelSim" 4. Three day Workshop on "Schematic based VLSI System Design using LTSPice" 5. Three day Workshop on "Linear Integrat-ed Circuit design using TINA TI"	21/06/2021 to 25/06/2021 28/06/2021 to 02/07/2021 17 -19 June 2021 24 -26 June 2021 8 -10 July 2021
2	Dr. Bishnulatpam Pushpa Devi	International research workshop on advanc-es in deep learning and application	22-26 February, 2022
3	Dr. Abhishek Sarkhel	2nd International Workshop on Metamaterial and its Applications	13-16 December 2021
4	Dr. Shraavan Ku-mar Bandari	1. Virtual event organized by NextG Chan-nel Model Alliance, in collaboration with the IEEE VT-S Propagation Committee and IEEE SA P2982 on "Terahertz Channels And Systems." 2. Participated in the 12th edition of JTG/IEEE Information Theory Society	27th April, 2021 28 June - 1 July 2021.

## 9. Invited Talks Delivered:

- Dr. Abhishek Sarkhel delivered a talk at Vignan's Institute Of Information Technology, Visakhapatnam during 21st July-31st July, 2021 on "Electromagnetic Metamaterials and Its Application in the Microwave Frequency Region".
- Dr. Salam Shuleenda Devi delivered a talk at SRM Institute of Science & Technology, Kattankulathur during 10th Nov 2021 to 12th Nov 2021 on "Role of Machine Learning in Biomedical Image Processing".
- Dr. Prabir Saha delivered a talk at Narula Institute of Technology Kolkata during 24th January 2022-31st January 2022 on "DSP Processor, Implementation, and Prospects"
- Dr. P. Rangababu delivered a talk at "Advanced applications of Robotics and IOT" Department of Electronics & Communication Engineering is organizing an FDP on "Advanced applications of Robotics and IOT" March 29th-4th April 2022 in Hybrid mode at Atria Institute of Technology, Bengaluru.
- Dr. P. Rangababu delivered a talk on "Sensor interfacing with Embedded Systems" ATAL FDP "MEMS Technology & Microsensors;"on AICTE Training and Learning (ATAL) Academy from 26 to 30 July 2021 at NIT Meghalaya, Shillong.
- Dr. P. Rangababu delivered a talk on "IoT-based Power Management in Smart Grids" on IoT Interfaced Smart Grid Technology (IISGT-21)" from 09- 13 August 2021 being conducted by the Department of Electrical and Electronics Engineering Gayatri Vidya Parishad College of Engineering (A), Visakhapatnam
- Dr. Ch. V. Rama Rao delivered a talk on " Research and development in usage of machine learning for acoustic signal processing" in the workshop on "Application of Machine Learning for Communication and Signal Processing" being organized by Dept. of Electronics and Communication Engineering, NIT Meghalaya during 22nd – 26th November 2021.
- Dr. Ch. V. Rama Rao delivered a talk on "Noise Reduction Techniques" in the workshop on "Signal Processing for Cognitive Science Applications" sponsored by AICTE Training and Learning (ATAL) Academy from 17 to 21 January 2022 at NIT Meghalaya.

## 10. Awards Won/ Recognition received at the National and International level:

- Dr. Shraavan Kumar Bandari received an award of "Young Faculty in Communication Engineering" for his contribution and achievement in the discipline of Engineering from the Center for Advanced Research and Design, Venus International Foundation for the year 2021.
- Dr. Shubhankar Majumdar: Session Chair in ISES 2021.
- Dr. Shubhankar Majumdar: Session Chair in VLSIDCS 21
- Dr.P. Rangababu, and Dr.Ch. V Ramarao chairing sessions on ICEPE-20 held at NIT Meghalaya on 5th to 7th March 2021.

## 11. New Laboratories Setup/Upgradation of existing Labs:

Sl. No.	Laboratory	Major Equipment & Software	Cost (Rupees in lakhs)
1	Basic Electronics	Emona Net Circuits + All addon Boards	32,49,750.00
2	Communication System	Emona netTMS-FreeWire for Analog and Digital Communication systems Lab	26,14,500.00
3	Communication System	USRP Software defined Radio Device-USRP 2953R	34,97,277.00
4	RF & Microwave	Altair Multiphysics/mechatronics Engi-neering Bundle	29,92,500.00

## 12. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr Ch V Rama Rao	Chairman, Centre For Innovation Incuba-tion and Entrepreneurship	July 2019-Till date
		Startup Coordinator, TEQIP III	01-07-2021-Till Date
		Coordinator, B. Tech Admission 2021	2021-22 Academic Year
		Coordinator, coordination committee to implement the activities under the MoU signed between NESAC and NIT Megha-laya	16-03-2021 to Till Date
2	Dr. P. Rangababu	Digital Signal Processing Laboratory	14-06-2017 to Till Date
		PIC (PG & PhD-AA)	Oct 2018-till date
		HOD, EC	July 2019-till date
		Nodal officer, Academics TEQIP-3	May 2019- till date
3	Dr. Pradeep Kumar Rathore	Microprocessor and Microcontroller lab in charge, EC	July 2017-till date
		Professor-in-charge, Centre for Technol-ogy Enabled Learning	Jan 2019 - till date
		Faculty Advisor, B. Tech. EC 2019 Batch	7/1/2019 - till date
4	Dr. Shubhankar Majumdar	Swayam Coordinator, NIT Meghalaya	8/1/2020 - till date
		Warden of Lapalang-1 Boys Hostel	July 2018- till date
		Faculty In-charge of Departmental Sta-tionary	July 2018- till date
		In Departmental NBA Committee	July 2019 -till date
		Member of Startup Cell	July 2018- till date
		Institute level IQAC member - Criteria 9 NBA	July 2019- till date
		Faculty Advisor of B. Tech EC batch 2018	July 2019 -till date
		Faculty In-charge of Coding Club	July 2019 -till date
Convener of Innovation & Entrepreneur-ship Club	Oct 2020 -till date		

Sl. No.	Name of Faculty	Responsibilities	Duration
5	Dr. Abhishek Sarkhel	Member of UG PEC	June 2019 to till date
		Member of Library Committee	June 2018 to till date
6	Dr. Satyendra Singh Yadav	Deputy Faculty In-Charge, Computer Center	February 2020- till date
7	Dr. Prabir Kumar Saha	Member of PG PEC	June 2019 to Till Date
		DSD Lab In-charge	July 2018 to till date
		Warden Lapalang -IV boys Hostel	July 2021 to Till Date
8	Dr. Bishnulatapm Pushpa Devi	High Performance computing Lab In-charge	Jan 2020 - Till date
		Departmental website maintenance In-charge	Jan 2020- Till Date
9	Dr. Salam Shuleenda Devi	Digital Image Processing Lab In- Charge	Jan 2020-Till date
		Warden of Nongthymmai Girls Hostel	July 2021-Till Date
		Faculty Advisor of M. Tech 2021 Batch	July 2021-Till Date
		Member, Ph.D. (PT and FT-EC) applications scrutiny committee	Dec 2021, May 2022
		Verifying Official (ECE) for M. Tech Admission 2021	September 2021
		Member, Local Purchase Committee of Institute	March 2022
10	Dr. Shravan Kumar Bandari	Warden - Lapalang 2 boys hostel	July 2021-Till Date
		Faculty Advisor of B. Tech 1st year - 2021 batch	July 2021-Till Date
		Member, Student Activity Centre - Technical Committee	Aug-2020 to Aug-2022
		Member, Intellectual Property Committee (IPC)	Dec-2020 to Dec-2022
		Screening committee- Study in India (SII)	June 2021
		Verifying Official (ECE) for B. Tech Admission 2021	Dec 2021
		Communication Systems Lab In-charge	Jan 2020 - till date
	Ph.D. (PT-EC) applications scrutiny	June 2021	

### 13. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. Anup Dandapat	IEEE
2	Dr. Ch. V. Rama Rao	IEEE, IETE and ISCA
3	Dr. P. Rangababu	IEEE (SM), IETE (F), IEI
4	Dr. Prabir Saha	IEEE, IETE, IAENG
5	Dr. Shravan Kumar Bandari	IEEE
6	Dr. Pradeep Kumar Rathore	IEEE
7	Dr. Shubhankar Majumdar	IEEE, URSI, ECS, IAENG

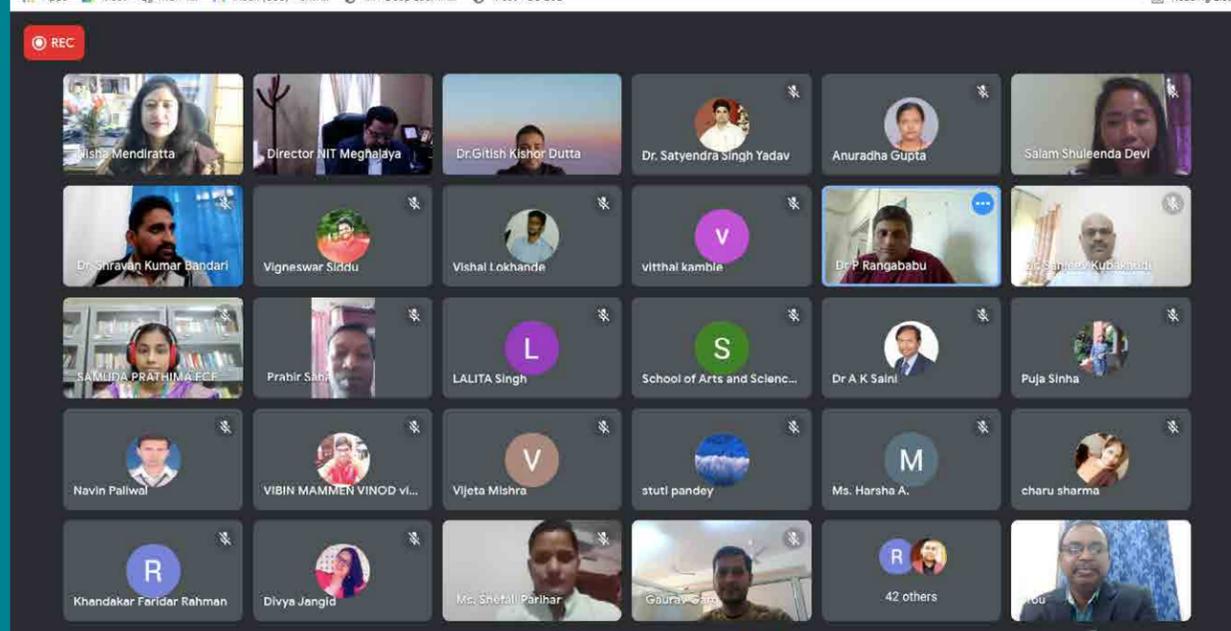
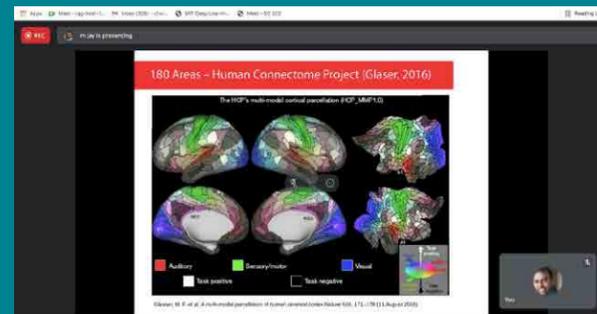
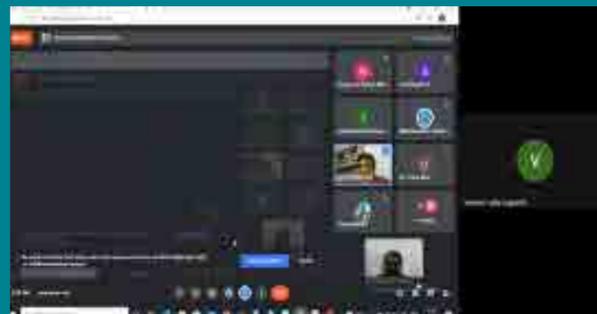
### 14. Any Other Notable Information:

Sl. No.	Name of Faculty	Technical Assistance	Name of Journal/Conference
1	Dr. A. Dandapat	Reviewer	a) IEEE b) IET c) Elsevier d) Taylor & Francis
2	Dr Ch V Rama Rao	Reviewer	a) IET Signal Processing
3	Dr,P,Rangababu	Reviewer	a) IEEE ACCESS b) IEEE BROADCAST c) IEEE TCAS-I d) TCSVT
4	Dr. Prabir Kumar Saha	Reviewer	a) Elsevier b) Springer c) Electronics Journal d) Ain Shams Engineering Journal
5	Dr. Shubhankar Majumdar	Program Chair & Reviewer for the conference	a) VLSID 21 b) VDAT 21 c) IEEE Sensor d) iSES e) VLSI-DCS 2022 Conference
		Reviewer for the journals	a) IEEE TED b) IEEE MWCL c) IEEE Access d) Wiley IJNM e) RFCAD f) Springer JCEL g) Silicon h) Elsevier Microelectronics Journal
6.	Dr. Abhishek Sarkhel	Reviewer	a) Willy International Journal of RF and Microwave Computer-Aided Engineering
7	Dr. Shravan Kumar Bandari	Reviewer	a) IEEE Transactions on Wireless Communications (IEEE) b) IEEE Wireless Communications Letters (IEEE) c) IEEE Communications Letters (IEEE) d) IET Communications e) IET Generation, Transmission and Distribution f) AEU- International Journal of Electronics and Communications (Elsevier) g) Physical Communication (Elsevier) h) International Journal of Communication Systems (IJCS, Wiley) i) Transactions on Emerging Telecommunications Technologies (ETT, Wiley) j) ICT Express (Elsevier), IETE Journal of Research (Taylor & Francis) k) KSII Transactions on Internet and Information Systems
8	Dr. Satyendra Singh Yadav	Reviewer & TPC Member	a) IEEE Access b) Wiley

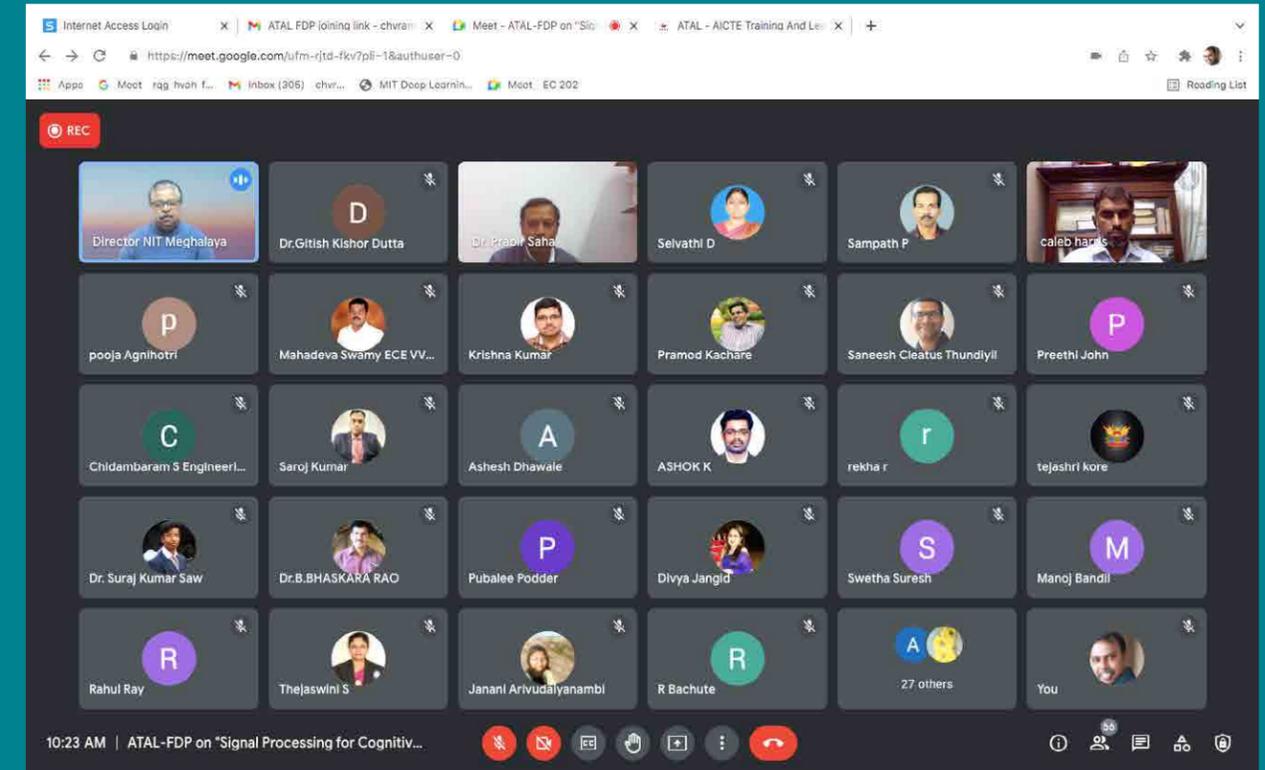
### 15. Departmental activities in Photographs



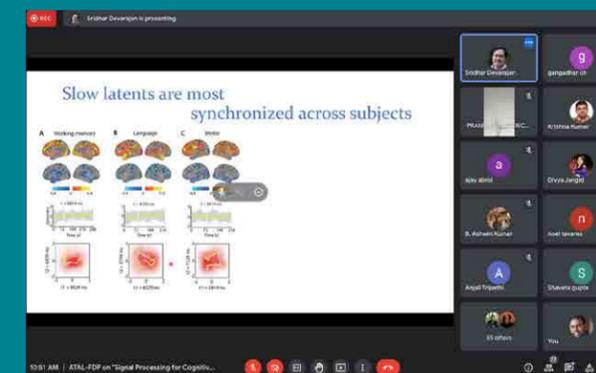
Custom IC Design from Simulation and verification to Tape-out funded by SMDP 16-09-21 to 20-09-21 at NIT Meghalaya, Shillong.



Inaugural session of the workshop on "Signal Processing for Cognitive Neuroscience Applications" which is held on 2-11-2021



Inaugural session of the workshop on "Signal Processing for Cognitive Neuroscience Applications" which is held on 17-01-2022



Five Days National Workshop on "Application of Machine Learning for Communication and Signal Processing", 22nd – 26th Nov 2021

# Department of Mechanical Engineering

## 1. Brief Introduction to the Department:

The department of Mechanical Engineering started functioning its academic curriculum from the session July 2013. The department consists of combination of bright, young and highly potential experienced faculty members. The main objective of the department is to cater the students with class tutorial and in hand practice with the state-of-the-art laboratories & workshop. The basic aim of the department is to provide the students with perfect principles and practice in mechanical engineering, which helps them to serve the society and address a variety of needs. Another, objective of the department is to come up with courses containing interdisciplinary concepts keeping in view of

the advancement of today's world in the field of robotics, mechatronics, nanotechnology etc. The department also plans to have industry-academic collaboration so that both can complement each other in study, research and overall development.

## 2. Programmes Offered:

- Bachelor of Technology in Mechanical Engineering (intake capacity: 30 per year)
- Master of Technology in Mechanical Engineering with specialization in Fluids and Thermal Engineering (intake capacity: 20 per year)
- Doctor of Philosophy in Mechanical Engineering (in respective specializations)

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Prof. Bibhuti Bhusan Biswal	Professor	PhD	Production Engineering	18/05/2017	23	
Prof. Harish Chandra Das	Professor	PhD	Thermal	28-12-2017	6	on going
Dr. Rabindra Narayan Mahapatra	Associate Professor	PhD	Design and manufacturing	28-12-2017	5	1 awarded and 4 ongoing
Dr. Subhendu Maity	Assistant Professor	PhD	Fluid Mechanics	July 16, 2012	3	(one with Dr. Bikash Kr Sarkar)
Dr. Deba Kumar Sarma	Associate Professor	PhD	Manufacturing	August 23, 2013	5	3 awarded 2 continuing
Dr. Bikash Kumar Sarkar	Assistant Professor	PhD	Fluid Power and Control	August 21, 2013	4	(1 Completed as Co-supervisor) 1 shared with Dr. Subhendu Maity

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Dr. Biplab Kumar Debnath	Assistant Professor	PhD	Thermal	July 30, 2014	4	2 Continuing, 2 awarded (one co-guided by Dr. R.S. Das and 1 guided by Dr. K. Das)
Dr. Koushik Das	Assistant Professor	PhD	Thermal	July 31, 2014	6	1 completed (Co-guided by Dr. B. K. Debnath), 5 ongoing
Dr. Rajat Subhra Das	Assistant Professor	PhD	Thermal	July 16, 2015	5	2 Awarded; 3 ongoing; Shared with Dr. B.K. Debnath, Dr. B. K. Sarkar & Dr. K. Das
Dr. Kishore Debnath	Assistant Professor	PhD	Manufacturing	July 16, 2015	5	2 Awarded, 1 Submitted, 2 ongoing/Shared with Dr. D.K. Sarma, Dr. T. Bose, & Dr. R.N. Mahapatra
Dr. Pallekonda Ramesh Babu	Assistant Professor	PhD	Machine Design	July 27, 2015	3	One completed (Sharing with Dr. M. Rahang) Two on going
Dr. Maneswar Rahang	Assistant Professor	PhD	Manufacturing	June 06, 2016	2	1 Shared with Dr. Pallekonda Ramesh Babu
Dr. Tanmoy Bose	Assistant Professor	PhD	Machine Design	June 17, 2016	3 Student	All ongoing, 1 Co-guidance with Dr. Kishore Debnath
Dr. Md Nur Alom	Trainee Teacher	PhD	Fluids and Thermal	July 21, 2014	N.A.	Not Allotted
Avilash Sahoo	Trainee Teacher	M.TECH	Machine Design	July 21, 2014		
Sambit Majumder	Trainee Teacher	M.TECH	Fluids and Thermal	July 20, 2015		

## 4. List of Publications:

### a. Journals:

Sl. No.	Authors	Publication details
1	A. Das, D. Barrenkala, K. Debnath, P.K. Chauhan, R. Raman, and S.K. Patel	Comparative Assessments of Machining Forces in 3D Printed Polymer Composite during Milling Operation Using Two Coated Carbide End Mills. <i>Materials Today: Proceedings</i> . (Accepted)
2	H. Dutta, K. Debnath, and D.K. Sarma	Experimental Investigation of Parametric Effects and Characterization of the Machined Surface in $\mu$ ED-milling of CFRP Composite. <i>Arabian Journal for Science and Engineering</i> . (Accepted)
3	S.K. Yadav, A. Singh, and K. Debnath	Experimental Study of Hole Overcut and Taper During Electrochemical Discharge Machining (ECDM) of CFRP Composite. <i>Materials Today: Proceedings</i> . (Accepted)
4	S. Kesarwani, R.K. Verma, and K. Debnath	Modified JAYA Algorithm for Machinability Assessment and Conflicting Response Optimization during Milling of Nanostructured Carbon Onions Reinforced Epoxy Composites. <i>Experimental Techniques</i> . (Accepted)
5	K. Debnath, M. Roy Choudhury, S. Chaitanya, I. Singh, and T.S. Srivatsan	Drilling of Injection Moulded Natural Fiber-Reinforced Composites Using Different Drill Bits: Analysis of Force, Temperature, and Damage. <i>International Journal of Precision Technology</i> . (Accepted)
6	M. Roy Choudhury and K. Debnath	Analysis of Hybrid Joint of Green Composites under Tensile and Compressive Loading. <i>Green Materials</i> , 2021. (Accepted)
7	M. Roy Choudhury, G. Surya Rao, K. Debnath, and R.N. Mahapatra	Analysis of Force, Temperature, and Surface Roughness during End Milling of Green Composites. <i>Journal of Natural Fibers</i> , 2021. (Accepted)
8	R. Davis, A. Singh, K. Debnath, R.M. Sabino, K. Papat, P. Soares, A.K. Keshri, and B. Borgohain	Enhanced Micro-Electric Discharge Machining-Induced Surface Modification on Biomedical Ti-6Al-4V Alloy. <i>Journal of Manufacturing Science and Engineering</i> , Vol. 144(7), 071002, 2022.
9	A. Kumar, O. Vichare, K. Debnath, and M.K. Paswan	Fabrication Methods of Metal Matrix Composites (MMCs). <i>Materials Today: Proceedings</i> , Vol. 46, pp. 6840-6846, 2021.
10	H. Dutta, K. Debnath, and D.K. Sarma	Investigation on Cutting of Thin Carbon Fiber-Reinforced Polymer Composite Plate Using Sandwich Electrode-Assisted Wire Electrical-Discharge Machining. <i>Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering</i> , Vol. 235(5), pp. 1628-1638, 2021.
11	R. Davis, A. Singh, K. Debnath, R.M. Sabino, K. Papat, L.R.R. da Silva, P. Soares, and A.R. Machado	Surface Modification of Medical-Grade Ni55.6Ti44.4 Alloy via Enhanced Machining Characteristics of Zn Powder Mixed- $\mu$ -EDM. <i>Surface and Coatings Technology</i> , Vol. 425, 127725, 2021.
12	R. Davis, A. Singh, K. Debnath, M.J. Jackson, P. Soares, F.L. Amorim, and H. Dutta	Effect of Powder Particle Concentration and Tool Electrode Material amid Zinc Powder-Mixed $\mu$ EDM of Biocompatible Mg Alloy AZ91D. <i>Journal of Materials Engineering and Performance</i> , Vol. 30(8), pp. 5704-5718, 2021.
13	G. Surya Rao, K. Debnath, and R.N. Mahapatra.	Finite Element Analysis of Low-Velocity Impact Behavior of Green Composites. <i>Materials Today: Proceedings</i> , Vol. 46, pp. 1290-1297, 2021.
14	H. Dutta, K. Debnath, and D.K. Sarma	Improving the Micro-Electrical-Discharge Drilling Performance of Carbon Fiber-Reinforced Polymer: Role of Assisting-Electrode and Shaped Tool. <i>International Journal of Machining and Machinability of Materials</i> , Vol. 23(2), pp. 191-207, 2021.

Sl. No.	Authors	Publication details
15	D. Prakash, M. Tariq, R. Davis, A. Singh, and K. Debnath	Influence of Cryogenic Treatment on the Performance of Micro-EDM Tool Electrode in Machining of Magnesium Alloy AZ31B. <i>Materials Today: Proceedings</i> , Vol. 39, pp. 1198-1201, 2021.
16.	Singh, M.A., Das, K., Sarma, D. K. (2021)	Development and experimental validation of numerical formulations of a heuristic model in WEDM of H13 tool steel. <i>Int. J. of Machining and Machinability of Materials</i> , 23 (4), 348-368
17.	Das, A., Das, R.S., Das, K. (2022)	Performance enhancement of a liquid desiccant absorber with triangular corrugated structured packing, <i>Journal of Building Engineering</i> , 45, 103677
18.	Kashyap, U., Das, K., Debnath, B. K., Kashyap, U., Saha, S. K. (2021)	Numerical study on effect of secondary surface on rectangular vortex generator, <i>J. Thermal Sci. Eng. Appl.</i> 13(1): 011005
19.	Das, A., Das, R.S., Das, K. (2022)	Performance analysis of aqueous LiCl and CaCl <sub>2</sub> based falling film dehumidifier with surface modification, <i>Applied Thermal Engineering</i> , 200, 117704
20.	Chandekar, A. C., & Debnath, B. K. (2022).	Computational analysis of mixing characteristics of port-injected bioCNG with air for different designs of intake manifold. <i>Progress in Computational Fluid Dynamics</i> , an International Journal, 22(1), 37-50.
21.	Chandekar, A. C., Deka, S., Debnath, B. K., & Babu, P. R. (2022)	Comparative Assessment of Engine Vibration, Combustion, Performance, and Emission Characteristics Between Single and Twin-Cylinder Diesel Engines in Unifuel and Dual-Fuel Mode. <i>Journal of Energy Resources Technology</i> , 144(8).
22.	Das, S., Debnath, B. K., & Das, R. S. (2021)	Experimental investigation of porous media combustion applied on the piston bowl of diesel engine. <i>Journal of the Brazilian Society of Mechanical Sciences and Engineering</i> , 43(3), 1-14.
23.	Milan K Mondal, Nirmalendu Biswas, Aparesh Datta, <b>Bikash K Sarkar</b> , Nirmal K Manna	"Positional impacts of partial wall translations on hybrid nanofluid flow in porous media: Real Coded Genetic Algorithm (RCGA)," <i>Int. J. Mech. Sci.</i> , p. 107030, Dec. 2021, doi: 10.1016/j.ijmecsci.2021.107030
24.	<b>P. Venkaiah</b> and B. K. Sarkar,	"Electrohydraulic proportional valve-controlled vane type semi-rotary actuated wind turbine control by feedforward fractional-order feedback controller," <i>Proc. Inst. Mech. Eng. Part J. Syst. Control Eng.</i> , p. 095965182110284, Jul. 2021, doi: 10.1177/09596518211028417
25.	L. Kushwaha, P. Venkaiah, and <b>B. K Sarkar</b> ,	Performance analysis of vertical axis wind turbine with optimised pitch angle variation," vol. 28, no. 2, p. 8, 2021.
26.	N. Kumar, R. Kumar, <b>B. K. Sarkar</b> , and S. Maity	Performance Analysis of the Swashplate Axial Piston Pump with Hydraulic Fluid Temperatures," vol. 80, p. 6, 2021.
27.	V. J and <b>B. K. Sarkar</b> ,	"Francis turbine electrohydraulic inlet guide vane control by artificial neural network 2 degree-of-freedom PID controller with actuator fault," <i>Proc. Inst. Mech. Eng. Part J. Syst. Control Eng.</i> , vol. 235, no. 8, pp. 1494–1509, Sep. 2021, doi: 10.1177/0959651820973797.
28.	<b>Sambit Majumder</b> , Arnab Ghosh, Dipankar Narayan Basu, Ganesh Natarajan	"Re-examining the partially saturated-cells method for incompressible flows with stationary and moving bodies", <i>Computers and Mathematics with Applications</i> , 110 (2022) 19-39, doi: 10.1016/j.camwa.2022.01.034
29.	Talukdar, P. K., <b>Alom, N.</b> , Rathod, U. H, and Kulkarni, V.	Alternative Blade Profile based on Savonius Concept for Effective Wind Energy, <i>ASME Journal of Energy Resources Technology</i> , 2021, Vol.144, No: 4, p:041304
30.	<b>Alom, N.</b> , Saha, U. K., and Dewan, A.,	In the Quest of an Appropriate Turbulence Model for Analyzing the Aerodynamics of a Conventional Savonius (S-type) Wind Rotor, <i>Journal of Renewable and Sustainable Energy</i> , 2021, Vol. 13, issue 2, p. 023313

Sl. No.	Authors	Publication details
31	Mohapatra S, Behera A, Kumar, Mahapatra R. N., Das H. C., Pradhan M. K.	A deterministic inventory model of aluminium refreshment cans in reverse supply chain, <i>International Journal of Services and Operations Management</i> , 2021, Vol.39, issue 2, p.151-180
32	Mohapatra S, Behera A, Kumar, Mahapatra R. N, Das H. C	Effect of Big Data Analytics in Reverse Supply Chain: An Indian Context, <i>International Journal of Information Systems and Supply Chain Management</i> , 2022, Vol 15, issue 1, P.1-14
33	Adhikari. B., Behera A, Kumar, Mahapatra R. N, Das H. C.	Cell Phone Related Violations and Motorcycle Accidents: A Bayesian Approach, <i>Operational research in engineering sciences: theory and applications</i> , 2021, Vol 4, issue 3, P.107-121
34	Sahu, P. K., Mahapatra, R. N., Mishra U, S.	Review Of Literature On Sustainable Supply Chain Management-An Emerging Economy, <i>NATURAL VOLATILES &amp; ESSENTIAL OILS Journal</i> , 2021, Vol 8, Issue 4, P. 5521-5536.
35	Acharya, B, Mahapatra, R. N., Rath, A.K.	A Study on Human Resource Management Practices and its Impact on Employee Retention in Jindal Steel and Power Limited, <i>Turkish Online Journal of Qualitative Inquiry</i> , 2021, Vol. 12, Issue 10, P. 5847-5861.
36	Rabiteja Patra, Shreeshan Jena, Harish Chandra Das, Asita Kumar Rath	Patra, R., Jena, S., Das, H. C., & Rath, A. K. (2022). FINITE ELEMENT ANALYSIS OF FEMORAL PROSTHESIS UNDER TRANSIENT LOADING FOR MULTIPLE ACTIVITIES OF DAILY LIVING. <i>Biomedical Engineering: Applications, Basis and Communications</i> , 34(02), 2250016.
37	Rashmi Ray, Sankar Narayan Das, Harish Chandra Das, Asutosh Das	Ray, R., Das, S. N., Das, H. C., & Das, A. (2022). Mechanical, thermal and microstructural studies of Bauhinia Vahlil fiber reinforced polypropylene composite. <i>Polymer Composites</i> , 43(3), 1319-1329.
38	Umakanta Patel, Rashmi Ray, Abhipreet Mohapatra, Sankar Narayan Das, Harish Chandra Das	Patel, U., Ray, R., Mohapatra, A., Das, S. N., & Das, H. C. (2022). Effect of different chemical treatments on surface morphology, thermal and tensile strength of bauhinia vahlii (BV) stem fibers. <i>Journal of Natural Fibers</i> , 19(1), 280-291.
39	Pradipta Kumar Dash, Shakti Prakash Jena, Harish Chandra Das	Dash, P. K., Jena, S. P., & Das, H. C. (2022). Thermodynamic study in a diesel engine using karanja biodiesel-diethyl ether-producer gas. <i>International Journal of Advanced Technology and Engineering Exploration</i> , 9(86), 16.
40	Ajay Kumar Behera, Sasmita Mohapatra, Rabindra Mahapatra, Harish Das	Behera, A. K., Mohapatra, S., Mahapatra, R., & Das, H. (2022). Effect of Big Data Analytics in Reverse Supply Chain: An Indian Context. <i>International Journal of Information Systems and Supply Chain Management (IJISSCM)</i> , 15(1), 1-14.
41	Biranchi Adhikari, Ajay Behera, Rabindra Mahapatra, Harish Das	Adhikari, B., Behera, A., Mahapatra, R., & Das, H. (2021). Cell phone related violations and motorcycle accidents: a Bayesian approach. <i>Operational research in engineering sciences: theory and applications</i> , 4(3), 107-121.
42	Pradipta Kumar Dash, Shakti Prakash Jena, Harish Chandra Das	Dash, P. K., Jena, S. P., & Das, H. C. (2021). Combustion and Performance Analysis of a Dual-fuel Diesel Engine Using Producer Gas.
43	Sasmita Mohapatra, Ajay Kumar Behera, Rabindra Narayan Mahapatra, Harish Chandra Das, Malay Kumar Pradhan	Mohapatra, S., Behera, A. K., Mahapatra, R. N., Das, H. C., & Pradhan, M. K. (2021). A deterministic inventory model of aluminium refreshment cans in reverse supply chain. <i>International Journal of Services and Operations Management</i> , 39(2), 151-180.

## b. Book Chapters:

Sl No.	Author Name	Title	Publisher	ISBN No	Pages	Year
1	P.K. Kharwar, R.K. Verma, K. Debnath, and A. Singh	Synthesis of Catalyst-Free Carbon Nano Onions (CNOs) for Advanced Functional Materials	AIP Publishing	978-0-7354-2391-6	8-18-22	2022
2	K. Debnath and G. Surya Rao	Role of Different Forms of Bamboo and Chemical Treatment on the Mechanical Properties of Compression Molded Green Composite	Springer	978-981-16-8899-7	107-124	2022
3	M. Roy Choudhury and K. Debnath	Current and Future Trends in Micro-Joining and Nano-Joining. In <i>Joining Processes for Dissimilar and Advanced Materials</i>	Elsevier	9780323860208	209-238	2022
4	A. Gaikwad, K. Debnath, and M.K. Gupta	Nano-Structured Polymer-Based Composites. In <i>Advances in Machining of Composite Materials: Conventional and Non-Conventional Processes</i>	Springer	9783030714376	335-367	2021
5	M. Roy Choudhury and K. Debnath	Machining of Bio-Composites	Springer	9783030714376	421-457	2021
6	M. Roy Choudhury and K. Debnath	Green Composites: Introductory Overview	Springer	978-981-15-9643-8	1-20	2021
7	G. Surya Rao, K. Debnath, and R.N. Mahapatra	Development and Characterization of PLA-based Green Composites: Experimental and Simulation Studies	Springer	978-981-15-9643-8	209-223	2021
8	K. Debnath, M. Roy Choudhury, G. Surya Rao, and R.N. Mahapatra	Milling Behavior of Injection Molded Short Fiber-Reinforced Green Composites. In <i>Machining and Machinability of Fiber Reinforced Polymer Composites</i>	Springer	978-981-33-4153-1	149-171	2021
9	K. Debnath, H. Dutta, and D.K. Sarma	Influence of Different Tool Materials on the Machining Performance in $\mu$ ED-Milling of CFRP Composites. In <i>Machining and Machinability of Fiber Reinforced Polymer Composites</i>	Springer	978-981-33-4153-1	207-224	2021
10	Francis Kurbah, Shemphang Marwein, Teiborlin Marngar, Bikash Kumar Sarkar	Design and development of the pineapple harvesting robotic gripper Communication and Control for Robotic Systems 229,	Springer	978-981-16-1777-5	437-45	2022
11	J Vinod, BK Sarkar	Integral Sliding Mode Controller Design for Francis Turbine Electrohydraulic IGV System Advances in Thermofluids and Renewable Energy,	Springer	978-981-16-3497-0	277-286	

SI No.	Author Name	Title	Publisher	ISBN No	Pages	Year
12	Pradipta K Dash, Harish C Das, Shakti P Jena	Investigation on combustion parameters of a producer gas-biodiesel-diethyl ether operated dual fuel engine	Elsevier			2022
13	Shashendra Kumar Sahoo, Loknath Panda, Harish Chandra Das	Nonlinear Dynamics of Axially Accelerating String	Springer	978-981-33-4795-3	589-598	2021
14	Shashendra Kumar Sahoo, HC Das, LN Panda	An Overview of Transverse Vibration of Axially Travelling String	Springer	978-981-15-9817-3	427-446	2021
15	Shashendra Kumar Sahoo, Loknath Panda, Harish Chandra Das	Dynamic Instability of Cantilever Pipe Conveying Fluid	Springer	978-981-33-4795-3	149-157	2021

### C. Conferences:

SI. No.	Authors	Publication details
1.	Saroja Ranjan Pattanayak, Paladugu Venkaiah, <b>Bikash Kumar Sarkar</b> , Binayak.	Modelling and control of parabolic trough field system for feed water heating application 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer, IIT
2.	CJ Ramana, Garg S., Bora BJ, Buradi A., Roy S., Sharma, P., and <b>Alom, N.,</b>	Influence of Pressure in RO Filtration of Crude Biodiesel, AUA Academic Conference on Sustainable Energy and Green Technology, 21-23 February 2022
3.	Shukla, S., Bora, B.J., Deo, A., <b>Alom, N.,</b>	Numerical Analysis of Vertical Axis Wind Turbine Blades in ANSYS Fluent, Material Tech 2022, January 28-29, 2022, NIT Raipur, India (Material Today Proceedings:)
4.	CJ Ramana, Shukla, S., Bora BJ, <b>Alom N,</b> and Buradi A	CFD Investigation of Crude Biodiesel Filtration using Reverse Osmosis Membrane, International Conference on Thermo-fluids and Manufacturing Science-2022 at Kalinga Institute of Industrial Technology, January 24-25, 2022, Bhubaneswar, Odisha (KIIT ICTMS 2022).
5.	CJ Ramana, Bora BJ, Roy S, <b>Alom N,</b> and Buradi A,	CFD Analysis of Pressure and Velocity distribution in Novel Reverse Osmosis Filtration of Crude Biodiesel, Proceedings of the 48 <sup>th</sup> National Conference on Fluid Mechanics and Fluid Power (FMFP) December 27-29, 2021, BITS Pilani, Pilani Campus, RJ, India
6.	<b>Alom N.,</b> and Sarkar B.K.,	Effect of Exit Blade Angle on the Performance of Cross-Flow Hydro Turbine: A Numerical Study, Paper No. GTIndia2021-76037, ASME Gas Turbine India Conference, December 02 – 03, Virtual, online
7	Saroja Ranjan Pattanayak, Paladugu Venkaiah, Bikash Kumar Sarkar, Bikash Pattanayak, Harish Chandra Das	Pattanayak, S. R., Venkaiah, P., Sarkar, B. K., Pattanayak, B., & Das, H. C. (2021). Modelling and control of parabolic trough field system for feed water heating application. In <i>Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference December 17-20, 2021, IIT Madras, Chennai-600036, Tamil Nadu, India</i> . Begel House Inc..

### 5. Workshop Organized:

SI No.	Name of Faculty	Title	Sponsors	National/ International	Duration	Faculty responsibility
1	Dr. Kishore Debnath	Sustainable Green Composites: Design, Manufacturing and Characterization	AICTE	National	One Week	Coordinator
2	Dr. P. Ramesh Babu	FDP on Innovation and Entrepreneurship	AICTE	National	22nd to 26th March 2022	Coordinator
3	Dr. B. K. Sarkar and Dr. R. S. Das	Controller design and implementation for Renewable energy system	AICTE	National	7th to 11th March 2022	Coordinator and Co-Coordinator
4	Dr.R.N. Mahapatra	FDP on Recent advances in Mechanical Engineering	TEQIP	National	4th Aug to 8th Aug 2021	Coordinator

### 6. Conferences / Workshops / Seminars / Trainings Attended by Faculty Members:

SI. No.	Name of Faculty	Name of the programme attended	Duration
1	Mr. Sambit Ma-jumder	"4-day, 12-hour TRNSYS Training Webinar" conducted by Thermal Energy System Specialists	April 26-29, 2021
2	Dr. Biplab Kumar Debnath	Invited Talk in the Webinar on "Petroleum Products Price Hike in India Heading Towards Alternative Fuels"- at Gandhi Institute for Education & Technology, Baniatangi, Khurda, Odisha, India	13th August 2021
3	Dr. Md Nur Alom	2nd International Workshop on In-stream Hydro-kinetic organized at the Department of Hydro and Renewable Energy (HRED), IIT Roorkee	September 27-28, 2021.

### 7. Projects:

#### a) Sponsored Projects:

SI. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount	Duration	Status
1	Development and Testing of Solar Photovoltaic (PV) Assisted Hybrid Double-Slope Desalination Solar Still for Off-grid Rural-North East India	P.I.: Dr. Biplab Kumar Debnath, Co-P.I.: Dr. Rajat Subhra Das	SERB, DST	29 lakhs	3 years	Ongoing
2.	Design, Analysis and Development of a Low Cost Underwater Vehicle (Mini Submarine) for (a) Tourism Purpose and (b) Biofouling cleaning	Prof. P. S. Robi, Prof. Pankaj Biswas, Prof. S. K. Dwivedy, Prof. H. B Nemade, IIT Guwahati Mr. Avilash Sahoo (Co-P.I) NIT Meghalaya	IIT Guwahati Technology Innovation & Development Foundation	87 lakhs	3 Years	On going
3	"Calculation of productivity Index for the plate mill of Jindal steel and power limited and Remedial Measure, Angul, Odisha & quot;	Dr.R.N. Mahapatra	Jindal Steel and Power Limited, Angul. Od-isha	1,18 lakhs	1 year	On going

## b) Consultancy:

Sl. No.	Title	Consultant(s)	Client(s)	Value	Status
1.	Technical vetting and modification of Boiler Unit 1 & 4, Registration number OR-1153 & OR -1184 of da, Od-isha	Prof. H. C. Das and Dr. B. K. Sarkar	Vedanta Limited, Jharsuguda	Rs. 2,36,000/-	Completed
2.	Hydra Crane Runover Protection Guard De-sign	Dr. B. K. Sarkar, Prof. H. C. Das, Dr. T. Bose	(Jindal steel and power limited)	Rs. 1,18,000/-	Completed

## 8. Laboratories Setup:

Sl. No.	Faculty	Laboratory	Major Equipment & Soft-ware	Location	Cost (Rupees in lakhs)
1	Dr. Kishore Debnath (Chair-man)	Central Work-shop	Almost all equipment related to right different shops.	NIT Meghalaya Permanent Campus at Sohra	Approximately 10 Cr.
2		THERMAL SCIENCE LAB	Twin Cylinder CRDi, Turbocharged, Automotive Dual Fuel Research Engine Test Set-up with Open ECU (TEQIP-III funded)	NIT Meghalaya	27,15,237
3		Computational Laboratory	Materialize MIMICS Implants Design Software		27,49,267
			Ansys Granta Edu Pack		17,32,500
			COMSOL Multiphysics Software		20,87,000
			3D Experience Engineer		29,85,905
4		Material Science Laboratory	Spark Based OES		40,32,000
5		Metrology and Instrumentation Lab	Helium Cylinder with accessories	NIT Meghalaya	55,625

## 9. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr. Biplab Kumar Debnath	Vice President - Cultural, Student Activity Centre	August, 2020 - till date
2	Dr. P. Ramesh Babu	Convener, Routine Committee	July 2021- Till Date
3	Dr. B. K. Sarkar	PIC, Centre for Robotics and Mechatronics	July 21 to June 23
4	Dr.R.N. Mahapatra	<ul style="list-style-type: none"> <li>HOD, ME</li> <li>Convener CPDA Committee</li> </ul>	<ul style="list-style-type: none"> <li>Jul2021 cont.</li> <li>Jul 2021 cont.</li> </ul>

## 10. Membership of Professional Bodies:

Name	Professional Body	Membership No. and status
Dr. Md Nur Alom	ASME	102089520, Member
Dr. Rajat Subhra Das	ASHRAE	8225241, Member
Dr. D.K. Sarma	Indian Welding Society	Life member
Mr. Avilash Sahoo	ASME	102607760, Member
	IEEE	94145936
Dr. Bikash Kumar Sarkar	ASME	100784361, Member
	IEEE	92662020, Member
	NSFMFP	LM631, Life member
	ISHMT	1064, Life member
Dr. Subhendu Maity	ASME	100732582, Member
	IEEE	93088281, Member
	NSFMFP	LM635, Life member
	ISHMT	1064, Life member
	ISTE	LM 11112, Life member
	ISTAM	L/1067, Life member
	IEI	AM166945-4, Associate Member
Dr. Biplab Kumar Debnath	SAISE	20151124001, Life Member
	ASME	Member (101982384)
	IEI	Associate Member (AM159023-8)
Sambit Majumder	ASCE	Associate Member (9783236)
	IEI	Associate Member (AM159672-4)

## 11. Any Other Notable Information:

### Invited Talks:

- Delivered a Guest Lecture on **'Electrical Discharge Machining of Partially Conductive Materials'** during International Webinar on "Advanced Manufacturing Technology" Organized by the Department of Mechanical Engineering, Vaugh Institute of Agricultural Engineering and Technology, Prayagraj, India, April 29, 2022.
- Delivered a Talk on **'Primary and Secondary Manufacturing of Green Composites'** during AICTE Training and Learning (ATAL) Five Days Online Faculty Development Program on "Green Technology & Sustainability Engineering" Organized by the Department of Mechanical Engineering, National Institute of Technology Manipur, India, January 10-14, 2022.
- Delivered an Expert Talk on **'Research Scope in Polymer Composites'** during One Week Online Short Term Training Program on "Polymer Composites" Organized by the Department of Mechanical Engineering, St. Francis Institute of Technology, Mumbai, India, January 3-7, 2022.
- Delivered an Expert Talk on **'Processing of Composites'** during One Week Online Short Term Training Program on "Polymer Composites" Organized by the Department of Mechanical Engineering, St. Francis Institute of Technology, Mumbai, India, January 3-7, 2022.

5. Delivered an Expert Talk on **'Processing of Green Composite Materials'** during AICTE Training and Learning (ATAL) Five Days Online Faculty Development Program on "Green Technology" Organized by the Department of Electrical and Instrumentation Engineering, Sant Longowal Institute of Engineering and Technology, Punjab, India, August 23-27, 2021.
6. Delivered a Talk on **'Secondary Manufacturing of Green Composites'** during AICTE Training and Learning (ATAL) Five Days Online Faculty Development Program on "Sustainable Green Composites: Design, Manufacturing and Characterization" Organized by the Department of Mechanical Engineering, National Institute of Technology Meghalaya, India, August 9-13, 2021.
7. Delivered a Talk on **'Processing of Green Composite Materials'** during TEQIP-III Sponsored Faculty Development Program on "Recent Advances in Mechanical Engineering" Organized by the Department of Mechanical Engineering, National Institute of Technology Meghalaya, India, August 4-8, 2021.
8. Delivered a Talk on **'Machining Behaviour of Composite Materials'** during TEQIP-III Sponsored Faculty Development Program on "Recent Advances in Mechanical Engineering" Organized by the Department of Mechanical Engineering, National Institute of Technology Meghalaya, India, August 4-8, 2021.

### Dr. Md Nur Alom

9. On the topic of "Evolution of Vertical Axis Wind Turbines and Its Applications" in the STTP on Recent Developments in Renewable Energy organized by Government Engineering College Bharuch, Gujrat during 4-9th April 2021
10. On the topic of "Experimental Analysis of Savonius Wind Rotors" in the Refresher Program on Small Wind Turbines: Design, Development and Testing phase-II organized by Trinity College of Engineering and Research, Pune during 28th April-4th May 2021
11. On the topic of "Computational Analysis of Cross Flow Hydro Turbine with the Variation of Blade and Nozzle Entry Arc Angle" in the 2nd International Workshop on In-stream Hydrokinetic organized at the Department of Hydro and Renewable Energy (HRED), IIT Roorkee, during Sept.27-28, 2021.

### Avilash Sahoo

12. On the topic of "Principles of Robotics" organized by the Mechanical Engineering Dept., AISSMS College of Engineering, Pune, Feb 12th-13th 2022.
13. Expert talk on "supply chain issues in telecom sectors" at MBBS Logistic and transport from 14th to 16th March 2022 in Bhubaneswar, Odisha.

# Department of Chemistry

## 1. Brief Introduction to the Department:

The Department of Chemistry, National Institute of Technology Meghalaya, started in 2012. In addition to the B.Tech. Chemistry course, the department is also offering two years M.Sc. program in Chemistry from 2015 onwards with all the significant areas of Chemistry such as Inorganic, Organic, Physical, and Theoretical Chemistry. The intake capacity of M.Sc. programme is sixteen (16).

Currently, it is offering Ph.D. programs in broad areas of Chemical Sciences like Organic Chemistry, Inorganic Chemistry, Biophysical Chemistry, Materials Chemistry and Computational Chemistry. Presently, the department has twenty-four (24) PhD students working in various thrust areas.

The department has a total of 05 faculty members who are involved in quality research work apart from their regular teaching and administrative work.

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance (ongoing)
Dr. Gitish K. Dutta	Associate Professor	Ph.D.	Organic and Hybrid Materials (Organic Chemistry)	08-08-2013	03
Dr. Paresh Nath Chatterjee	Associate Professor	Ph.D.	Organometallics and Catalysis (Organic Chemistry)	14-01-2013	06
Dr. Amit Kumar Paul	Assistant Professor	Ph.D.	Theoretical Chemistry (Physical Chemistry)	24-06-2016	04
Dr. Atanu Singha Roy	Assistant Professor	Ph.D.	Biophysical Chemistry (Physical Chemistry)	23-07-2015	06
Dr. Naba Kamal Nath	Assistant Professor	Ph.D.	Crystal Engineering and Energy Converting Smart Materials (Inorganic Chemistry)	28-07-2015	05

The M.Sc. students of the department are encouraged to apply for summer internship programmes in various reputed institutes and universities in the country.

The department is attracting students from various institutes and universities for M.Sc. and PhD. programmes given the concepts of interdisciplinary teaching and research for the advancement in organic materials, nanoscience and technology, biological chemistry etc.

## 2. Programmes Offered:

- i. M.Sc. in Chemistry (2 years) and
- ii. PhD (Full-time and Part-time)

## 4. List of Publications

### International Journals

#### ASR Group

- Haque, M., Lyndem, S., & Singha Roy, A. (2022). Interaction properties of biosynthesized cadmium sulfide quantum dots with human serum albumin: further investigation of antibacterial activities and sensing applications. *Luminescence*, 37(5), 837-853.
- Sarmah, S., Dhurua, S., Belwal, V. K., Lyndem, S., Jana, M., & Roy, A. S. (2022). Combined spectroscopic and computational approaches for the recognition of bioactive flavonoid 6-hydroxyflavone by human serum albumin: Effects of non-enzymatic glycation in the binding. *Journal of Molecular Liquids*, 346, 118288.
- Das, S., Singh, A., Samanta, S. K., & Singha Roy, A. (2022). Naturally occurring anthraquinones as potential inhibitors of SARS-CoV-2 main protease: an integrated computational study. *Biologia*, 1-14.
- Sarmah, S., & Roy, A. S. (2021). A review on prevention of glycation of proteins: Potential therapeutic substances to mitigate the severity of diabetes complications. *International Journal of Biological Macromolecules*, 195, 565-588.
- Haque, M., Santra, S., Paul, D., & Roy, A. S. (2021). Binding of Water-Soluble CdSe Quantum Dots with Human Serum Albumin: Further Studies into their Effects on Dietary Polyphenol Binding and Sensing of Antibiotic Lomefloxacin. *ChemistrySelect*, 6(40), 11144-11156.
- Lyndem, S., Gazi, R., Jana, M., Belwal, V. K., & Singha Roy, A. (2021). Molecular recognition of two bioactive coumarin derivatives 7-hydroxycoumarin and 4-methyl-7-hydroxycoumarin by hen egg white lysozyme: Exploring the binding mechanism, thermodynamic parameters and structural changes using multispectroscopic and computational approaches. *Journal of Biomolecular Structure and Dynamics*, 1-17.
- Baruah, K., Haque, M., Langbang, L., Das, S., Aguan, K., & Roy, A. S. (2021). Ocimum sanctum mediated green synthesis of silver nanoparticles: A biophysical study towards lysozyme binding and anti-bacterial activity. *Journal of Molecular Liquids*, 337, 116422.

#### NKN Group

- Pragyan J. Hazarika Poonam Gupta, Anilkumar Gunnam, Suryanarayana Allu, Ashwini K. Nangia and Naba K. Nath, Photomechanical response of sulfonylhydrazone molecular crystals, *CrystEngComm*, 2021, **23**, 4910-4916.

#### PNC Group

- Kalita, G.; Deka, N.; Paul, D.; Thapa, L.; Dutta, G. K.; Chatterjee, P. N. Sulfonated Tetraphenylethylene-Based Hypercrosslinked Polymer as a Heterogeneous Catalyst for the Synthesis of Symmetrical Triarylmethanes via a Dual C–C Bond-Cleaving Path. 2021; 32(03): 304-308.
- Paul, D.; Kalita, G.; Bora, H. J.; Samai, S.; Chatterjee, P. N. Ultrasound mediated synthesis of aldimines from non-enolizable aldehydes at room temperature. 2021, 60B, 1593-1600.

#### AKP

- H. Mahanta and A. K. Paul\*, Unimolecular Dissociation of C<sub>6</sub>H<sub>6</sub>-C<sub>6</sub>Cl<sub>6</sub> Complex and Effect of Mode-Mode Coupling. *J. Phys. Chem. A* 2021, 125, 27, 5870–5877
- Shyamal Kanti Bera, Palash J. Boruah, Shradha Saraswati Parida, Amit K. Paul\* and Prasenjit Mal\*, A Photochemical Intramolecular C-N Coupling Towards the Synthesis of Benzimidazole- Fused Phenanthridines. *J. Org. Chem.* 2021, 86, 14, 9587–9602
- H. Mahanta, A. K. Paul\*, Dynamical Behavior of Aromatic Trimer Complexes in Unimolecular Dissociation Reaction at High Temperatures. *Case Studies on C<sub>6</sub>H<sub>6</sub>-C<sub>6</sub>F<sub>6</sub>-C<sub>6</sub>H<sub>6</sub> and C<sub>6</sub>H<sub>6</sub>-trimer Complexes. J. Phys. Chem. A.* 2022, 126, 259
- S. Kumar, S. Kumari, S. Singh, P. J. Boruah, A. K. Paul, P. Roy, and H. Joshi, Oxidized Charcoal-Supported Thiol-Protected Palladium Nanoparticles for Cross Dehydrogenative Coupling of Heteroarenes. *ACS Appl. Nano Mater.* 2022, 5, 2644

## 5. Invited Talks (as Resource Person)

Title of the talk	Faculty Name	Event/Institute/University/Place	Duration
Sustainable and greener approaches to organic syntheses	Dr. Paresh Nath Chatterjee	IUPAC Global Women Breakfast-2022 (Empowering Diversity in Science). Department of Chemistry, Synod College, Shillong	90 min
Sustainable and greener approaches to organic syntheses	Dr. Paresh Nath Chatterjee	One Day National Webinar on "New Horizons of Chemistry-2" Bidhan Chandra College, Asansol, West Bengal	60 min
Sustainable and greener approaches to organic syntheses	Dr. Paresh Nath Chatterjee	Refresher Course in Chemistry 2021. Department of Chemistry, North Eastern Hill University, Shil-long	90 min
The Unimolecular Dis-sociation of Weakly Bound Aromatic Com-plexes at High Temper-atures	Dr. Amit K. Paul	Webinar on Spectroscopy and Dynamics of Molecules and Clusters (SDMC)	60 mins
A Unified Model for Simulating Inter-molecular Collisional En-ergy Transfer from a Vibrationally Excited Molecule to a Thermal-ized Bath	Dr. Amit K. Paul	Theoretical Chemistry Symposium	30 mins

## 6. Projects

### a. Sponsored Project (Received / Ongoing / Completed)

Sl. No.	Title of the Project	Investigators (P.I. & Co-P.I.)	Funding Agency	Funding amount	Dura-tion	Status
1	Assessment of climate change impact on soils and various water basins of Meghalaya using existing and newer techniques	Dr. Paresh Nath Chatterjee (PI) + 4 Co-PIs (Dr. Mukul Pradhan, Dr. Snehadri khatua, Dr. Anup Dan-dapat, Dr. Susmita Shar-ma)	DST	Rs. 66,45,175/-	2019-2022	Ongoing
2	QM + MM Chemical Dynamics on Chemical Reactions and Non-Adiabatic Processes in Condensed Phase Molecular Systems	Dr. Amit K. Paul	SERB, DST	Rs. 36,58,000	2018-2021	Ongoing
3	Synthesis of biocompatible silver and Gold nanoparticles using dietary polyphenols as reducing agents: Further investigation into their binding efficacies with the carrier proteins, biomolecular detections, anti-bacterial properties and cell cytotoxicity	Dr. Atanu Singha Roy	SERB (CRG)	Rs. 25,12,400	2020-2023	Ongoing
4	Post Transition State Dynamics On Chemical Reactions and the effect of Solvation	Dr. Amit Ku-mar Paul	CSIR	Rs. 13,96,000	2019-2022	Ongoing
5	Multi-stimuli responsive smart crystalline material derived from organic molecular photoswitch	Dr. Naba Kamal Nath	DST-SERB-CRG	Rs. 31,72,400	2020-2023	Ongoing

## 7. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr. Atanu Singha Roy	Head of the Department, Chemistry/DRC Chairman	April-June 2021
2	Dr. Atanu Singha Roy	Chief Warden	01/07/2021-till date
3	Dr. Atanu Singha Roy	Chairman, CIF NIT Meghalaya	15/02/2021-till date
4.	Dr. Naba Kamal Nath	Member, Institute ethics committee	15/10/2020- till date
5.	Dr. Naba Kamal Nath	Member, Purchase committee, Department of Chemistry	22/12/2020- till date
6.	Dr. Naba Kamal Nath	Member, departmental screening committee for screening of applications with regard to the post of technical assistant, technician and la-boratory assistant	
7	Dr. Naba Kamal Nath	Member, Institute's intellectual property committee	3/12/2020-till date
8.	Dr. Naba Kamal Nath	Patron, team to work for drug addiction eradication campaign	12/09/2019-till date
9.	Dr. Naba Kamal Nath	External Member, Department re-search committee, Physics	2/12/2020-till date
10	Dr. Naba Kamal Nath	Member, Department research committee, Humanities and social science	2/12/2020-till date
11	Dr. Atanu Singha Roy	Member, Medical & Covid Response Committee	01/07/2021-till date
12	Dr. Atanu Singha Roy	Convener, Best Thesis Award & Best Project Award Committee	01/03/2021-till date
13	Dr. Paresh Nath Chatterjee	Faculty Advisor of MSc 2021 batch	AY 2021-22 to till date
14	Dr. Paresh Nath Chatterjee	Member of BWC and Board of Governors	20/09/2021-till date
15	Dr. Paresh Nath Chatterjee	Member of PGPEC	11/08/2021-till date
16	Dr. Paresh Nath Chatterjee	Chairman DFAC	02/09/2021-till date
17	Dr. Paresh Nath Chatterjee	Member IFAC	17/09/2021-till date
18	Dr. Paresh Nath Chatterjee	Member of extended ACoFAR	02/09/2021-till date
19	Dr. Paresh Nath Chatterjee	Member of CCD	04/03/2022- till date
20	Dr. Gitish Kishor Dutta	Dean R & C	1/7/2020 till date
21	Dr. Gitish K. Dutta	Member Secretary, Institute's intellectual property committee	3/12/2020-till date
22	Dr. Gitish K. Dutta	Member Secretary, Institute Ethics Committee	15/10/2020
23	Dr. Amit K. Paul	President, SAC	01/07/2021-till date
24	Dr. Amit K. Paul	Warden, Lapalang -2	01/04/2021 - 30/06/2021
25	Dr. Amit K. Paul	Chairman, On Campus Business Committee	01/04/2021 - 30/06/2021
26	Dr. Amit K. Paul	Member, NSS Committee	01/04/2021 - till date
27	Dr. Amit K. Paul	Faculty Advisor, M.Sc. CY 2020 batch	01/04/2021 - till date
28	Dr. Amit K. Paul	Member, Library Committee	01/04/2021 - till date

## 8. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. Gitish K. Dutta	Life time member of CRSI and Indian Society for ElectroAnalytical Chemistry (ISEAC)

## 9. Any Other Notable Information:

### A. Achievements, awards and recognition of the student and staff

### Faculty Members

Sl. No.	Faculty Name	Role/Technical Assistance	Journal Name/Conference
1	Dr. Atanu Singha Roy	Reviewer	Journal of Molecular Liquids, Food Chemistry, ACS Omega, Luminescence, Journal of Molecular Structure, ACS Food Science & Technology, Food & Function, Journal of Nanostructure in Chemistry, Chemical Data Collections, Journal of Food Biochemistry, Spectrochimica Acta A, Encyclopedia of Analytical Chemistry.
2		Reviewer	Chemistry Select, Applied Nanoscience, Journal of Electroanalytical Chemistry

### B. Ph.D. Students (Best Poster/Paper Awards)

### Conference / Symposium / Workshop attended by the Ph.D. Students

Name of the student	Name of the conference/ symposium/workshop	Organizer(s)	Duration	Title of poster/oral presentation
Mahabul Haque	1. 12th National Workshop on Fluorescence and Raman Spectroscopy (FCS 2021)	IISER ThiruvananthaPuram	29th November –4th December, 2021, Kerala, India	Water-soluble Cadmium selenide quantum dots for detection of antibiotic lomefloxacin and also studies of interaction properties with the protein human serum albumin
	2. 3rd Research Conclave 2022	NIT Meghalaya	29th February –1st March, 2022, Shillong, Meghalaya, India	Green Tea Extract Mediated Synthesis of Cadmium Sulphide Quantum Dots: Interaction with carrier Protein Human Serum Albumin, Biosensing and Antibacterial Applications

### C. GATE /NET 2022 Results

Sl. No.	Name of the student	GATE Rank (AIR)	NET
1	Mitul Kalita	2213	Lectureship
2	Basudha Deb	2673	NA

# Department of Humanities and Social Sciences

## 1. Brief Introduction to the Department:

The main aim of the department is the holistic and all-round development of the technical graduates into socially responsible individuals by providing allied knowledge essential to engineering students. The department is

equipped with a modern Computer Assisted Language Learning Laboratory.

## 2. Programmes Offered:

- Ph.D. Programme

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining and Leaving	Ph.D. Guidance
Dr. P. S. Mangang	Associate Professor	Ph.D.	cEnglish	01.06.2012	2 completed, 5 Ongoing
Dr. Sunidro LS Akoijam	Visiting Faculty [Spring Semester 2022]	Ph.D.	Management	14.12.2021	

## 4. Administrative Responsibilities Held or Membership of Committees:

Name	Role	Duration
P. S. Mangang	Head of Department	Whole Year
	Chairman, Departmental Research Committee	Whole Year
	Chairman, Departmental Academic Committee	Whole Year
	Faculty-in-charge, Language Lab	Whole Year
	Member, Academic Programmes Committee	Whole Year
	Member, UG-PEC (Programme Evaluation Committee)	Whole Year
	Member, PG-PEC (Programme Evaluation Committee)	Whole Year
	Member, IQAC	Whole Year
	Member, Library Committee	Whole Year
	Member, Routine Committee	Whole Year
	Member, Non-Faculty Selection Committee 2021-22	2021-2022
	Chief Editor of NITM Chronicle	Whole Year

## 5. Membership of Professional Bodies:

Name of Faculty	Member of
P. S. Mangang	English Literary Circle Manipur
	English Language Teachers' Association of India
	English Language Teachers' Association of India, Meghalaya Chapter

## 6. Outreach Activities:

Name	Activities
P. S. Mangang	Member, Board of Studies, Department of English, Manipur University of Culture, Imphal
	Chairman of Doctoral Committee (DC) for 2 Research Scholars at NIT Mizoram
	External Member of Research Advisory Committee (RAC) for a Research Scholar of Tripura University
	Question paper setter for College of Horticulture and Forestry, Central Ag-ricultural University, Arunachal Pradesh
	Examiner, MA English, NEHU
	Examiner, Ph.D. Thesis, EFLU
	Reviewer for <i>Communication and the Public</i> (Sage Journal)

## 7. Projects:

Title of the Project	Investigator	Funding Agency	Funding Amount (Rs)	Duration	Status
Mobile Assisted English Language Teaching: Developing an Effective Teaching Method for B.Tech. Students of NIT Meghalaya	P. S. Mangang	TEQIP III	1,80,075/-	2 years	Completed

## 8. Ph.D. Scholars' Profile:

Name	Specialization	Supervisor	Remarks
Mr. Amal Dev Sarma	Management	Dr. B. Roychoudhury (IIM Shillong)	Advanced Stage
Ms. B. Samita Devi	Literature	Dr. P. S. Mangang	Completed
Mr. Rangehbok Lyngwa	Literature		Completed
Ms. Arundhati Ashangbam	Literature		Advanced Stage
Ms. Ankita Bhowmick	Literature		Registration Completed
Ms. Amanda Basaiawmoit	Literature		Registration Completed
Ms. Santidora Nongpluh	Cultural Studies		Undergoing Course Work
Ms Bibiana Ryntathiang	Literature		Undergoing Course Work

## 9. List of Publications in Journals:

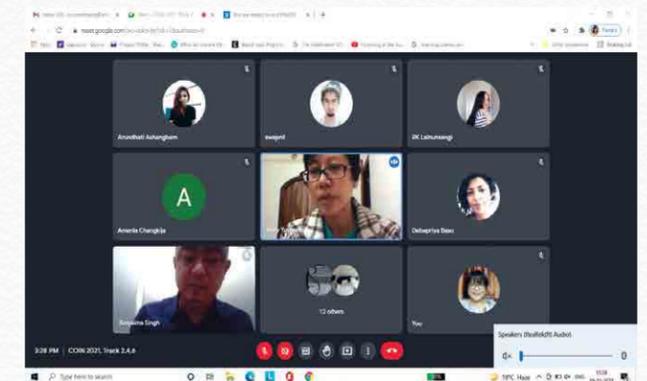
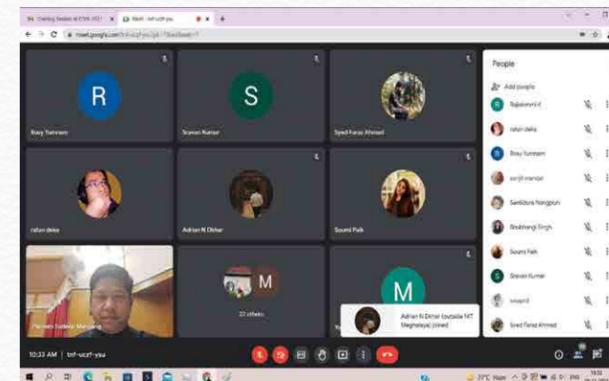
1. A. Ashangbam & P. S. Mangang, 'Logotherapy and Primo Levi: A Rereading of *If This is a Man*', *Literary Voice: A Peer Reviewed Journal of English Studies*. Number 17, Vol. 1, March 2022.

## 10. List of Presentations in Conferences:

1. A. Ashangbam & P. S. Mangang, 'Normalizing Dehumanization : A Critical Discourse on Jewish Men through Primo Levi's Testimonies', at the 3<sup>rd</sup> Annual Research Conclave, organised by NIT Meghalaya, 28<sup>th</sup> February & 1<sup>st</sup> March 2022.
2. A. Bhowmick & P. S. Mangang, 'Women as a Site of Resistance in Toni Morrison's *The Bluest Eye* and *Sula*', at the 3<sup>rd</sup> Annual Research Conclave, organised by NIT Meghalaya, 28<sup>th</sup> February & 1<sup>st</sup> March 2022.
3. A. Bhowmick & P. S. Mangang, 'Lessons learned through #MeToo through Toni Morrison's *Beloved*', at the 3<sup>rd</sup> Annual Research Conclave, organised by NIT Meghalaya, 28<sup>th</sup> February & 1<sup>st</sup> March 2022. (Poster)
4. A. Basaiawmoit, P. S. Mangang, 'Uncertain Identities: A Study of Select North-East Poets', at the 2nd Pan NIT HSS International Conference on Resilience and Transformation for Global Restructuring (ICRTGR 2022), organised by MNIT Jaipur, 7<sup>th</sup> to 9<sup>th</sup> January 2022.
5. P. S. Mangang, Commencement Talk – 'Digitizing and Translating North East Literature', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
6. A. Basaiawmoit, P. S. Mangang, 'Telling Her Story: A Study of Select North East Poets', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
7. A. Ashangbam, P. S. Mangang, 'Aesthetic Significance of the Manipuri Folk Epic 'Khamba Thoibi Seireng'', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
8. A. Bhowmick & P. S. Mangang 'Violence: A Recurrent Motif in the Literary Works of North East India', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
9. B. Rynthiang, 'The Boon of Social Media for Independent Comics in Meghalaya', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
10. S. Nongpluh, 'The Tragedy of Love: An Analysis of Gender Roles in 'Ka Jingiam Ka Riti' by Kynpham Sing Nongkynrih', at the Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), organised by NIT Meghalaya, 19<sup>th</sup> & 20<sup>th</sup> November 2021.
11. A. Ashangbam, P. S. Mangang, 'Reestablishing Jewish Identity through testimony: An Analysis through Primo Levi's *If This Is a Man*', at the National Conference on Contemporary Perspectives in English Language Literature and Cultural Studies (NCCPE-2021), University Institute of Liberal Arts and Humanities, Chandigarh University, 11<sup>th</sup> & 12<sup>th</sup> June 2021.
12. A. Bhowmick & P. S. Mangang 'Trauma and Memory: Female Slaves in Toni Morrison's *Beloved*', at the National Conference on Contemporary Perspectives in English Language Literature and Cultural Studies (NCCPE-2021), organised by University Institute of Liberal Arts and Humanities, Chandigarh University, 11<sup>th</sup> & 12<sup>th</sup> June 2021.
13. A. Bhowmick & P. S. Mangang, 'Black Motherhood in Toni Morrison's *Beloved*', at the International Conference on "Gender Studies and Women Empowerment", organised by NIT Agartala, 16<sup>th</sup> to 18<sup>th</sup> April 2021.
14. A. Ashangbam & P. S. Mangang, 'Violence as a Tool for Dehumanization of Jewish Men: A Study of Primo Levi's Depiction of Nazi Propaganda and its Consequences', at the 3-Day Online National Symposium on Reading And Interpreting Literature, organised by English Department, Highland National College, Tispari, Kanglatongbi, Manipur and supported by Spectrum: An International Journal of Humanities and Social Sciences (ISSN: 2319-6076), 8<sup>th</sup> to 10<sup>th</sup> April 2021.
15. A. Bhowmick & P. S. Mangang, 'Quest for Identity in Toni Morrison's *The Bluest Eye*', at the 3-Day Online National Symposium on Reading And Interpreting Literature, organised by English Department, Highland National College, Tispari, Kanglatongbi, Manipur and supported by Spectrum: An International Journal of Humanities and Social Sciences (ISSN: 2319-6076), 8<sup>th</sup> to 10<sup>th</sup> April 2021.

## 11. Workshops / Conferences Organised:

1. Two-day Online National Conference on Literature, Language, and Culture of North East India (COIN-2021), 19<sup>th</sup> & 20<sup>th</sup> November 2021. COIN-2021 was organized in collaboration with the Department of English Language Teaching, EFLU, Shillong Campus, and Spectrum: An International Journal of Humanities and Social Sciences.
2. 2nd Pan NIT HSS International Conference on Resilience and Transformation for Global Restructuring (ICRTGR 2022), NIT MNIT Jaipur, 7<sup>th</sup> to 9<sup>th</sup> January 2022. (Collaborated with MNIT Jaipur)



## 12. Resource Persons /External Speakers Invited:

1. Prof. T. K. Bamon, Vice-Chancellor, Martin Luther Christian University, Shillong and Former Professor, EFLU, Shillong Campus
2. Prof. Jyotirmoy Prodhani, Professor and Head, Department of English, NEHU, Mawlai
3. Dr. Mousumi Guha Banerjee, Associate Professor and Head, Department of English Literature, EFLU, Shillong Campus
4. Dr. Suranjana Choudhury, Assistant Professor, Department of English, NEHU
5. Dr. Rosy Yumnam, Assistant Professor, Department of English Language Education, EFLU, Shillong Campus
6. Dr. Rangehbok Lyngwa, Senior Lecturer, Shillong Polytechnic, Mawlai
7. Dr. Khelsoril Wanbe, Assistant Professor, Department of English, Highland National College, Kanglatongbi, Manipur
8. Ms. Bijoya Sawian, Noted Writer and Translator
9. Dr. Khomdram Guneshwor Singh, Faculty, Department of Dance and Music, Manipur University
10. Dr. Ksh. Premchandra Singh, Assistant Professor, Department of English, Tripura University
11. Dr. Sunildro LS Akoijam, Assistant Professor, Department of Management, NEHU, Tura Campus

## 13. Awards / Achievements:

1. Ms. Arundhati Ashangbam (P17HS001) received the Award for the Best Presenter at the 3-Day Online National Symposium on Reading and Interpreting Literature, organised by English Department, Highland National College, Tispari, Kanglatongbi, Manipur, 8th to 10th April 2021.
2. Ms. Ankita Bhowmick (P19HS001) received the Best Presentation Award at the International Conference on "Gender Studies and Women Empowerment", organised by NIT Agartala, 16th to 18th April 2021.

# Department of Mathematics

## 1. Brief Introduction to the Department:

The Department of Mathematics was established in 2012 with the inception of National Institute of Technology Meghalaya. The department offers Ph.D. and 2 year-M.Sc. programmes in Mathematics. The department also supports all the engineering departments by offering undergraduate and postgraduate level courses in Mathematics to the B. Tech., M. Tech. and Ph.D. students over a number of semesters. The department has been organizing seminars and summer internship programs for students and research scholars. The department has at present six regular faculty members and one adjunct professor. The faculties are actively engaged

in research, teaching, training and administrative works. The main objective of the department is to attract the students of science and engineering, and to provide them academically coherent programmes, with courses that range from the fundamental to the advanced. The department has a FIST sponsored mathematics laboratory with computers, workstation equipped with software such as MATLAB, MATHEMATICA, etc. to facilitate faculty, students for their research and laboratory-oriented courses.

## 2. Programmes Offered:

- 2-year M. Sc. programme
- Ph. D. programme

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Dr. Saikat Mukherjee	Assoc. Professor	Ph.D.	Functional Analysis	25-07-2013	01 completed and 03 ongoing	
Dr. Tikaram Subedi	Asst. Professor	Ph.D.	Abstract Algebra	01-06-2012	1 completed and 01 ongoing	
Dr. Manideepa Saha	Asst. Professor	Ph.D.	Linear Algebra	22-07-2013	04 ongoing	01 as Co-supervisor
Dr. Bidasagar Kumbhakar	Asst. Professor	Ph.D.	Fluid Dynamics	20-07-2015	01 submitted and 02 ongoing	01 as main supervisor
Dr. Adarsha K. Jena	Asst. Professor	Ph.D.	Statistics	01-10-2019	--	
Dr. Timir Karmakar	Asst. Professor	Ph.D.	Fluid Dynamics	27-01-2020	--	

## 4. List of Publications:

### a. Journals:

1. **Timir Karmakar**, Meraj Alam and G. P. Raja Sekhar. Analysis of Brinkman-Forchheimer extended Darcy's model in a fluid saturated anisotropic porous channel, *Communications on Pure and Applied Analysis* (American Institute of Mathematical Sciences), **21**(3), 845, 2022.
2. Osamu Sano, **Timir Karmakar** and G. P. Raja Sekhar. Viscous flow around 3D macroscopic cavities in a granular material, *Journal of Fluid Mechanics* (Cambridge University Press), **931**(A20).
3. **Timir Karmakar** (2021). Physics of unsteady Couette flow in an anisotropic porous medium, *Journal of Engineering Mathematics* (Springer), **130**, 1-26, 2022.
4. Nirupam Ghosh, **Timir Karmakar** and G. P. Raja Sekhar. Application of conformal mapping to two-dimensional flows in an anisotropic aquifer, *Indian Journal of Pure and Applied Mathematics* (Springer), 1-10, 2021.
5. **B. Kumbhakar**, S. Nandi and G. S. Seth, Aspects of second-order velocity slip and radiation absorption on hydromagnetic stagnation point flow of Jeffrey fluid with chemical reaction, *Heat Transfer*, DOI: 10.1002/htj.22503, 2022.
6. .M. Das and **B. Kumbhakar**, Hall and ion slip effects on MHD bio-convective Eyring-Powell nanofluid flow past a slippery sheet under porous medium considering Joule heating and activation energy, *Journal of Porous Media*, DOI: <https://doi.org/10.1615/JPorMedia.2022042149>, 2022.
7. S. Nandi, **B. Kumbhakar** and G. S. Seth, Quadratic regression analysis of unsteady MHD free convective and radiative-dissipative stagnation flow of hybrid nanofluid over an exponentially stretching surface under porous medium, *Chinese Journal of Physics*, Vol.-77, pp. 2090-2105, 2022.
8. M. Das, S. Nandi and **B. Kumbhakar**, Hall effect on unsteady MHD 3D Carreau nanofluid flow past a stretching sheet with Navier's slip and nonlinear thermal radiation, *Palestine Journal of Mathematics*, Vol. 11(Special Issue I), pp. 95-108, 2022.
9. **B. Kumbhakar** and S. Nandi, Unsteady MHD radiative-dissipative flow of Cu-Al<sub>2</sub>O<sub>3</sub>/H<sub>2</sub>O hybrid nanofluid past a stretching sheet with slip and convective conditions: A regression analysis, *Mathematics and Computers in Simulation*, Vol.-194, pp. 563-587, 2022.
10. M. Das, **B. Kumbhakar** and J. Singh, Analysis of unsteady MHD Williamson nanofluid flow past a stretching sheet with nonlinear mixed convection, thermal radiation and velocity slips, *Journal of Computational Analysis and Applications*, Vol.- 30, No-1, pp. 176-195, 2022.
11. S. Nandi and **B. Kumbhakar** and S. Sarkar, MHD stagnation point flow of Fe<sub>3</sub>O<sub>4</sub>/Cu/Ag-CH<sub>3</sub>OH nanofluid along a convectively heated stretching sheet with partial slip and activation energy: numerical and statistical approach, *Int. Commun. Heat Mass Transf.*, Article ID: 105791, DOI: 10.1016/j.icheatmasstransfer.2021.105791, 2022.
12. S. Nandi, M. Das and **B. Kumbhakar**, Entropy generation in magneto-Casson nanofluid flow along an inclined stretching sheet under porous medium with activation energy and variable heat source/sink, *Journal of Nanofluids*, Vol.- 11, pp. 17-30, 2022.
13. S. Nandi and **B. Kumbhakar**, Entropy generation in radiative MHD nanofluid flow past an inclined stretched surface with multiple slips in the presence of Arrhenius activation energy, *Physica Scripta*, Vol.- 96, Article ID: 125225, DOI: 10.1088/1402-4896/ac2b47, 2021.
14. S. Nandi and **B. Kumbhakar**, Entropy generation in MHD nanofluid flow induced by a slendering stretching sheet with activation energy, viscous dissipation and Joule heating impacts, *Indian Journal of Physics*, DOI: 10.1007/s12648-021-02206-x, 2021.
15. M. Das, S. Nandi, **B. Kumbhakar** and G.S. Seth, Soret and Dufour Effects on MHD Nonlinear Convective Flow of Tangent Hyperbolic Nanofluid Over a Bidirectional Stretching Sheet with Multiple Slips, *Journal of Nanofluids*, Vol.-10(2), pp. 200-213, 2021.
16. T. Siva, S. Jangili and **B. Kumbhakar**, Heat Transfer Analysis of Rotating MHD and Electroosmotic flow of Non-Newtonian Fluid through a Microfluidic channel: An Exact Solution, *Applied Mathematics and Mechanics*, Vol-42, pp. 1047-1062, 2021.
17. S. Nandi and **B. Kumbhakar**, Viscous Dissipation and Chemical Reaction Effects on Tangent Hyperbolic Nanofluid Flow Past a Stretching Wedge with Convective Heating and Navier's Slip Conditions, *Iran. J. Sci. Technol. Trans. Mech. Eng.*, DOI:10.1007/s40997-021-00437-1, 2021.
18. Sanjiv Subba and **Tikaram Subedi**, NJ-semicommutative rings, *Miscalc Mathematical Notes*, 2022, (Accepted for publication).

19. A. Bhandari, **S. Mukherjee**, On Wovenness of K-Fusion Frames, *Mathematical Methods for Engineering Applications*. ICMASE 2021. Springer Proceedings in Mathematics & Statistics, vol 384, 93-101, 2022, Springer, Cham. doi: 10.1007/978-3-030-96401-6\_8
20. **M. Saha**, On Some Generalized inverses of M\_v-matrices, *Operator and Matrices*, Vol. 15 (2021), 1227-1240
21. J. Chakravarty, A. Athikho and **M. Saha**, Convergence of Internal AOR Method for Linear Interval Equations, *Numerical Algebra, Control and Optimization*, Vol. 12, No. 2 (2022), 293-308

## 5. Conferences / Workshops / Seminars / Trainings Attended by Faculty Members:

Sl. No.	Name of Faculty	Name of the programme attended	Duration
1	Dr. Saikat Mukherjee	International Conference on Mathematics and Its Applications in Science and Engi-neering (ICMASE 2021), Universidad de Salamanca, Spain.	1-2nd July, 2021
2	Dr. Bidyasagar Kumbhakar	AICTE sponsored Five Days online FDP on "Examination Reforms" organized by Department of Mathematics, NIT, Agarta-la	24th – 28th Jan-uary 2022

## 6. Invited Talks Delivered:

1. **T. Karmakar**: Delivered an invited talk on "Modelling Mechanics of Lifting Large Object from a Seabed" in **14th Siksha 'O' Anusandhan Weekly Academic Lecture** organized by the Centre for Applied Mathematics & Computing, **ITER**, Sikhsha 'O' Anusandhan University, Bhubaneswar, India on October 30, 2021.
2. **B. Kumbhakar**: Delivered an invited talk on "Numerical Solution of Two-Point Boundary Value Problems: Shooting Method" in **AICTE-QIP** sponsored online short-term course on **Implementation of Numerical Methods using MATLAB** organized by Department of Mathematics, IIT Indore during January 03-08, 2022.
3. **M. Saha**: Delivered an invited talk on "A Few Important Classes of Matrices and their Applications" in "Recent Advancement in Mathematics and Statistics" organized by the Department of Mathematics & Statistics, Sankardev College Shillong on November 06, 2021
4. **M. Saha**: Two lectures were delivered on AICTE-sponsored Short Term Training Program on "Numerical Linear Algebra and Optimization Techniques in Engineering" during March 15-19, 2022 conducted by Department of Mathematics, NIT Meghalaya.
5. **S. Mukherjee**: Two lectures were delivered on AICTE-sponsored Short Term Training Program on "Numerical Linear Algebra and Optimization Techniques in Engineering" during March 15-19, 2022 conducted by Department of Mathematics, NIT Meghalaya.

## 7. Projects

### a. Sponsored Project

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount (Rs)	Duration	Status
1	K-Fusion Frames- Applications to Sensor Network and Coding Theory	Dr. Saikat Mukherjee	DST-SERB	6,60,000	3 Years	Completed
2	Iterative methods for solving non-square linear systems	Dr. Manideepa Saha	DST-SERB	17,05,200	3 Years	Ongoing
3	On LU-factorization of Generalized M-matrices	Dr. Manideepa Saha	DAE-NBHM	14,33,600	3 Years	Completed
4	A study on interval methods of system of interval linear equations	Dr. Manideepa Saha	TEQIP, NIT Meghalaya	1,52,250	2 Years	Completed
5	Analysis of MHD Flow of Jeffrey Fluid past a Stretching sheet: A Numerical Simulation	Dr. Bidyasa-gar Kumbhakar	TEQIP, NIT Me-ghalaya	1,65,000	2 Years	Completed
6	Modeling of endothelial glycocalyx (EGL) and transport of low-density lipoprotein (LDL) in artery: anisotropic porous medium approach	Dr. Timir Karmakar	SERB-DST	13,73,372	2 Years	Ongoing
7	Estimating Coefficient of Variation or its Reciprocal under some Censoring Schemes	Dr. Adarsha Kumar Jena	TEQIP, NIT Meghalaya	1,43,000/-	2 Years	Completed

## 8. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Dr. Saikat Mukherjee	Chief Warden Chairman, Medical & Covid Response Committee	Till June 30, 2021 01.07.2021-Till date
2	Dr. Manideepa Saha	Professor in Charge, Center of International Relations	Full year
3	Dr. Bidyasagar Kumbhakar	Head, Department of Mathematics	Full year
4	Dr. Adarsha Kumar Jena	Warden, NEEPCO Boys Hostel	25.03.2022-Till date

## 9. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. Saikat Mukherjee	<ul style="list-style-type: none"> <li>Society for Industrial and Applied Mathematics (SIAM),</li> <li>American Mathematical Society (AMS),</li> <li>Indian Mathematical Society (IMS).</li> </ul>
2	Dr. Manideepa Saha	<ul style="list-style-type: none"> <li>Society for Industrial and Applied Mathematics (SIAM),</li> <li>SIAM Activity Group on Linear Algebra,</li> <li>American Mathematical Society (AMS),</li> <li>Indian Mathematical Society (IMS).</li> </ul>
3	Dr. Bidyasagar Kumbhakar	<ul style="list-style-type: none"> <li>Indian Society of Theoretical and Applied Mechanics (ISTAM)</li> <li>Society of Applied Mathematics, IIT(ISM) Dhanbad</li> </ul>

Sl. No.	Name of Faculty	Member of
4	Dr. Timir Karmakar	<ul style="list-style-type: none"> <li>Indian Society of Theoretical and Applied Mechanics (ISTAM)</li> <li>Indian Mathematical Society (IMS)</li> </ul>
5	Dr. Adarsha Kumar Jena	<ul style="list-style-type: none"> <li>International Indian Statistical Association (IISA)</li> <li>Indian Mathematical Society (IMS)</li> </ul>

## 10. List of Achievements and Activities during the Year 2021-22:

- T. Karmakar:** Chaired a session in “66th Congress of the Indian Society of Theoretical and Applied Mechanics (ISTAM)” organized by ISTAM and VIT-AP University, Amaravati.
- S. Mukherjee:** Acted as a Chairperson in “2nd International Conference on Mathematical Modeling and Simulation in Physical Sciences (MMSPS-2022)” organized by Department of Mathematics, SVNIT.
- B. Kumbhakar:** Reviewed 15 journal papers during the year.
- Research Scholars of the department have published 17 research articles, presented 5 posters, attended 11 workshops and 07 conference/seminars/webinars.

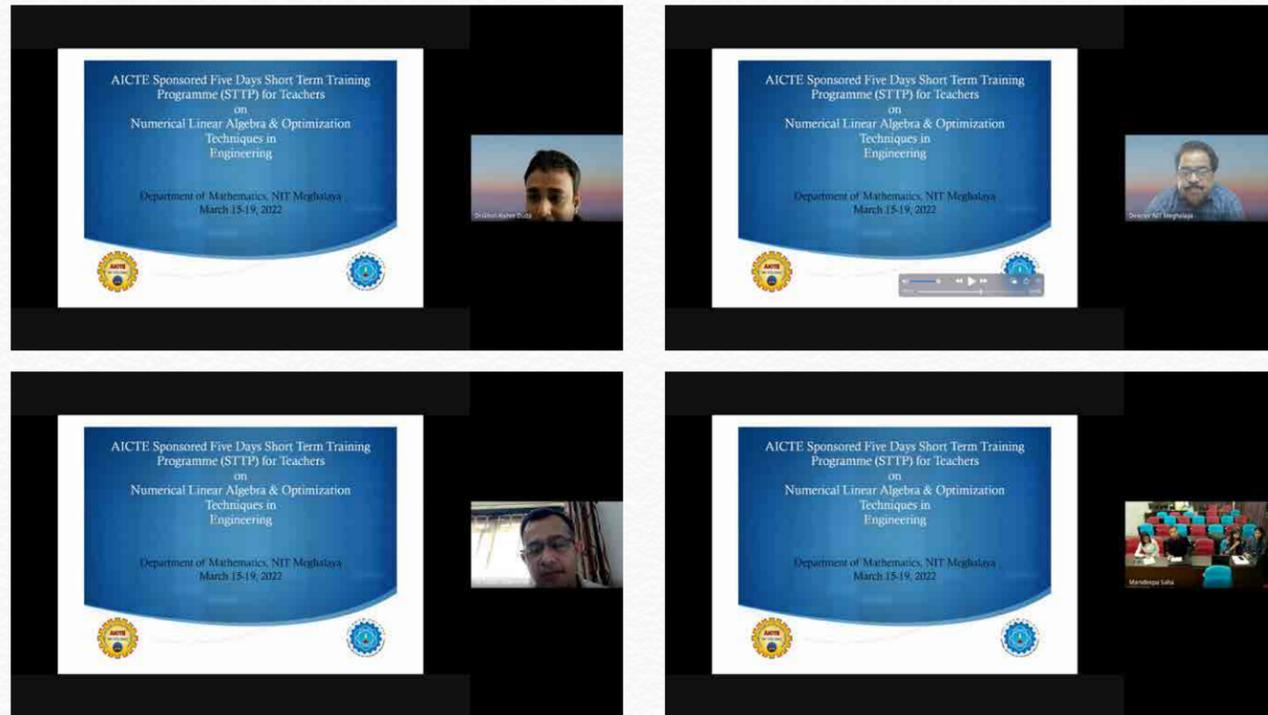
## 11. Any Other Notable Information:

- The department has organized 5-days online AICTE sponsored Short Term Training Program on “Numerical Linear Algebra and Optimization Techniques in Engineering” under the coordination of Dr. M. Saha and Dr. S. Mukherjee during March 15-19, 2022.
- Research Scholar **Mr. Susmay Nandi** received the institute best researcher award in the “3rd Research Conclave 2022” organized by NIT Meghalaya.
- Research Scholar **Mr. Manik Das** received the best paper award in “1st International Conference on Mathematics and Computation” organized by Rajkiya Engineering College Kannauj (REC Kannauj) during October 22-23, 2021.

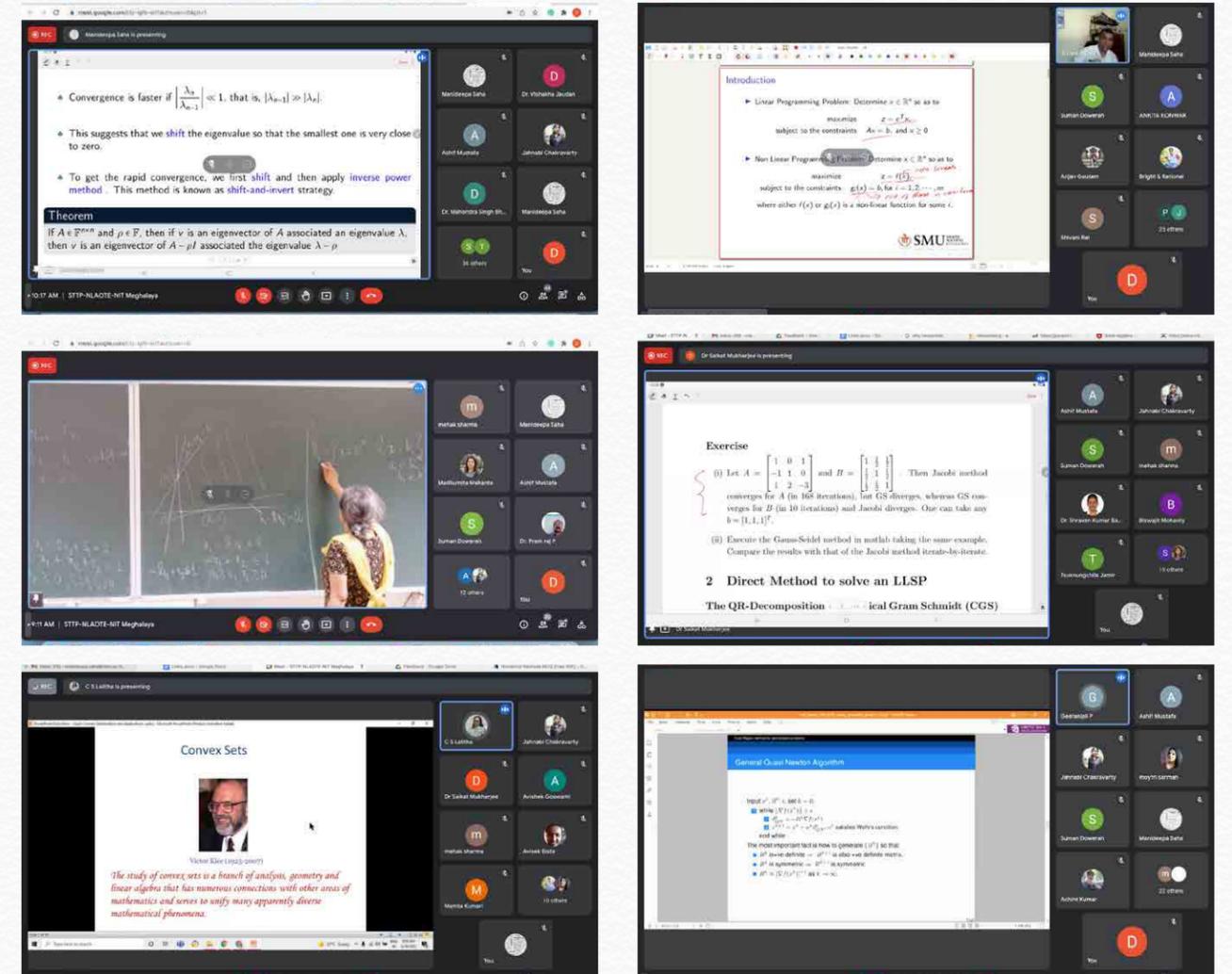
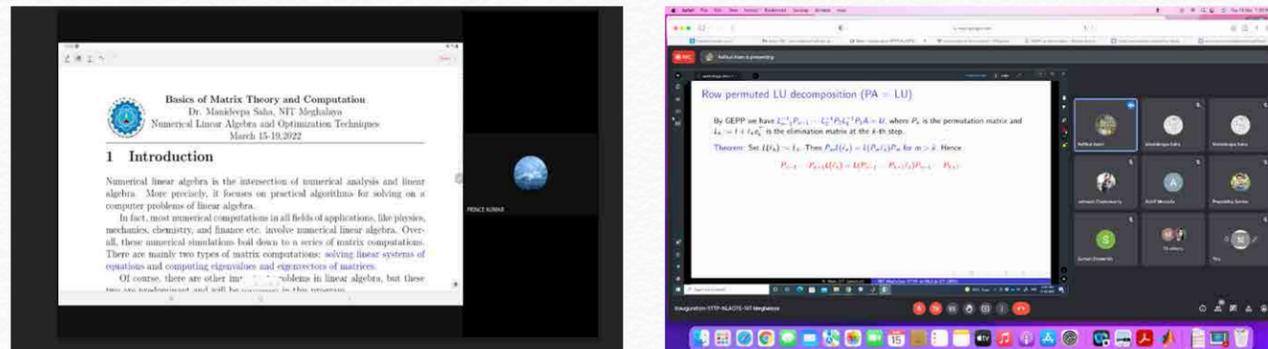
## 12. Department activities in Photographs:

- Photographs of 5-days online AICTE sponsored Short Term Training Program on “Numerical Linear Algebra and Optimization Techniques in Engineering” during March 15-19, 2022.

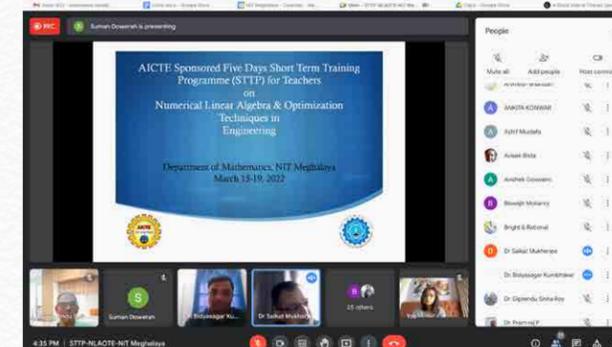
### (A) Inaugural Session



### (B) Lecture Sessions



### (C) Valedictory Session



# Department of Physics

## 1. Brief Introduction to the Department:

The Department of Physics with its induction has evolved by offering two years full time Master of Science programme. The department has also progressed in furnishing the Doctor of Philosophy programme and so far the degree has been awarded to 2 nos. of aspirants. In addition, the department supports the engineering branches of the institute by floating the foundation courses for B.Tech (1st year) and advanced science electives for B.Tech (2nd Year onwards) students. The department is well equipped with experimental laboratories

which make corroboration with classroom physics for both undergraduate and post graduate level. The functionality and progressiveness of the department is accredited to young, dynamic and potential faculty pool with necessary support from the staff.

## 2. Programmes Offered:

- Master of Science (Physics)
- Doctor of Philosophy (Physics)

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Prof. Ayon Bhattacharjee	Professor	PhD	Experimental Condensed Matter Physics	24 July 2013	3 ongoing, 1 submitted thesis, 9 awarded	
Dr. Arpita Nath	Assistant Professor	PhD	Laser Matter Interaction	03 October 2013	2 Ongoing	
Dr. K. Senthilkumar	Assistant Professor	PhD	Condensed Matter Physics	14 July 2015	2 Ongoing	
Dr. Tribedi Bora	Assistant Professor	PhD	Experimental Condensed Matter Physics	06 July 2015	2 Ongoing	
Dr. W. L. Reenbohn	Assistant Professor	PhD	Nonequilibrium Statistical Mechanics	02 November 2015	3 Ongoing	
Dr. Alekha. C. Nayak	Assistant Professor	PhD	Particle Physics, Astroparticle Physics	16 October 2019	2 Ongoing	

## 4. List of Publications:

### a. Journals

1. S. Mazumder and K. Senthilkumar, Device study and optimization of CZTS/ZnS based solar cell with CuI hole transport layer for different conduction band offset, *Solar Energy*, 237, 414-431, 2022.
2. E. Ahmed and K. Senthilkumar, First-Principle Investigation of Defect Associated LVM and Structural Parameter Dependency in Response 1 to the Ground State On-Site Hubbard Correction of w-ZnO, *Journal Raman Spectroscopy*, 2022, doi: 10.1002/jrs.6338
3. E. Ahmed, S. Mazumder, and K. Senthilkumar, Unintentional Hydrogen Doped Impurity Induced Complex Paramagnetic Centers in ZnO Nanoparticles, *Solid State Communications*, 339, 114501, 2021
4. E. Ahmed and K. Senthilkumar, VZn–Hcomplex defect induced ferromagnetic behavior of unintentional hydrogen doped ZnO nanoparticles, *Materials Science in Semiconductor Processing*, 123, 105593, 2021
5. Very special relativity induced phase in neutrino oscillation, Alekha C. Nayak. *Int.J.Mod.Phys.A* 36 (2021) 13, 2150079
6. Constraining Spinning Primordial Black Holes With Global 21 cm Signal, Pravin Kumar Natwariya, Alekha C. Nayak, and Tripurari Srivastava, *Mon.Not.Roy.Astron.Soc.* 510 (2021) 4236
7. Bounds on sterile neutrino lifetime and mixing angle with active neutrinos by global 21 cm signal, Pravin Kumar Natwariya and Alekha C. Nayak, *Phys.Lett.B* 827 (2022) 136955
8. Effect of Al<sup>3+</sup> Substitution on Structural, Magnetic and Dielectric Properties of Cobalt Ferrite Synthesis by Sol Gel Method and It's Correlation with Cationic Distribution, S. Sarmah, R. Bora, P. K. Maji, S. Ravi and Tribedi Bora, *Physica B: Physics of Condensed Matter* (Accepted on May 2022)
9. Thermotropic liquid crystals in the detection of albumins through a microscopic, spectroscopic and computational approach, P Kalita, RK Singh, A Bhattacharjee, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 265, 120374, 2022
10. Interactions investigated by the spectroscopic, microscopic and molecular docking studies for liquid crystal-based biosensor, P Kalita, RK Singh, A Bhattacharjee, *Liquid Crystals*, 1-15, 2021
11. Potential liquid crystal-based biosensor depending on the interaction between liquid crystals and proteins, P Kalita, SS Shukla, RK Singh, A Bhattacharjee, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 254, 119634, 2021
12. Investigation of a partially fluorinated chiral antiferroelectric liquid crystalline material with large negative dielectric anisotropy, D Gupta, P Kula, A Bhattacharjee, *Journal of Molecular Liquids* 331, 115704, 2021
13. Detailed analysis of a room temperature antiferroelectric liquid crystalline material forming polar mesophases, D Gupta, P Kula, A Bhattacharjee, *Journal of Molecular Liquids* 327, 114859, 2021
14. Computational, dielectric and electro-optical analysis of an orthoconic antiferroelectric mesogen having superstructure in its reduced symmetry phase, D Gupta, P Kula, A Bhattacharjee, *Ferroelectrics* 572 (1), 258-276
15. Interactions of a biological macromolecule with thermotropic liquid crystals: Applications of liquid crystals in biosensing platform, P Kalita, RK Singh, A Bhattacharjee, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 121347, 2022
16. Detection of human serum albumin by room temperature nematic liquid crystals based on polarising microscopy, molecular docking and Raman spectroscopy, P Kalita, A Bhattacharjee, *Liquid Crystals*, 1-13, 2022
17. Inquest of material dissipation from cavitation bubble in laser-irradiated solid–liquid interface, Amitjyoti Deka, Prahlad K Baruah, Alike Khare, Arpita Nath, *Radiation Effects and Defects in Solids*, <https://doi.org/10.1080/10420150.2021.2025057>, 2022
18. Investigation of the exuberant cavitation bubble and shock wave dynamics in pulsed laser ablation of copper in distilled water, Prahlad K Baruah, Arpita Nath, Ashwini K Sharma, Alike Khare, *Applied Physics A*, 128, 2022, 1.

## 6. Conferences / Workshops / Seminars / Trainings Attended (Faculty)

Sl. No.	Name of Faculty	Name of the programme attended	Duration
1	Dr. Alekha C. Nayak	Anomalies 2021 (Online)	November 10-12 2021
2	Dr. Alekha C. Nayak	One-day National Symposium on High Energy Physics	1st May 2021
3	Dr. Tribedi Bora	First International Conference on Material Sciences and Applied Physics (Online)	22nd- 24th Nov 2021
4	Dr. Tribedi Bora	Symposium on Magnetism and Spintronics (Online)	25th-27th Nov 2021

## 7. Conferences / Workshops / Seminars / Trainings Attended (Students)

Sl. No.	Name of Student	Name of the programme attended	Duration
1	Sikha Sarmah	Around the clock Around the Globe Magnetism Conference	24th August, 2021
2	Sikha Sarmah	First International Conference on Material Sciences and Applied Physics	22nd-24th November, 2021
3	Onnus Manner	Around the clock Around the Globe Magnetism Conference	24th August, 2021
4	Onnus Manner	Characterization Technique of Material and Devices	14th-15th March, 2022
5	Onnus Manner	First International Conference on Material Sciences and Applied Physics	22nd-24th November, 2021
6	Sanchia Mae Khar-panbuh	Virtual National Conference on "Plasma Science and Applications" (PSA - 2021)	20th-21st December, 2021
7	Sanchia Mae Khar-panbuh	Online training program/workshop on "Characterization Technique of Material and Devices"	14th - 15th March, 2022
8	Arindom Phukan	Virtual National Conference on "Plasma Science and Applications" (PSA - 2021)	20th-21st December, 2021
9	Santu Mazumder	Device modeling and study of AZO/i-ZnO/ZnS/CZTS-bilayer solar cell for different series and shunt resistances	October 21-23, 2021
10	Santu Mazumder	INUP-i2i Familiarization Workshop (20-22 December 2021) (Online)	20-22 December 2021
11	Santu Mazumder	Indian Nanoelectronics Users' Program-Idea to Innovation (INUP-i2i-2021) (Online)	12-14 December 2021
12	Santu Mazumder	Workshop on Software in Mathematics and Statistics (WSMS-2021) (Online)	02-06 August 2021
13	Santu Mazumder	Online Training – Cum Certificate Programme on Molecular Characterization Techniques	02-06 August 2021
14	Santu Mazumder	Training cum certificate Program on Basics and Application of X Ray Diffraction (Online)	01-21 June 2021

## 8. Invited Talks Delivered:

Dr. Alekha C. Nayak	Constraining Spinning Primordial Black Holes With Global 21 cm Signal in Anomalies 2021 at IIT H(online)
Prof Ayon Bhattacharjee	Basic idea of Spectroscopy: types and applications, Recent trends of Spectroscopy in material, nanomaterial and biological Sciences during 27-29 September 2021, Department of Physics, Manipur University. Spectroscopy of Soft matter and Biomolecules,, Recent trends of Spectroscopy in material, nanomaterial and biological Sciences during 27-29 September 2021, Department of Physics, Manipur University. An Introduction to Soft Matter with Special Emphasis on Liquid Crystals, Faculty Development Program on Novel Materials (sponsored by AICTE, New Delhi) NIT Mizoram, 04-08 October 2021 Characterization of Liquid Crystals and Biomolecules, Faculty Development Program on Novel Materials (sponsored by AICTE, New Delhi) NIT Mizoram, 04-08 October 2021 Resource person, and Main Speaker, St. Anthony's College, Shillong on National Science Day, 28/02.2022 Resource person, and Main Speaker, Shillong College, Shillong on One Day seminar on Nanotechnology, 17/12/2022
Dr. K. Senthilkumar	Faculty Development Program on Synthesis, characterization, and Applications of Novel Materials, held at RAMCO INSTITUTE OF TECHNOLOGY, Tamil Nadu. (02.08.2021 - 06.08.2021) Online Short Term Course on Smart Materials Processing and Application organized by Department of Physics, IIT Roorkee, and NIT Uttarakhand (November 15-19, 2021)

## 9. Projects:

### (a) Sponsored Projects:

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount	Duration	Status
1	Exploring High Density Magnetic Medium in Nanocrystal-line Spinel Ferrites for Magnetic Recording System	Dr. Tribedi Bora	DST-SERB	21,71,730/-	36 months	Ongoing
2	Fabrication of 2D Materials for Energy Harvesting Devices	Dr. K. Senthilkumar (Project Coordinator)	DST-FIST	160 Lakhs	5 years	Ongoing
3	Studies on Orthoconic Anti-ferroelectric liquid crystals	Prof. A Bhattacharjee	DST - SERB	20,02,08.00	3 years	Completed
4	Lab in a Shoebox	Prof. A Bhattacharjee	DIC	110000.00	1 year	Completed
5	A study SnO <sub>2</sub> nanoflakes doped liquid crystals	Prof. A Bhattacharjee	TEQIP Minor Project	195000.00	2 years	Completed
6	Bound on sterile neutrino decay width and mixing angle with active neutrino using global 21-cm absorption signal	Dr. Alekha C. Nayak	SERB- DST	11, 27, 522	2 years	Ongoing

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount	Duration	Status
7	Transport of a dimer in an inhomogeneous ratchet with spatially varying friction co-efficient	Dr. W. L. Reenbohn	DST - SERB	35,03,791	36 months	Ongoing
8.	Fluid Dynamical Aspects in nucleation of laser produced nanoparticles in liquids	Dr. Arpita Nath	DST-SERB-ECR	Rs 5166893/-	3 years	Completed
9.	Surface Waves from Electric Spark Generated Bubbles	Dr. Arpita Nath	TEQIP Minor Pro-ject	Rs 190000/-	2 years	Completed
10	Defect induced electron-phonon interaction in ZnO nanoparticles	Dr. K. Senthilkumar	UGC-DAE Consortium for Scientific Research	175000	3 years	Completed

## 10. Student Awards Won / Recognition received at the National and International level:

- a. Mr. Arindom Phukan (P18PH001) received Best Oral Presentation award in Virtual National Conference on Plasma Sciences and Applications (PSA - 2021) held by SVNIT, Surat on 20-21 December 2021.
- b. Ms. Priyanka Kalita (P17 PH002) received Best Poster award achieved in International Conference on " Frontiers in Terahertz Technology and Applications at CSIR-National Physical Laboratory, New Delhi, 9-11 December 2021

## 11. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1	Prof. Ayon Bhattacharjee	Dean (Faculty Welfare)	Ongoing
2	Dr. K. Senthilkumar	Chairman (Examination Cell)	Ongoing
3	Dr. Arpita Nath	HOD (Physics)	Ongoing
4	Dr. W.L. Reenbohn	Member, Routine Committee Member, UGPEC Member, Security Committee Member, Anti-Ragging and Students Disciplinary Committee Faculty Advisor	Ongoing
5	Dr. Tribedi Bora	Member, PGPEC Member, IQAC Member, Library Committee	Ongoing

## 12. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. K. Senthilkumar	1. Energy Science Society of India(ESSI) 0309201301L
2	Dr. Arpita Nath	1. Plasma Science and Society of India (PSSI) 2. Indian Society of Atomic and Molecular Physics (ISAMP)
3.	Dr Ayon Bhattacharjee	1. IEEE 2. Indian Liquid Crystal Society 3. International Liquid Crystal Society
4	Dr. Tribedi Bora	1. Life member of Magnetic Society of India 2. Life member of Physics Academy of North East

## 13. Any Other Notable Information:

Dr Alekha C. Nayak	Journal reviewed Proceedings of the Royal Society A
Dr. W. L. Reenbohn	External Examiner (NEHU)
Prof Ayon Bhattacharjee	External Examiner (NIT Nagaland) Thesis Examiner (Gauhati University) Member Senate, NIT Arunachal Pradesh Member Finance Committee, GKCIET, Malda
	Reviewer for: <ul style="list-style-type: none"> <li>Journal of Colloid and Interface Science</li> <li>Materials Today Proceedings</li> <li>Nano Select</li> <li>Journal of Crystal Growth</li> <li>Journal of Molecular Liquids</li> <li>Journal of Photochemistry &amp; Photobiology, B: Biology</li> <li>Inorganic and Nano-Metal Chemistry</li> <li>Arabian Journal of Chemistry</li> <li>Chemical Engineering Journal</li> <li>Materials Science and Engineering B</li> <li>Letters in Drug Design &amp; Discovery.</li> <li>Journal of Materials Science: Materials in Electronics</li> <li>Materials Science for Energy Technologies</li> </ul>
	Member, State Steering Committee for State Curriculum Framework
	Member, State Focus Group on Educational Technology
Arpita Nath	Journal reviewed: Applied Optics, Nanotechnology

# Centre for International Relations

## 1. Brief Introduction to the Center:

The Center for International Relations at NIT Meghalaya was established in 2017. The center is a comprehensive unit committed to developing, promoting and implementing international education initiatives for our students, faculty members and staffs. The center also takes care of admission of international students through various agencies like ICCR, Study-in-India, DASA etc. There are 25 international students currently studying undergraduate and postgraduate

program(s) in various departments of NIT Meghalaya, and 10 international students graduated from NIT Meghalaya

## 2. Courses Offered:

### Two Short Term Bridge courses under SII - UKIERI programme:

- Finishing college training program for engineers (6 weeks)
- Industrial Robotics & Mechatronics (4 weeks)

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization
Dr. Manideepa Saha	Faculty-in-Charge	Ph.D	Mathematics

## 4. List of Achievements and Activities during the Year 2021-22:

- 11 international students got admission at NIT Meghalaya in various program at NIT Meghalaya, among which six got through Study in India whereas five got through ICCR, during AY 2020-21.
- 9 international students graduated in 2021, among which 7 are completed BTECH program, and 2 completed MTECH program.

# Computer Centre

The Computer Centre continues to serve as the core of NIT Meghalaya. It provides support to departments and all sections in central facilities and technical services to all end-users. The academic activities, including the conduct of interviews, online tests and online admission for new students, and regular classes were possible using the internet facilities through Google Meet, Microsoft Teams etc provisioned by the computer centre. It also provides VPN connections for research scholars to work remotely from the home.

In July 2021 the Computer Center (CC), NIT Meghalaya purchased 90 licenses of the **Google Workspace for Education: Teaching and Learning upgrade** and distributed writing pads along with laptops to each faculty member, which adds enhanced educator tools to enriched communications and learning experiences and guides academic integrity.

This year the centre has installed a new **High-Performance Computing Cluster Solution (HPCC)** environment system with a combination of Windows cluster and Linux cluster servers with the below specifications:

## 3. Faculty Profile:

Sl. No.	Device Name	Description
1	HIGH PERFORMANCE COMPUTING CLUSTER SOLUTION (HPCC)	<p><b>Master Node</b> - 1Nos with 16 cores Intel processor @2.8GHz and 12MB cache, 128GB RAM, 800GB HDD</p> <p><b>Compute node (Without GPU)</b>- 1Nos with 150 cores Intel processor @2.2GHz and 38MB cache, 1152 GB RAM, 800GB HDD</p> <p><b>Compute Node (with GPU)</b> - 1Nos with 48 cores Intel processor @2.2GHz and 38MB cache, 384 GB RAM, 800GB HDD, 1x NVIDIA Ampere A100 80GB GPU Card.</p> <p>All are running the latest RHEL/Windows OS.</p>



**Network and Connectivity:** The centre manages the campus network and provides intra-campus connectivity through high-speed fibre links to all hostels over Shillong city.

The total bandwidth capacity of 1Gbps has been maintained by NKN (National Knowledge Network) through the underlying network of BSNL and a redundant link of 100 Mbps through Powergrid.

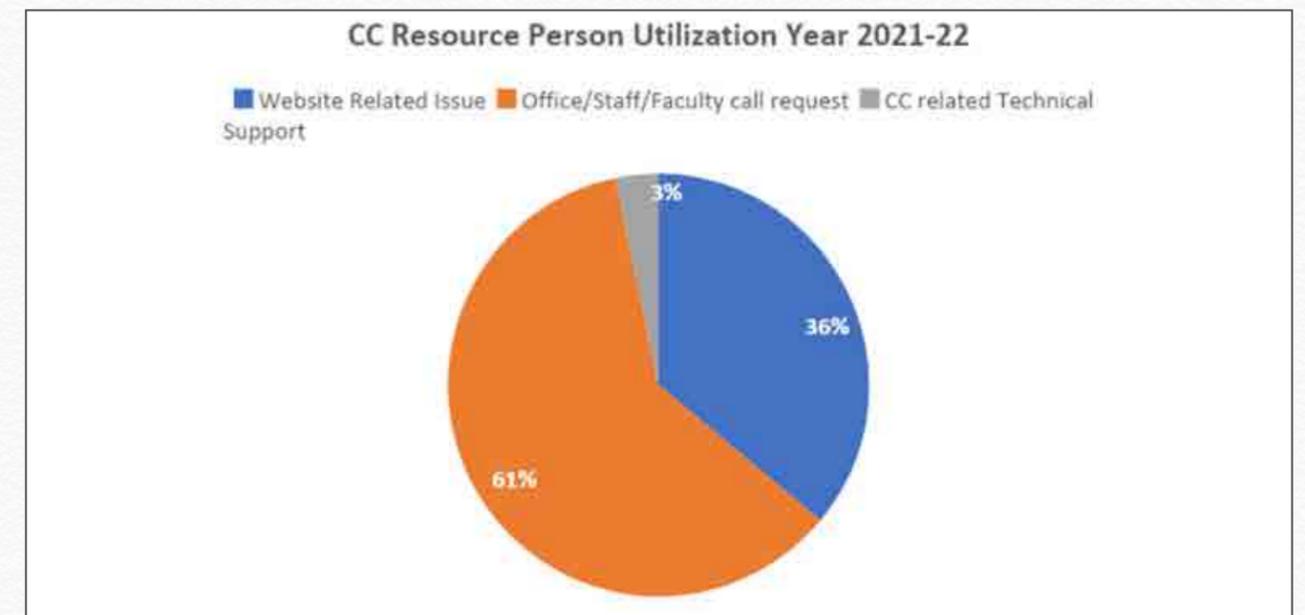
**Facility Management:** It manages central computing facilities including the campus network, central host servers, computing facilities like computers in the center. It also carries out assessment of facilities, both software and hardware, based on the needs of its users, and makes

recommendations for new facilities as necessary for the enhancement of the existing facilities.

**Administrative Data Processing Systems:** It provides infrastructure and technical support for the maintenance of all electronic data processing systems used in administrative offices and departments.

**Learning, Teaching and Research:** Many educational packages and computer-aided learning software are used to enhance the learning capabilities of the students through online mode and delivering lectures and conducting interviews.

The Pie Chart below represents the Computer Center Manpower Resource Utilization for the Year 2021-22.



### Staff

1	Medarisha H. Thangkhiew	Technical Assistant
2	Bandonlang Wahlang	Technical Assistant
3	Arkinsan Wankhar	Technical Assistant
4	Michael Wattre Sangma	Technical Assistant
5	Marveen Rangslang	Technician
6	Ts Thotdharrin Damian	Technician
7	Pynshngainlang Tariang	Laboratory Attendant

# Central Instruments Facility (CIF)

## 1. Brief Introduction to the CIF:

The quality and high-end research is greatly hindered due to insufficient facilities presently available at the institute for conducting experimental and characterization works for different departments. Our faculties and students are taking help from the facilities at IITs and CSIR laboratories located in far off distance. Many times, it is not possible due to multifarious unavoidable reasons. Keeping these issues in mind, the institute has established a Central

Instruments Facility (CIF) within the workshop building in the permanent campus with necessary high-end research tools and equipments (e.g. Powder X-Ray Diffractometer, Fatigue Fracture Testing Machine, Field Emission Scanning Electron Microscopy [FESEM], Metallic 3D printer etc) for carrying out quality research and consultancy work in the premises of the institute itself at the Permanent Campus at Sohra. Considering the increasing numbers of the faculty members, research scholars and the students who are aggressively engaged in their research works, the CIF has been built up in 2021 and the same was inaugurated on April 01, 2022 by the Director of the institute, Professor B B Biswal.

## 2. Faculty Profile:

Name	Designation/ Responsibilities	Qualification	Specialization	Date of Joining	Ph.D. Guidance (ongoing)
<b>Dr. Atanu Singha Roy</b> (Dept. of Chemistry)	Assistant Professor (CIF Chairman)	Ph.D.	Biophysical Chemistry	23-07-2015	06
<b>Dr. Bikash Kumar Sarkar</b> (Dept. of Mechanical Engineering)	Assistant Professor, Faculty-in-Charge of Metal 3D printer, PIC Center of Robotics and Mechatronics (CIF Member)	Ph.D.	Hydraulic system and control, Mechatronics and Robotics	23-08-2013	06
<b>Dr. Dibyendu Adak</b> (Dept. of Civil Engineering)	Assistant Professor, Faculty-in-Charge of FESEM instrument (CIF Member)	Ph.D.	Structural Engineering	03-01-2018	03
<b>Dr. Shubhankar Majumdar</b> (Dept. of Electrical and Communication Engineering)	Assistant Professor, Faculty-in-Charge of Electrochemical Workstation (CIF Member)	Ph.D.	RF, High Speed and Power, Semiconductor Devices, VLSI circuit design and Modeling, Low cost Energy efficient system for Agriculture & Health Sector	13-12-2017	06

Name	Designation/ Responsibilities	Qualification	Specialization	Date of Joining	Ph.D. Guidance (ongoing)
<b>Dr. K. Senthil Kumar</b> (Dept. of Physics)	Assistant Professor (CIF Member)	Ph.D.	DFT, Semiconductor Defects, Heterojunction Solar Cell.	14-07-2015	02
<b>Dr. Adarsha Jena</b> (Dept. of Mathematics)	Assistant Professor (CIF Member)	Ph.D.	Statistics	01-10-2019	--
<b>Dr. Ksh Milan Singh</b> (Dept. of Electrical Engineering)	Assistant Professor (CIF Member)	Ph.D.	Digital Signal Processing, Ultrasonic Vibration Measurement	24-05-2016	03
<b>Dr. Akhilendra Pratap Singh</b> (Dept. of Computer Science and Engineering)	Assistant Professor (CIF Member)	Ph.D.	Service Oriented Network, Architecture, Computer Network, Wireless Sensor, Network	03-09-2013	06
<b>Dr. Gitish K. Dutta</b> (Dept. of Chemistry)	Associate Professor (Dean RC), Faculty-in-Charge of PXRD instrument	Ph.D.	Organic and Hybrid Materials	08-08-2013	03
Dr. Tanmoy Bose (Dept. of Mechanical Engineering)	Assistant Professor Faculty-in-Charge of FFTM instrument	Ph.D.	Machine Design	17-06-2016	02

## 3. Technical Assistant:

Name	Designation/ Responsibilities	Qualification	Date of Joining
<b>Mr. Souradeep Bhowmick</b> (Dept. of Mechanical Engineering)	Technical Assistant	B.E. in Mechanical Engineering	14-12-2021
<b>Mr. Balateiskhem Syiemlieh</b> (Dept. of Chemistry)	Technical Assistant	M.Sc. Chemistry	27-12-2021

## 4. Laboratory Set Up:

Sl. No.	Major Instrument(s)	Location	Instrument Cost (INR)	AMC Value after warranty (INR)	Remarks
1	Powder X-Ray Diffraction (PXRD) <b>Make:</b> MIS Rigaku Corporation, Japan and <b>Model:</b> Rigaku Smart	Central Instruments Facility (CIF), Room 1	1,64,85,000/-	5,25,000/-	Delivered and ready for installation
2	Field Emission Scanning Electron Microscope (FESEM) with EDS <b>Model:</b> Gemini SEM 360 <b>Make:</b> CARL ZEISS	Central Instruments Facility (CIF), Room 1	3,51,83,015/-	22,59,075/-	Not delivered yet

Sl. No.	Major Instrument(s)	Location	Instrument Cost (INR)	AMC Value after warranty (INR)	Remarks
3	Metallic 3D Printer <b>Make:</b> Desktop Metal Inc. <b>Model:</b> Studio 2.0	Central Instruments Facility (CIF), Room 2	2,97,92,439/-	63,00,000/-	Delivered and ready for installation
4	Multichannel Electrochemical Workstation <b>Make:</b> Origalys Electrochem and Origalys France <b>Model:</b> OGFO5A; OGFO1A; OGFEIS Electrochemical workstation	Central Instruments Facility (CIF), Room 2	25,93,500/-	1,26,000/-	Installed
5	Fatigue Fracture Testing Machine (FFTM) <b>Make:</b> MTS Systems Corporation, USA and <b>Model:</b> Landmark 370.10	Central Instruments Facility (CIF), Room 3	2,95,99,500/-	34,49,250/	Installed

## 5. Future Plan:

The Committee is planning to install the following instruments very soon in the CIF Laboratories:

1. Atomic Absorption Spectroscopy (AAS) [Existing facility of the institute, the same will be shifted to the CIF laboratory]
2. Gas Chromatography (GC) [In process]
3. Rheometer
4. BET Surface Analyzer
5. TGA-DSC-STA
6. Transmission Electron Microscope (TEM)

# Centre for Innovation, Incubation and Entrepreneurship

The Centre for Innovation Incubation and Entrepreneurship has been established in 2018 in order to promote the innovation activities among the students, alumni and faculty of NIT Meghalaya. It also aims at sensitizing the stakeholders about the benefits and positive challenges and bringing out their creativity for the benefit of the society in general. The key targets of the centre are

- To provide infrastructure and expertise support to those interested in any kind of innovation and also to solve the industrial problems.
- To create strategic partnerships with various Industries, National and International organizations working towards promoting innovation.

- To develop various skills among students required for successful implementation of ideas.
- To develop entrepreneurs in the North Eastern region of India.

The ideas generated through the Centre can be used by the industry to meet its challenges. Besides this, the Centre also endeavours to see that some of the students of the Institute would become employment – givers than mere employment – seekers with innovative ideas and minimal investments with the support of all the stake holders.

## Members:

Name of the faculty member	Department	Role
Dr. Ch V Rama Rao	Electronics and Communication Engineering	Chairman
Dr. Smrutirekha Sahoo	Civil Engineering	Member
Dr. Pallekonda Ramesh Babu	Mechanical Engineering	Member
Dr. Bunil Balabantaray	Computer Science & Engineering	Member
Dr. Ksh. Milan Singh	Electrical Engineering	Member

### The following events have been conducted during 2020 - 2021:

- The Centre has organized a guest lecture on "Emerging Technologies: IOT AI and Blockchain Application" to the students and faculty members on 9th August 2021 and Mr. Aeroshil Nameirakpam, Co-Founder, Managing Director, Nibiaa Consultancy Pvt Ltd. delivered the lecture.





- The Centre has organized a guest lecture on "Start-up and Innovation" to the students and faculty members on 18th August 2021 and Dr. Anitha Gupta, Scientist-G/Advisor and Head-NSTEDB, Ministry of Science and Technology, Govt. of India delivered the lecture.

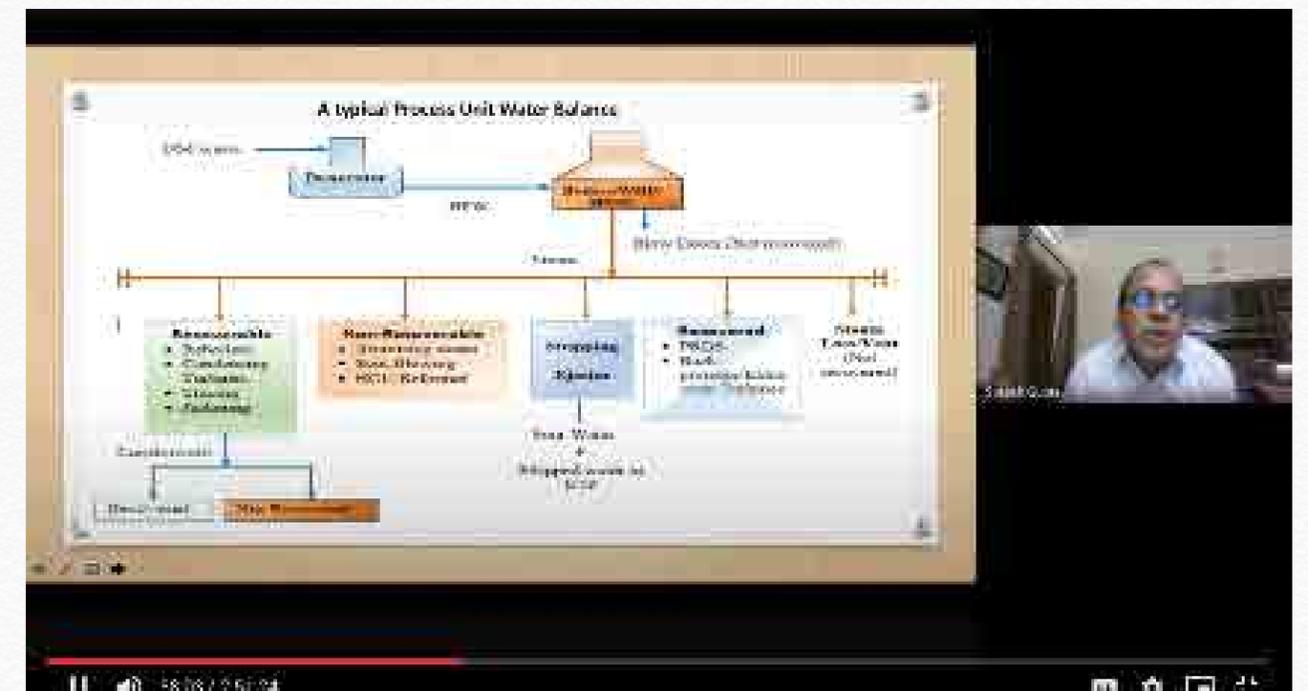


- The Centre has organized a guest lecture on "Entrepreneurship and Institution: Story of SINE and IIT Bombay" to the students and faculty members on 6th September 2021 and Dr. Santhosh J. Gharpure, Professor In-Charge SINE & Perfumery Chair Professor Department of Chemistry, IIT Bombay Powai, delivered the lecture.
- Center celebrated the 15th October 2021 as Innovation Day to mark Dr. A.P.J. Abdul Kalam's Birth Anniversary

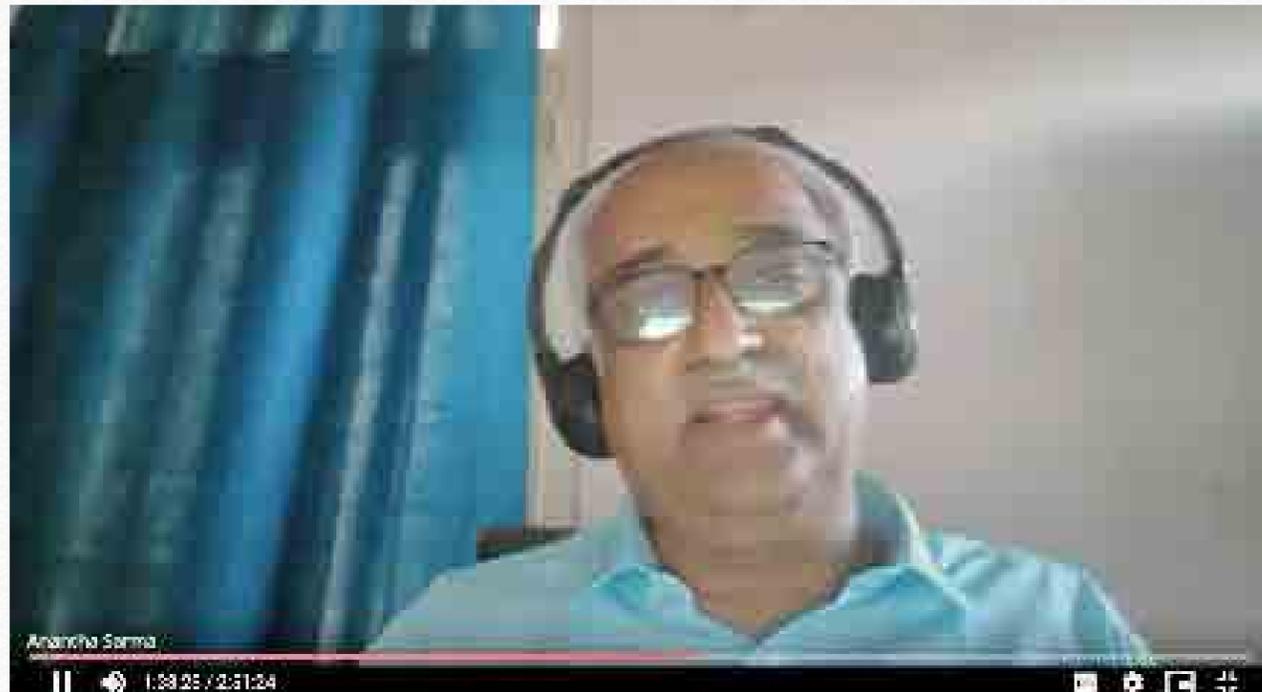
- through online mode. As part of the celebration, the following expert lectures are arranged:
  - Talk on Innovations and Futuristic Technologies by Shri. Suresh Chandra Gupta, Chief General Manager & HoD, R&D Division, Engineers India Ltd., Gurugram.
  - Talk on Innovation and Startup by Shri. B. Anantha Sarma, Executive Director, Power Grid Corporation of India Ltd., Gurugram.



Prof. Ayon Bhattacharjee delivering the inaugural address as part of the Innovation Day celebration at NIT Meghalaya



Shri. Suresh Chandra Gupta delivering the expert lecture on "Innovations and Futuristic Technologies" as part of the Innovation Day celebration at NIT Meghalaya

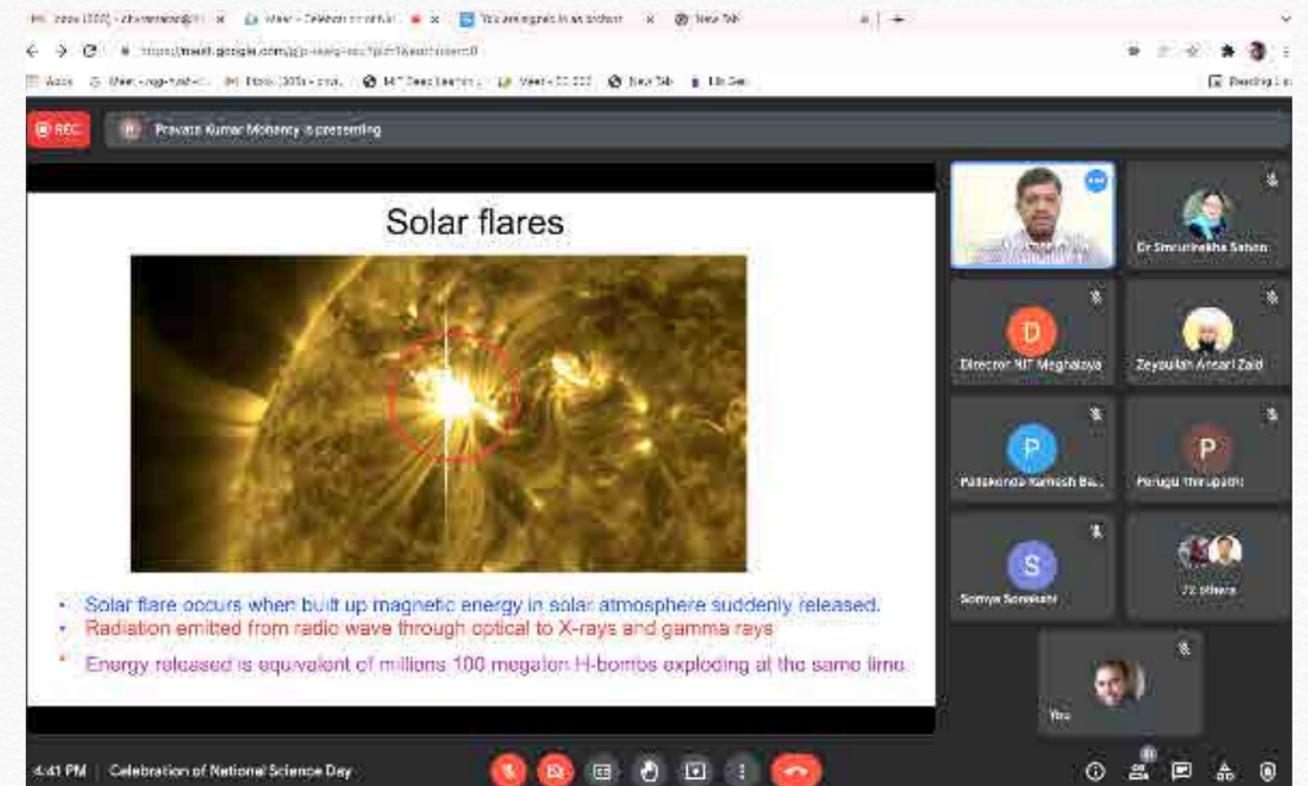


Shri. B. Anantha Sarma delivering the expert lecture on "Innovation and Startup" as part of the Innovation Day celebration at NIT Meghalaya

- The Centre has organized a guest lecture on "Development of technology by Bariflo Labs by using robotics, AI for water body rejuvenation and solving the issue of environmental pollution" to the students and faculty members on 5th November 2021 and Dr. Mrutyunjay Sahu, Managing Director, CTO, BARIFLO LABS Pvt., delivered the lecture.



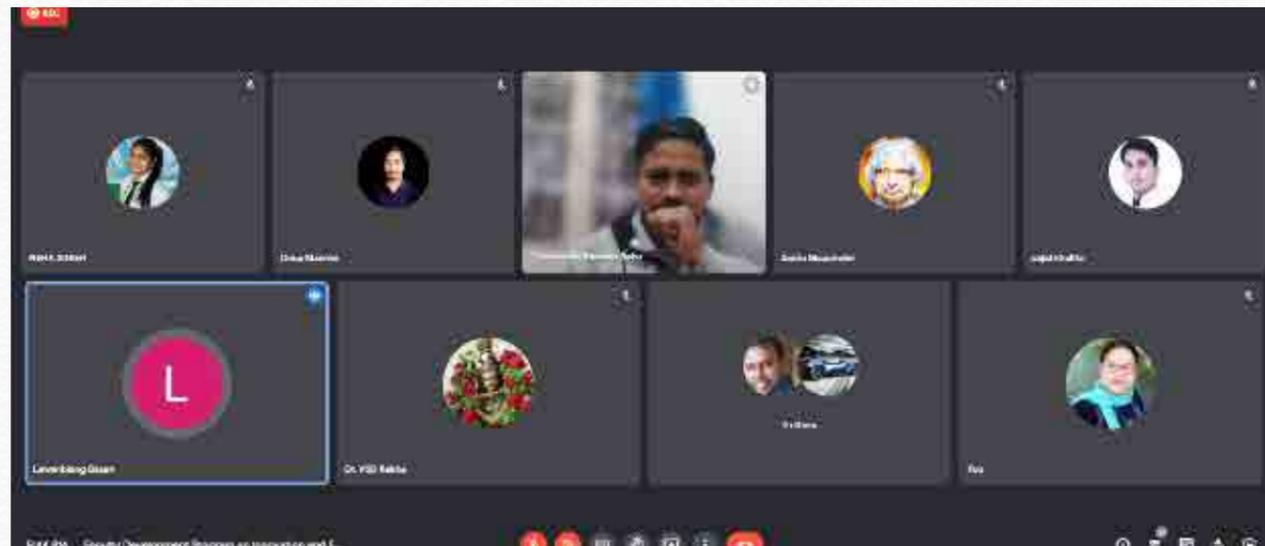
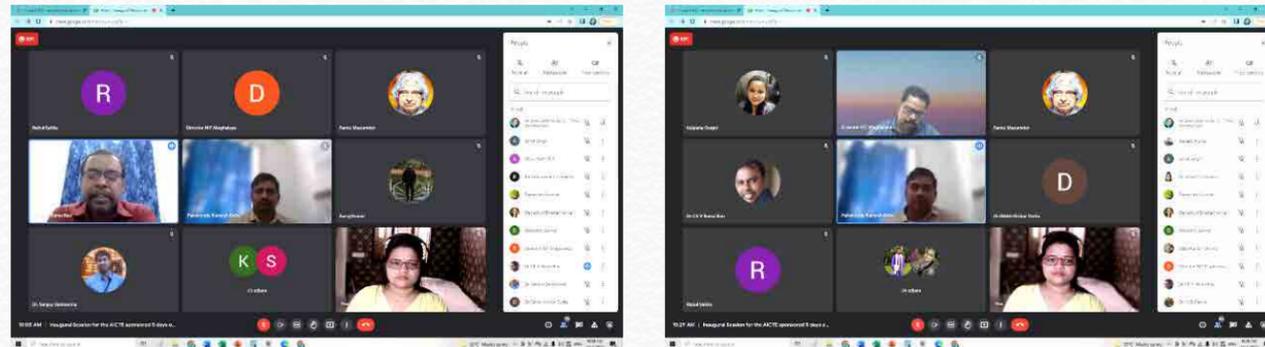
- The Centre organized National Science Day celebrations on 28 February 2022 and as part of the celebrations Prof. Pravata K Mohanty from Department of High Energy Physics, Tata Institute of Fundamental Research delivered a lecture on "Solar storms and their impacts on the earth" to faculty members, staff, scholars, UG and PG students of NIT Meghalaya.



Prof. Pravata K Mohanty delivering the expert lecture on "Solar storms and their impacts as part of the National Science Day celebrations at NIT Meghalaya

- The Centre has conducted the AICTE Sponsored Five Days Online Faculty Development Program on "Innovation and Entrepreneurship" from 22nd March 2022 to 26th March, 2022. The broad scope of this program was to inculcate the innovative ideas and skills in the graduates and research scholars of the technical institutions in the country and also to encourage the innovators to be the best entrepreneurs. The course offered a unique interdisciplinary platform to the engineers and researchers to share and enhance make in India and Atma Nirbhar Bharat. This course was beneficial for the undergraduates, graduates, research students and practicing engineers as well.

Dr. Smrutirekha Sahoo, Assistant Professor in the Department of Civil Engineering and Dr. Pallekonda Ramesh Babu, Assistant Professor in the Department of Mechanical Engineering being the members of Centre for Innovation Incubation and Entrepreneurship (CIIE) NIT Meghalaya has co-ordinated this online FDP. There were total 74 no. of participants registered for this FDP (list of which is attached herewith). Total 15 no. of sessions (i.e., 3 sessions per day) were scheduled in the span of 5 days with 15 no. of experts (academicians and professionals) in the field of "Innovation and Entrepreneurship" from reputed Institutions and/or firms across the country.



# Center for Robotics and Mechatronics

## 1. Brief Introduction to the Center:

The center started in the year of 2017, with the faculty members from various departments like, Mechanical Engineering, Electrical Engineering, Electronics and Communication Engineering and Computer Science Engineering. The Center was officially inaugurated by

Chairman, BoG, Shri Sajjan Bhajanka, Chairman, Century Plyboards (India) Ltd on 1st April 2019.

## 2. Program Offered:

The Center for Robotics and Mechatronics offered finishing school programs for UK graduate students under the UKIERI program.

## 3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Prof. Bibhuti Bhusan Biswal	Professor and Director, NIT Meghalaya	PhD	Design and manufacturing	17-05-2017	01	Nil
Dr. Rabindra Narayan Mahapatra	Associate Professor, HoD, ME	PhD	Design and manufacturing	28-12-2017	02	Nil
Dr. Bikash Kumar Sarkar	Assistant Professor and PIC	PhD	Fluid Power and Control	21-08-2013	03	One Project Scholar, One shared with Dr. S. maity
Dr. Kishore Debnath	Assistant Professor, ME	PhD	Manufacturing	16-07-2015	03	3 Sponsored projects
Dr. Satyendra Singh Yadav	Assistant Professor, EC	PhD	Wireless Communication, Signal Processing for 5G Systems and Beyond, Machine Learning, Parallel (GPU) Computing	10-2019	Nil	Nil
Dr. Shubhankar Majumdar	Assistant Professor, EC	PhD	Microelectronics Device fabrication, Sensor	13-12-2017	02	3 Sponsored projects 5 State Government Projects 2 Ongoing PhD

Name	Designation	Qualification	Specialization	Date of Joining	Ph.D. guidance	Remarks
Dr. Ch V Rama Rao	Assistant Professor, EC	PhD	Acoustics sensor signal processing, Human robot interfacing	28-08-2014	03	3 Sponsored projects
Dr. Bunil Kumar Balabantaray	Assistant Professor, CSE	PhD	Robotics, Computer Vision and Digital Heritage, Human Computer Interaction	14-12-2017	05	Full Time - 1 and with co-supervisor with Prof. R. N. Mahapatra and 3 Part time Ph. D. scholars
Dr. Rakesh Roy	Assistant Professor, EE	PhD	Power System Control, Smart Grid, Optimization, Cyber-Security	19 June 2012	03	1. Sponsored Research projects: 2 2. Sponsored consultancy: 1
Mr. Avilash Sahoo	Trainee Teacher, ME	M. Tech.	Machine Design, Dynamics, Trajectory Tracking Control of Underwater Robots	July 21, 2014		

## 4. List of Publications:

### a. Journals:

- Das, A., Kamal, M., Das, S. R., Patel, S. K., Panda, A., Rafighi, M., & Biswal, B. B. (2022). Comparative assessment between AlTiN and AlTiSiN coated carbide tools towards machinability improvement of AISI D6 steel in dry hard turning. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, 236(6), 3174-3197.
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- Panda, S., Mishra, D., & Biswal, B. B. (2021). Optimum design of 3R manipulator using hybrid PSO-GSA algorithm. *International Journal of Mechanisms and Robotic Systems*, 5(1-2), 111-142.
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- Adhikari, B., Behera, A., Mahapatra, R., & Das, H. (2021). Cell phone related violations and motorcycle accidents: a Bayesian approach. *Operational research in engineering sciences: theory and applications*, 4(3), 107-121.
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- Bezbaruah, P. J., Das, R. S., & Sarkar, B. K. (2021). Experimental and numerical analysis of solar air heater accoutered with modified conical vortex generators in a staggered fashion. *Renewable Energy*, 180, 109-131.
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- Kushwaha, L., Venkaiah, P., & Sarkar, B. K. (2021). PERFORMANCE ANALYSIS OF VERTICAL AXIS WIND TURBINE WITH OPTIMISED PITCH ANGLE VARIATION. *Suranaree Journal of Science & Technology*, 28(2).
- Kumar, N., Kumar, R., Sarkar, B. K., & Maity, S. (2021). Performance Analysis of the Swashplate Axial Piston Pump with Hydraulic Fluid Temperatures.
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- Kumar, G., Yadav, S. S., Yogita, Y., & Pal, V. (2022). Machine Learning based Framework to Predict Finger Movement for Prosthetic Hand. *IEEE Sensors Letters*.
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- Roy, C., Yadav, S. S., Pal, V., Singh, M., Patra, S. K., & Sinha, G. R. (2021). An Ensemble Deep Learning Model for Automatic Modulation Classification in 5G and Beyond IoT Networks. *Computational Intelligence and Neuroscience*, 2021.
- Chiluveru Gnaneshwar, Manish Kumar Singh, Satyendra Singh Yadav, Bunil Kumar Balabantaray. (2021). Analysis of Image Forgery Detection using Convolutional Neural Network. *International Journal of Applied Systemic Studies*. 10.1504/IJASS.2021.10043811
- Prasad, I. B., Yadav, S. S., & Pal, V. (2021). HLBC: A Hierarchical Layer-Balanced Clustering Scheme for Energy Efficient Wireless Sensor Networks. *IEEE Sensors Journal*, 21(22), 26149-26160.

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34. Sharma, P., Balabantaray, B., Bora, K., Mallik, S., Kasugai, K., & Zhao, Z. (2022). An Ensemble-Based Deep Convolutional Neural Network for Computer-Aided Polyps Identification From Colonoscopy. *Frontiers in Genetics*, 13.
35. Harshvardhan, G. M., Sahu, A., Gourisaria, M. K., Singh, P. K., Hong, W. C., Singh, V., & Balabantaray, B. K. (2022). On the dynamics and feasibility of transferred inference for diagnosis of invasive ductal carcinoma: A perspective. *IEEE Access*, 10, 30870-30889.
36. Sahkhar, L., Balabantaray, B. K., & Yadav, S. S. (2022). Efficient Cloudlet Allocation to Virtual Machine to Impact Cloud System Performance. *International Journal of Information System Modeling and Design (IJISMD)*, 13(6), 1-21.
37. Hansda, R., Nayak, R., Balabantaray, B. K., & Samal, S. (2022). Copy-Move Image Forgery Detection Using Phase Adaptive Spatio-structured SIFT Algorithm. *SN Computer Science*, 3(1), 1-16.
38. Harshvardhan, G. M., Sahu, A., Gourisaria, M. K., Singh, P. K., Hong, W. C., Singh, V., & Balabantaray, B. K. (2022). On the dynamics and feasibility of transferred inference for diagnosis of invasive ductal carcinoma: A perspective. *IEEE Access*, 10, 30870-30889.
39. Dutta, A., Ashishkumar, G., & Rao, C. V. R. (2021). Performance analysis of ASR system in hybrid DNN-HMM framework using a PWL euclidean activation function. *Frontiers of Computer Science*, 15(4), 1-11

Sl. No.	Name	Number of Journals (From June 2021 to July 2022)
1	Prof. Bibhuti Bhusan Biswal	04
2	Dr. Rabindra Narayan Mahapatra	04
3	Dr. Bikash Kumar Sarkar	07
4	Dr. Kishore Debnath	08
5	Dr. Satyendra Singh Yadav	05
6	Dr. Shubhankar Majumdar	05
7	Dr. Ch. V. Rama Rao	01
8	Dr. Bunil Kumar Balabantaray	05
9	Dr. Rakesh Roy	00
10	Mr. Avilash Sahoo	01

## b. Conferences:

- Alom, N., & Sarkar, B. K. (2021, December). Effect of Exit Blade Angle on the Performance of Cross Flow Hydro Turbine: A Numerical Study. In *Gas Turbine India Conference* (Vol. 85536, p. V001T09A007). American Society of Mechanical Engineers.
- Pattanayak, S. R., Venkaiah, P., Sarkar, B. K., Pattanayak, B., & Das, H. C. (2021). Modelling and control of parabolic trough field system for feed water heating application. In *Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference December 17-20, 2021, IIT Madras, Chennai-600036, Tamil Nadu, India*. Begel House Inc.
- Singh, M., Gupta, S., Yadav, S. S., Pal, V., & Patra, S. K. (2021, December). Performance Evaluation of Visible Light Communication System based on Optical Power Distribution with Channel Delay Spread and SNR. In *2021 Advanced Communication Technologies and Signal Processing (ACTS)* (pp. 1-5). IEEE.
- Kuwal, V., Yadav, S. S., & Dandapat, A. (2021, May). Analysis of the Universal Gates based on the Comparative Factors of Delay Propagation, Average Power Dissipation and Logical Effort. In *2021 2nd International Conference for Emerging Technology (INCET)* (pp. 1-7). IEEE.
- Bhargava, G., & Majumdar, S. (2022, January). Design of Novel Rat-Race Coupler Based Analog Pre-Distortion Circuit for 5G Applications. In *2022 International Conference for Advancement in Technology (ICONAT)* (pp. 1-4). IEEE.
- Naresh, K., Majumdar, S., Sai, Y. P., & Sai, P. R. (2021, December). Efficient design of artificial neural networks using approximate compressors and multipliers. In *2021 IEEE International Symposium on Smart Electronic Systems (ISES)(Formerly iNIS)* (pp. 153-156). IEEE.
- Bhargava, G., & Majumdar, S. (2021, May). Highly Linearized GaN HEMT Based Class E/F3 Power Amplifier. In *2021 Devices for Integrated Circuit (DevIC)* (pp. 564-568). IEEE.
- Pradhan, A. K., Rout, J. K., Maharana, A. B., Balabantaray, B. K., & Ray, N. K. (2021, December). A Machine Learning Approach for the Prediction of Fetal Health using CTG. In *2021 19th OITS International Conference on Information Technology (OCIT)* (pp. 239-244). IEEE.
- Parihar, L., Madhu, A., Debnath, D., Roy, R., & Choudhury, T. R. (2021, December). Least Component Count Off-Grid Solar Photovoltaic Scheme for Rural Household Application. In *2021 National Power Electronics Conference (NPEC)* (pp. 1-6). IEEE.
- Roy, R., Kumar, A., Kumar, A., Jamatia, A., Kasari, P. R., Das, B., & Chakrabarti, A. (2021, October). MMCC Based Decoupled Control of PMSG for Small Scale Hydro Power Plants. In *IECON 2021-47th Annual Conference of the IEEE Industrial Electronics Society* (pp. 1-6). IEEE.

Sl. No.	Name	Number of Conferences (From June 2021 to July 2022)
1	Prof. Bibhuti Bhusan Biswal	00
2	Dr. Rabindra Narayan Mahapatra	00
3	Dr. Bikash Kumar Sarkar	02
4	Dr. Kishore Debnath	00
5	Dr. Satyendra Singh Yadav	02
6	Dr. Shubhankar Majumdar	03
7	Dr. Ch V Rama Rao	00
8	Dr. Bunil Kumar Balabantaray	01
9	Dr. Rakesh Roy	02
10	Mr. Avilash Sahoo	00

## 5. Patents

- P Singh, V Kumar, S Gupta, N Jha, N Arya, R Gupta, Sketch completion using machine learning, US Patent 10,650,290
- S. Majumdar, S. Akashe, A. Chaudhary, A. Verma, "Automatic refilling soil tensiometer and tip rinsing mechanism through fluid whirls," Indian Patent, Application No. 201931005912 (Filed).
- Rajesh Tiwari, Manisha Sharma, Kamal Mehta, Mohan Awasthy, Rajeev Shrivastava, Mangal Singh, Tarun Dhar Diwan, Akshat Tiwari, Ajay Tiwari, Begum Suriya, Satyendra Singh Yadav, Artificial Intelligence and Big Data Analytics based Insurance Service Fraud Detection System, Patent number 2021101568.

## 6. Sponsored Projects:

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount (INR)	Duration	Status
1	Modeling and Control of the hydraulically actuated Ring Inlet Guide Vane of Francis Turbine by Adaptive Neural Network Sliding mode Controller Design	Dr. B. K. Sarkar	DST-SERB	39,42,600	3 years	Ongoing
2	Design and Development of the Small Wind Turbine Combined with Solar system for Household Application	Dr. B. K. Sarkar, Dr. D. K. Sarma, Dr. S. Maity	MHDR-DIC	3.2 lakhs	2 years	On-going
3	Design and development of the Nano-hydro Turbine for Standalone Household Power Generation	Dr. B. K. Sarkar, Dr. H. M. Kalita	MHDR-DIC	1.1 lakhs	2years	On-going
4	Development of Green Composites-based Products using Injection Moulding	Dr. K. Debnath	TEQIP-III	2,00,550/-	2 years	On-going
5	Development of Low-Cost Fully-Biodegradable Plastic-Bamboo Board for Structural Applications	Dr. K. Debnath	SCSTE	1,00,000/-	1 year	On-going
6	Standalone solar Tea/Coffee Maker Cum multipurpose Water Heating System	Dr. K. Debnath	DIC-MHRD	8,57,200.00	2 years	On-going
7	Prediction, Detection and monitoring System for Landslide in Hilly Region	Dr. Shubhankar Majumdar	Department of Science & Technology (International Bilateral Cooperation Division)	626000 +\$50000 (Japanese side)	2 Years	On-going
8	Tensiometer based automated IoT system for irrigation	Dr. Shubhankar Majumdar	DST-DDP	16,84,941.00	2 Years	On-going
9	Cloud-assisted Data Analytics based Real-Time Monitoring and Detection of Water Leakage in Transmission Pipelines using Wireless Sensor Network for Hilly Regions	Dr. Shubhankar Majumdar	MoEF&CC under (NMHS)	44,70,880	3 Years	On-going

Sl. No.	Title of the Project	Investigators (P.I. / Co-P.I.)	Funding Agency	Funding amount (INR)	Duration	Status
10	Phonetic and Prosodic Analysis of Khasi Language	Dr. Ch. V. Rama Rao	DST-SERB	16,13,280.00		On-going
11	Post-Processing of NQR Signals in Digital Domain in FPGA	Dr. Ch. V. Rama Rao	BRNS, DAE, Gol	20,03,000.00		On-going
12	Masking of interfering sounds in a crowded environment for hearing aid applications	Dr. Ch. V. Rama Rao	DST-SERB-	23,46,447.00		On-going
13	1.Cloud-Assisted Hybrid Renewable Energy Sources for Electricity and Water Supply in Rural Area. 2. Smart Agro Modular System. 3. Smart Blind Stick. 4. A Self Sustained Multiple Sensor IoT Based Landslide Detector Early Warning System. 5. A portable Wind-Hydro Hybrid Electronic Charger Targeted for Outdoor Activities and Military Applications.	Dr. Shubhankar Majumdar	State Council of Science, Technology & Environment	99,960 INR 46,465 INR 19,950 INR 49,335 INR 49,742 INR	1 year	On-going

## 7. Laboratories Setup:

Sl. No.	Laboratory	Major Equipment & Software	Location	Cost (Rupees in lakhs)
1	Centre for Robotics & Mechatronics	Intel Real Sense Depth Camera Model: 82635D4351DK5P Make: INTEL	Centre for Robotics & Mechatronics	30,240.00

## 8. Administrative Responsibilities Held:

Sl. No.	Name of Faculty	Responsibilities	Duration
1.	Dr. B. K. Sarkar	1. Centre-In-Charge, Centre for Robotics & Mechatronics	
3	Dr. R. N. Mahapatra	1. Head of the Department, ME	
4	Dr. K. Debnath	1. Faculty-In-Charge, Mechanical Workshop	July 2015 - till date
6	Dr. Shubhankar Majumdar	1. NBA Departmental Committee. 2. Warden of Lapalang Boy's Hostel-1. 3. Faculty Advisor of B. Tech. EC-2018 batch 4. Faculty Incharge of Coding Club 5. Convener of Innovation & Entrepreneurship Club 6. TPC, Session Chair and Reviewer of VLSI-DCS 2022 conference	On-going

Sl. No.	Name of Faculty	Responsibilities	Duration
7	Dr. Ch. V. Rama Rao	<ol style="list-style-type: none"> <li>Taking care of administrative issues in the Library, Library Chairman.</li> <li>Preparing and monitoring of class routine for ECE Department.</li> <li>Member in Class Routine Committee.</li> </ol>	2015 - till date 2015-2016
8	Dr. Bunil Kumar Balabantaray	<ol style="list-style-type: none"> <li>Institute Internship</li> <li>Warden, KT Hostel</li> <li>Convener, Volunteer Sub-Committee, Convocation 2019</li> <li>Member, Technical Committee, SAC</li> <li>Convener, NBA Preparation Committee</li> <li>Member, CCMT-2019 and CCMT-2020</li> <li>Member, Outcome Based Education, Steering Committee</li> <li>Member, Institute Start-up Committee under TEQIP-III</li> </ol>	<ol style="list-style-type: none"> <li>July 2018 to till continuing</li> <li>Dated: 06.08.2019</li> <li>From 23.09.2019 till continuing</li> <li>From 23.01.2018 to till continuing</li> <li>From April 2019 to till continuing</li> <li>From 04.12.2018 to till continuing</li> <li>From 08.09.2018 to till continuing</li> <li>From 08.09.2018 to till continuing</li> </ol>

## 9. Membership of Professional Bodies:

Sl. No.	Name of Faculty	Member of
1	Dr. Bikash Kumar Sarkar	<ol style="list-style-type: none"> <li>ASME Member 100784361, 2016</li> <li>IEEE, IEEE Control Systems Society Member 92662020, 2016</li> <li>NSFMFP Life Member, LM631</li> <li>ISHMT Life Member, 1064</li> </ol>
2	Mr. Avilash Sahoo	<ol style="list-style-type: none"> <li>ASME Member 102607760, 2019</li> <li>IEEE Member 94145936, 2020</li> </ol>
3	Dr. R. N. Mahapatra	<ol style="list-style-type: none"> <li>ISTE, Life member</li> <li>ACSIT, Member</li> </ol>
4	Dr. Shubhankar Majumdar	<ol style="list-style-type: none"> <li>Institute of Electrical and Electronics Engineers (IEEE) - 927753442.</li> <li>Electrochemical Society (ECS) - 406059</li> <li>Union Radio-Scientifique Internationale (URSI) - M1838573204</li> <li>International Association of Engineers (IAENG) - 208814 (Lifetime)</li> </ol>
5	Dr. Bunil Kumar Balabantaray	<ol style="list-style-type: none"> <li>ISTE (LM),</li> <li>Soft Computing Research Society, India., Associate Member (UACEE),</li> <li>Institute of Research Engineers and Doctors, (Membership No: AM10100057923)</li> </ol>

# Centre for Technology Enabled Learning

## BRIEF INTRODUCTION TO THE CTCL:

The fantastic growth of Information technology (IT) over the last few decades has changed almost every part of our daily life. In order to exploit the technology to benefit our society in a major way, it is necessary to devote time and attention to engineering, expansion, as well as spreading of quality education in related areas. As part of a national initiative from the Ministry of Human Resource Development, the present endeavor has been mainly towards providing the required infrastructure and connectivity to the institutions of higher education like IITs and NITs. The objective is to create and manage a rich pool of digital resources and utilize them to provide quality certification programme and courses, which can be used by the universities as well as government and non-government organizations.

In its quest to make quality higher education accessible to the masses, the Government of India has been very keen to use the technological resources that are being developed to achieve the mission. As a major step in this direction, it had launched the National Mission on Education through Information and Communication Technology (NMEICT) in 2009 to allow eminent teachers and experts in the country to pool their collective wisdom for the benefit of every Indian

individual who is willing to learn. This will greatly help in reducing the digital divide, which has traditionally plagued our society. In addition to quality content generation, the mission also aims to promote research in critical areas relating to imparting education to the masses.

In the present context, it has been felt that there is a need to extend the reach of the mission to the north-eastern states of the country where reach ability of quality higher education is severely hampered due to unfriendly terrains, societal orientations, etc. As the first step in this direction, the Centre for Technology Enabled Learning (CTEL) has been set up in the NIT Meghalaya Campus, which will allow teachers to develop content, spread awareness in various regions of the north-east, and join the national initiative in a big way. The Centre strives to become the gateway of the north-east to achieve the goals of the national mission.

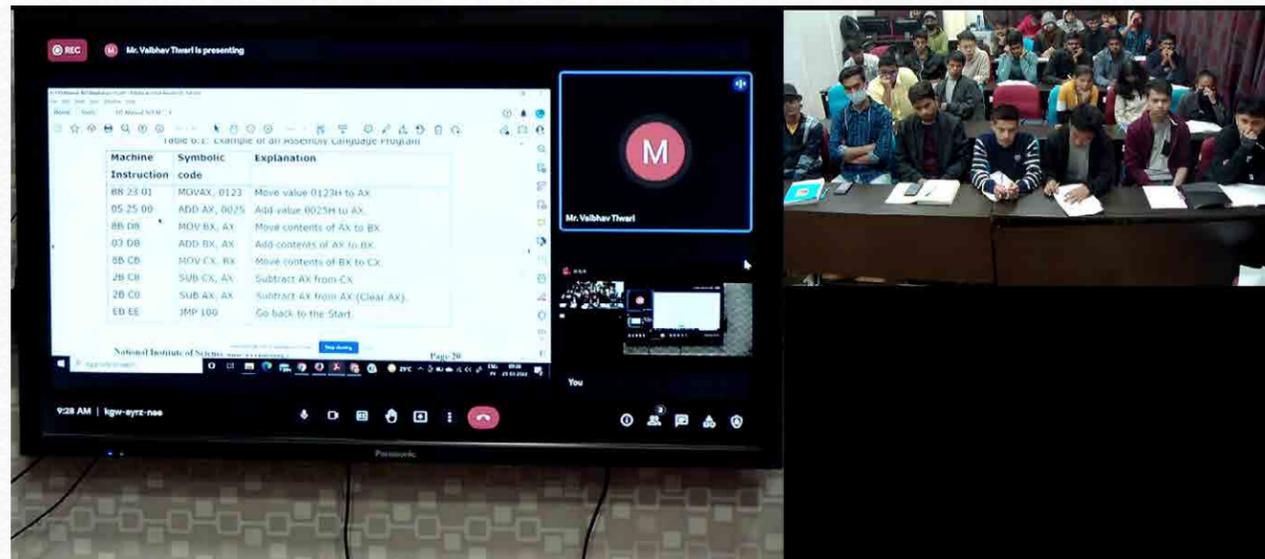
A state-of-the-art studio has been set up in the centre where facilities for both content creation and content distribution are being provided. Faculty members of the Institute as well eminent experts from other institutions and organizations are being approached to develop technically high-quality video contents, which will be made available to the students through on-line streaming technology. Through this studio, faculty members of NIT Meghalaya and also neighboring Institutes can participate in developing contents and directly assist in national initiatives like NPTEL and SWAYAM.

## STAFF DETAILS:

SI No.	NAME	DESIGNATION
1.	Dr. Pradeep Kumar Rathore	Professor-In-Charge
2.	Mr. Sanju Mizar	Technical Assistant

## ACTIVITIES IN CTEL

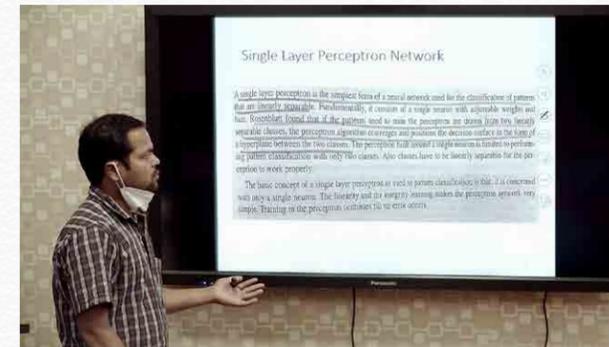
- I. Course Lecture Recording
- II. Ph.D. Defense Seminar
- III. Invite Talk/ Guest Lecture
- IV. Other Activities



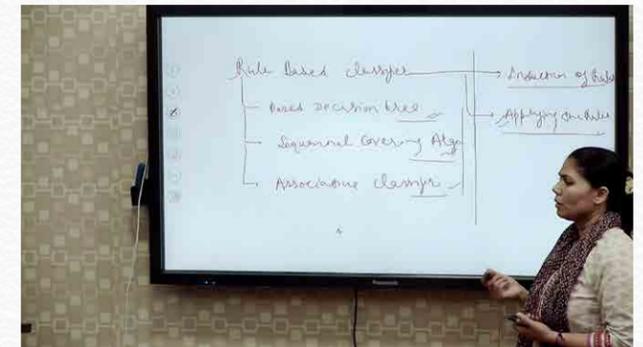
STUDENTS ATTENDING LIVE CLASS AT CTEL

### LIST OF ITEMS/ EQUIPMENT THAT HAVE BEEN INSTALLED AT CTEL RECORDING ROOM:

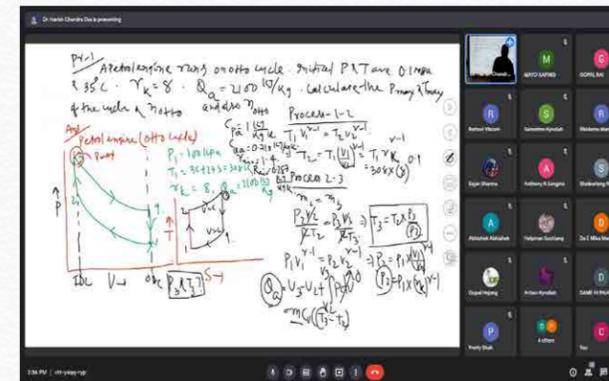
Panasonic LED Screen 65" Display cum White Board, Ma240 Audio Mixing Amplifier, Digital Wireless Head Worn Microphone Set, Digital Wireless Head Held Microphone Set, Lumens PTZ Camera, Crestron Air board Whiteboard Capture, Digital Graphics Engine, HDMI Switcher, HD Scaling Auto Switcher and HDMI, Media Presentation Controller along with Table top Kit, Magnetic Whiteboard of Size 6ft by 4ft, Digital Metallic Podium, Light Fixture.



Dr. Bunil Balabantaray, Department of Computer Science & Engineering



Dr. Yogita, Department of Computer Science & Engineering



Dr. Harish Chandra Das, Department of Mechanical Engineering



Dr. Vipin Pal, Department of Computer Science & Engineering



Dr. Anup Dandapat, Department of Electronics & Communication Engineering



Dr. Abhishek Sarkhel, Department of Electronics & Communication Engineering

## LECTURES RECORDED AT CTEL

(1st April 2021 – 31st March 2022)

SI No.	Department	Name of the Faculty	Total no. of Lectures
1	Computer Science & Engineering	Dr. Vipin Pal	67
		Dr. Yogita	5
		Dr. Bunil Balabantaray	35
		Dr. Diptendu Sinha Roy	5
2	Electronics and Communication Engineering	Dr. Anup Dandapat	52
		Dr. Prabir Kumar Saha	5
		Dr. Rangababu P	1
		Dr. Abhishek Sarkhel	22
3	Mechanical Engineering	Dr. Harish Chandra Das	67
<b>TOTAL</b>			<b>259</b>

## LIST OF OTHER ACTIVITIES AT CTEL

SI No	Date	Name of the Student/ Faculty/Staff	Department	Activities
1	07-04-2021	Mr. Shashi Kumar	EC	PhD Defense Seminar
2	12-04-2021	Mr. RekitabUddin Ahmed	EC	PhD Defense Seminar
3	26-07-2021	Dr. Pradeep Kumar Rathore	EC	ATAL FDP on MEMS Technology & Microsensors
4	15-09-2021	Mr. Kaibalya Prasad Panda	EE	PhD Defense Seminar
5	17-09-2021	Kakoli Baruah	CY	Registration seminar
6	23-09-2021	Dr. N.K Nath	CY	Registration seminar
7	24-09-2021	Kaushik Bora	CE	PhD Defense Seminar
8	04-10-2021	Raja Gandhi	EE	Enhancement Seminar
9	06-10-2021	Sheba Diamond Thabah	EC	Enhancement Seminar
10	26-10-2021	Mr. Kaushik Ray	CS	Enhancement Seminar
11	03-12-2021	Priyanka		Pre-Thesis Seminar
12	03-12-2021	Dr. Paonam Sudeep Mangang	HS	Progress Seminar
13	09-12-2021	Sikha	PH	Progress Seminar
14	13-12-2021	Pritam Majumdar	ME	Pre-Submission
15	13-12-2021	Dr. S. Maity	ME	Pre-Thesis seminar
16	14-12-2021	Anup Jyoti Das	ME	Progress Seminar
17	15-12-2021	Susmay Nandi	MA	Pre-Submission
18	15-12-2021	Karma Hissey	CE	Progress Seminar
19	15-12-2021	Miss. Rupali Roy	EC	Progress Seminar
20	16-12-2021	Dr. S S Devi	EC	PhD Registration seminar
21	17-12-2021	Himashree Mahanta	CY	Pre-Submission
22	03-02-2022	Narendra Babu P	EE	PhD Defense Seminar
23	01-03-2022	Rabindra		Research Conclave
24	15-03-2022	Dr. M Saha	MA	FDP Program

## LECTURE HALL

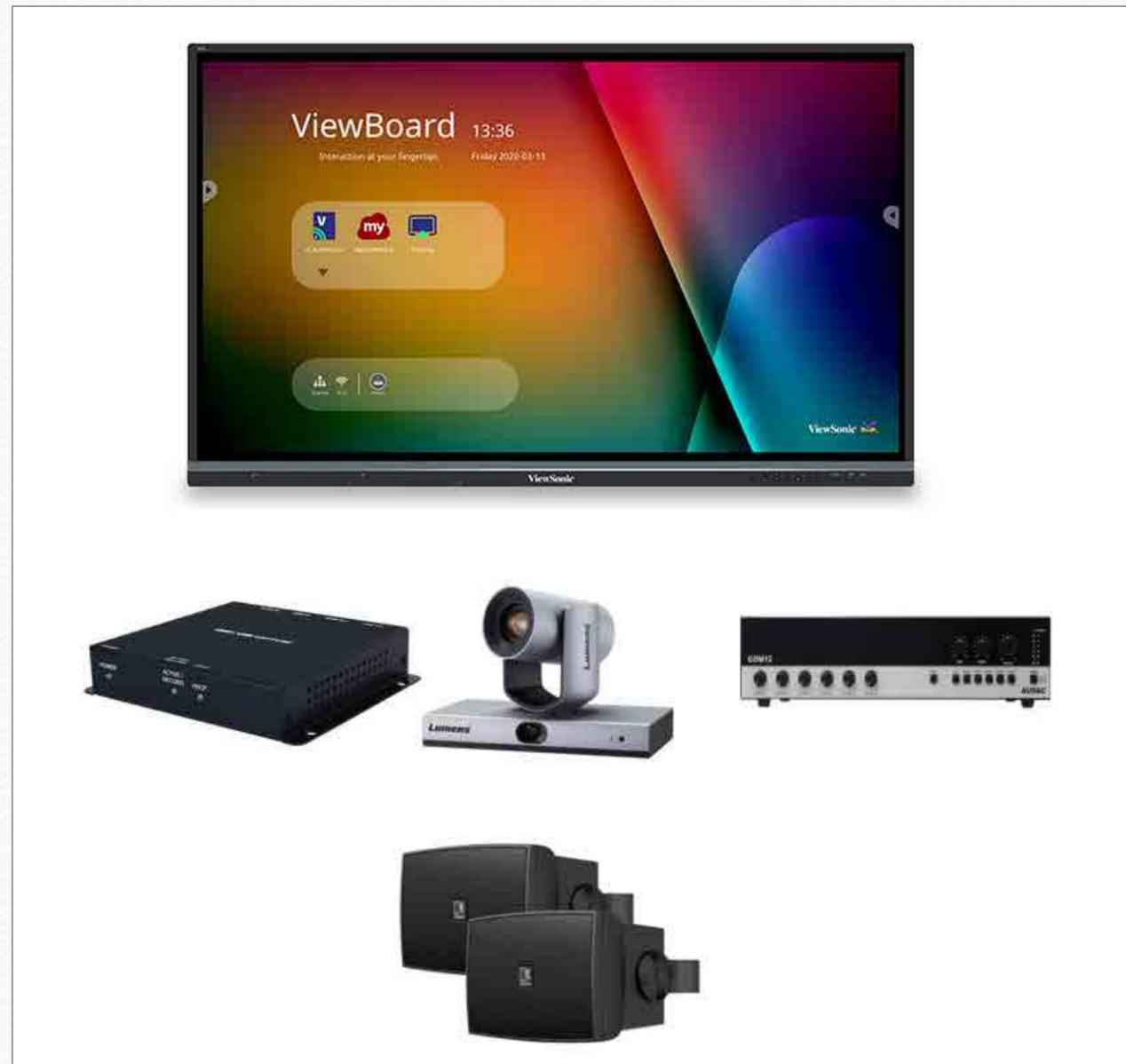
Recently, the existing Lecture Hall has been upgraded to a smart classroom for online teaching and learning purposes. The entire system is to be established for CTEL Expansion by the upgradation of the Lecture Hall to Smart Classroom. This facility is also being used for conducting invited lectures, student and faculty seminars and conferences etc.



SMART CLASSROOM

## LIST OF EQUIPMENT THAT HAVE BEEN INSTALLED AT LECTURE SMART CLASSROOM

Multi touch 86" Display, Digital Wireless Head Worn Microphone Set, Lumens Tracking Camera for Presenter, HDMI to USB Converter for Soft VC, 4 Wall Mount Speaker, Amplifier cum Mixer, 8Port Network Switch, Rack Mount 1000VA Online UPS, Wall Mount Rack 12 U Network Rack



# ANNUAL ACCOUNTS 2021-2022

## LIST OF OTHER ACTIVITIES AT LECTURE HALL

SI No	Date	Name of the Student/ Faculty/Staff	Department	Activities
1	28-02-2022	Rabindra	Academic Office	Research Conclave
2	08-03-2022	Dr. Susmita Sharma	CE	International Women's Day
3	31-03-2022	Mr. Pritam Majumder	ME	Pre-Submission Seminar



शेफाली एस. अंदलीव, आई.ए. एण्ड ए.एस.  
Shefali S. Andaleeb, IA & AS  
प्रधान महालेखाकार (लेखापरीक्षा)  
Principal Accountant General (Audit)  
मेघालय, शिल्लोंग  
Meghalaya, Shillong



भारत सरकार, Government of India  
भारतीय लेखापरीक्षा और लेखा विभाग  
Indian Audit & Accounts Department

DO No. AMG-I/NIT/8-16/2022-23/1293  
Dated: 13 March 2023

I enclose the Separate Audit Report on the accounts of the National Institute of Technology (NIT), Shillong for the year 2021-22 and a set of audited Annual Account of the NIT for the year 2021-22.

2. The Hindi version of the Separate Audit Report will be prepared by the NIT.
3. The Separate Audit Report and the Annual Accounts sent may please be placed before both Houses of Parliament as soon as possible. The date(s) of placing of the Report and Accounts may please be intimated and ten copies of the Report, placed before Parliament, may please be sent to this office for record.
4. The Separate Audit Report may please be treated as Confidential till it is placed before the Parliament.

Kindly acknowledge receipt.

*Yours sincerely,*

*Sd/-*

Shri K. Sanjay Murthy,  
Secretary to the Government of India,  
Ministry of Human Resource Development,  
Department of Higher Education,  
Shastri Bhavan,  
New Delhi-110001.

Memo No. AMG-I/NIT/8-16/2022-23/1294

Dated: 13 March 2023

Copy of the Separate Audit Report on the accounts of the of the National Institute of Technology (NIT), Shillong for the year 2021-22 are forwarded for information and necessary action to:

The Director,  
National Institute of Technology (NIT),  
Bijini Complex, Laitumkhrah,  
Shillong-793003.

2. Necessary arrangement may please be made for preparation of Hindi version of the Separate Audit Report and issue of the same to the Government of India, Ministry of Human Resource Development, with copy to this office.
3. The date(s) of placing the Separate Audit Report and Annual Accounts before both Houses of Parliament may please be intimated.
4. The Separate Audit Report sent herewith may please be treated as confidential till it is placed before both Houses of Parliament.

Kindly acknowledge receipt.

  
Deputy Accountant General/AMG-I

**Separate Audit Report of the Comptroller and Auditor General of India on the accounts of National Institute of Technology (NIT), Meghalaya for the year ended 31 March 2022**

We have audited the attached Balance Sheet of the National Institute of Technology (NIT), Meghalaya as at 31 March 2022, the Income and 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, Powers and Conditions of Service) Act, 1971 read with Section 22(2) of the National Institute of Technology (NIT) Act, 2007. These financial statements are the responsibility of the NIT'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 & 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 & 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 mis-statements. 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 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 and Income and Expenditure Account/Receipts and Payments Account dealt by this Report have been drawn in the revised format of accounts prescribed by Ministry of Education, Government of India for Central Educational Institutions.

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

**IV.** We further report that:

**A. Balance Sheet**

**Current Assets (Schedule- 7)**

**Cash and Bank Balances**

**In Term Deposits - ₹ 77.89 crore**

**In Savings Accounts - ₹ 31.20 crore**

**A1.** The following Fixed Deposits opened by the Institute on behalf of Trainee Teachers was not included in its accounts of the Institute-

Sl. No.	Bank	FD No.	Amount in ₹
1.	UCO Bank	23730310016534	793,090
2.	UCO Bank	23730310016558	793,090
3.	UCO Bank	23730310016572	793,090
4.	UCO Bank	23730310016589	771,500
5.	UCO Bank	23730310016596	708,132
		<b>Total</b>	<b>38,58,902</b>

These FDs were opened by the Institute by deducting a percentage from the salaries of the Trainee Teachers as Bond and are refundable to them on successful completion of terms of appointment. Since, these FDs were opened and also be withdrawn only by the Institute. It should have been in the accounts of the Institute, which was however not done. This has resulted in understatement of Cash and Bank Balances- In Term Deposits and Current Liabilities by ₹ 38.59 lakh.

**A2.** The Institute also did not include a Bank Account opened by the Institute with State Bank of India out of funds received for a sponsored project in the accounts. The Bank balance of the Account as on 31.03.2022 was ₹ 7,19,611. Since, the account was opened and operated by the Institute it should have been shown in the accounts of the which was however not done. This has resulted in understatement of Current Assets as well as Current Liabilities by ₹ 7.19 lakh each.

**B. Income and Expenditure Account**

**Administrative and General Expenses (Schedule- 17)**

**Rent, Rates & Taxes - ₹ 5.90 crore**

**B1.** The Institute during the year paid (September 2021 and March 2022) a total amount of ₹ 1.39 crore lakh as rent for the year to North Eastern Hills University (NEHU) for use of its premises for operating the Institute's temporary campus. The Institute however wrongly provided an amount of ₹ 1.39 crore for rent payable to NEHU for the year 2021-22, though it had already been paid. This has resulted in Overstatement of Rent, Rates & Taxes and Other Liabilities by ₹ 1.39 crore. The Surplus for the year is also understated by ₹ 1.39 crore.

**C. General:****C1. Grants-in-Aid:**

The opening balance of Grants-in-Aid was ₹ 111.02 crore. During the year 2021-22, an amount of ₹ 72.93 crore grant was received. Out of available balance, an amount of ₹ 111.21 crore was utilised, leaving an unspent balance of grant of ₹ 72.74 crore as on 31 March 2022 as depicted in the books of account.

**D. Management Letter:** Deficiencies which have not been included in the Audit Report have been brought to the notice of the Director, National Institute of Technology, Meghalaya through a Management Letter issued separately for remedial/corrective action

**V.** Subject to our observations in the preceding paragraphs, we report that the Balance Sheet, Income and Expenditure Account and Receipts and Payments Account dealt with by this report are in agreement with the books of accounts; and

**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** 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 (NIT), Meghalaya as at 31 March 2022; and

(b) In so far as it relates to Income and Expenditure Account of the Surplus for the year ended on that date.

For and on behalf of the C&AG of India



Shefali S Andaleeb  
Principal Accountant General (Audit)  
Shillong, Meghalaya

Place: Shillong  
Dated: 13.03.2023

**ANNEXURE I TO SEPARATE AUDIT REPORT****1. Adequacy of Internal Audit System:**

The Institute has set up an Internal Audit Wing, however, the scope of the wing is limited to scrutiny of bills before making payments. Further, the Internal Audit Wing has not submitted any Internal Audit Reports.

**2. Adequacy of Internal Control System**

The following deficiencies in Internal Control System were observed:

- (i) Confirmation of Debtors/Loans and Advances from respective parties was not taken.
- (ii) The Institute has not developed any manual relating to Accounts and Audit.
- (iii) The Institute had 11 dormant accounts (1 current account and 10 savings accounts) with a total balance of ₹ 10.28 lakh which were yet to be closed down.

**3. System of Physical Verification of Fixed Assets:**

The Institute had conducted Physical Verification of its assets as on 31 March 2022.

**4. System of physical verification of Inventory:**

The Institute had conducted Physical Verification of Inventory as on 31 March 2022.

**5. Regularity in payment of statutory dues:**

The Institute has been regular in payment of statutory dues. However, it failed to deduct TDS on GST on some bills of Contractors/Suppliers while making payment to them.



Sr. Audit Officer/AMG-I

## National Institute of Technology, Meghalaya

### Balance Sheet as at 31st March 2022

[Amount in ₹]

SOURCES OF FUNDS	Schedule	Current Year	Previous Year
<b>CORPUS/CAPITAL FUND</b>	1	3365413536.54	2699003378.62
<b>DESIGNATED/ EARMARKED / ENDOWMENT FUNDS</b>	2	119161853.00	114039838.00
<b>CURRENT LIABILITIES &amp; PROVISIONS</b>	3	956719958.18	1380720167.96
<b>TOTAL</b>		<b>4441295347.72</b>	<b>4193763384.58</b>
<b>APPLICATION OF FUNDS</b>			
<b>FIXED ASSETS</b>	4		
Tangible Assets		349984574.17	214815963.47
Intangible Assets		18765541.77	6722824.35
Capital Works-In-Progress		2826643844.62	2467195492.60
<b>INVESTMENTS FROM EARMARKED / ENDOWMENT FUNDS</b>	5		
Long Term			0.00
Short Term			0.00
<b>INVESTMENTS - OTHERS</b>	6	0.00	0.00
<b>CURRENT ASSETS</b>	7	1208728110.23	1480075659.13
<b>LOANS, ADVANCES &amp; DEPOSITS</b>	8	37173276.93	24953445.03
<b>TOTAL</b>		<b>4441295347.72</b>	<b>4193763384.58</b>
SIGNIFICANT ACCOUNTING POLICIES	23		
CONTINGENT LIABILITIES AND NOTES TO ACCOUNTS	24		

For NIT Meghalaya

Director

Registrar

Assistant Registrar

## National Institute of Technology, Meghalaya

### Income and Expenditure Account for the Year Ended 31st March 2022

[Amount in ₹]

Particulars	Schedule	Current Year	Previous Year
<b>INCOME</b>			
Academic Receipts	9	42438111.50	22610958.50
Grants / Subsidies	10	441457028.59	370574698.14
Income from investments	11	42771181.00	29181245.00
Interest earned	12	2086509.00	252780.00
Other Income	13	14128596.00	10792244.68
Prior Period Income	14	1280970.28	987673.00
<b>TOTAL (A)</b>		<b>544162396.37</b>	<b>434399599.32</b>
<b>EXPENDITURE</b>			
Staff Payments & Benefits (Establishment expenses)	15	247300432.00	197727700.92
Academic Expenses	16	45566401.74	44005643.00
Administrative and General Expenses	17	77061166.40	55826753.00
Transportation Expenses	18	4893826.00	4131842.00
Repairs & Maintenance	19	64971228.00	67647946.00
Finance costs	20	59578.45	23117.66
Depreciation	4	50759578.86	55927220.56
Other Expenses	21	0.00	0.00
Prior Period Expenses	22	1604396.00	1211695.56
<b>TOTAL (B)</b>		<b>492216607.45</b>	<b>426501918.70</b>
Balance being excess of Income over Expenditure (A-B)		51945788.92	7897680.62
Transfer to / from Designated Fund			
Building fund			
Others (specify)			
Balance Being Surplus / (Deficit) Carried to Capital Fund		51945788.92	7897680.62
Significant Accounting Policies	23		
Contingent Liabilities and Notes to Accounts	24		

For NIT Meghalaya

Director

Registrar

Assistant Registrar

## National Institute of Technology, Meghalaya

### SCHEDULE 1 : Corpus / Capital Fund

[Amount in ₹]

	Particulars	Current Year	Previous Year
	Balance at the beginning of the year	2699003378.62	2155209032.00
Add:	Contributions towards Corpus/Capital Fund	0.00	0.00
Add:	Adjustments of Previous years	0.00	7392764.00
Add:	Grants from UGC, Government of India and State Government to the extent utilized for capital expenditure	614464369.00	528503902.00
Add:	Assets Purchased out of IRG		0.00
Add:	Assets Purchased out of Sponsored Projects, where ownership vests in the institution	0.00	0.00
Add:	Assets Donated/Gifts Received	0.00	0.00
Add:	Depreciation for prior period	0.00	0.00
Add:	Excess of Income over expenditure transferred from the Income & Expenditure Account	51945788.92	7897680.62
(Deduct)	B/F Unutilized Grant transferred to Current Liabilities	0.00	0.00
	<b>Total</b>	<b>3365413536.54</b>	<b>2699003378.62</b>
(Deduct)	Deficit transferred from the Income & expenditure Account	0.00	0.00
	Balance at the year end	3365413536.54	2699003378.62

## National Institute of Technology, Meghalaya

### SCHEDULE 2 : Designated / Earmarked / Endowment Funds

Particulars	Fund wise Breakup		Total Current Year (A1+A2)	Fund wise Breakup		Total Previous Year (A1+A2)
	Internal Resources Fund A1	Corpus Fund A2		Internal Resources Fund A1	Corpus Fund A2	
<b>A.</b>						
a) Opening balance	94017762.00	20022076.00	114039838.00	94017762.00	7068276.00	101086038.00
b) Additions during the year	0.00	1692749.00	1692749.00	0.00	9607412.00	9607412.00
c) Income from investments made of the funds	0.00	3429266.00	3429266.00	0.00	3346388.00	3346388.00
d) Accrued Interest on investments/ Advances	0.00	0.00	0.00	0.00	0.00	0.00
e) Interest on Savings Bank a/c	0.00	0.00	0.00	0.00	0.00	0.00
f) Other additions (Specify nature)	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total (A)</b>	<b>94017762.00</b>	<b>25144091.00</b>	<b>119161853.00</b>	<b>94017762.00</b>	<b>20022076.00</b>	<b>114039838.00</b>
<b>B. Utilisation/Expenditure towards objectives of funds</b>						
i) Capital Expenditure	0.00	0.00	0.00	0.00	0.00	0.00
ii) Revenue Expenditure	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total (B)</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Closing balance at the year end (A - B)	94017762.00	25144091.00	119161853.00	94017762.00	20022076.00	114039838.00

## National Institute of Technology, Meghalaya

### SCHEDULE 3 : Current Liabilities & Provisions

[Amount in ₹]

Particulars	Current Year	Previous Year
<b>A. CURRENT LIABILITIES</b>		
1. Deposits from staff	7641506.25	2874568.25
2. Deposits from students	21827319.00	12191408.50
3. Sundry Creditors	0.00	0.00
a) For Goods & Services	0.00	0.00
b) Others	0.00	0.00
4. Deposit-Others (including EMD, Security Deposit) (As per Annexure 'A')	15225801.05	11950784.05
5. Statutory Liabilities (GPF, TDS, WC TAX, CPF, GIS, NPS): (As per Annexure 'B')		
a) Overdue	0.00	0.00
b) Others	6272641.78	2519769.25
6. Other Current Liabilities		
a) Salaries	0.00	0.00
b) Receipts against sponsored projects (As Per Annexure 3a)	65532431.26	56905642.60
c) Receipts against sponsored fellowships & scholarships	2632430.00	2868930.00
d) Unutilised Grants (As Per Annexure 3c)	727416839.67	1110161182.86
e) Grants in advance	0.00	0.00
f) Other funds	3802456.00	2402456.00
g) Other liabilities (As per Annexure 'C')	53305618.17	126060775.45
<b>Total (A)</b>	<b>903657043.18</b>	<b>1327935516.96</b>
<b>B. PROVISIONS</b>		
1. For Taxation	0.00	0.00
2. Gratuity	11999294.00	14925279.00
3. Superannuation Pension	0.00	0.00
4. Accumulated Leave Encashment	41063621.00	37859372.00
5. Trade Warranties/Claims	0.00	0.00
6. Others - Provision for Expenses	0.00	0.00
<b>Total (B)</b>	<b>53062915.00</b>	<b>52784651.00</b>
<b>Total (A+ B)</b>	<b>956719958.18</b>	<b>1380720167.96</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 3(a) : Sponsored Projects

Sl. No.	Name of Project	Opening Balance		Receipts / Recoveries during the year	Total	Expenditure during the year	Closing Balance	
		Credit	Debit				Credit	Debit
1	2	3	4	5	6	7	8	9
1	NIT R&D Account	51092838.15	0.00	41878994.00	92971832.15	28039603.38	64932228.77	0.00
2	Sponsored Project/NMHS-PMU/Vipin	113553.30	0.00	0.00	113553.30	107931.76	5621.54	0.00
3	Sponsored Project - CE/02 (Khwirakpam)	6378.50	0.00	161.00	6539.50		6539.50	0.00
4	PHD-Visvesvaraya	315256.59	0.00	173355.00	488611.59	286642.00	201969.59	0.00
5	Sponsored Project/Chem/Pareh	0.00	-472.36	354.00	826.36	24.00		802.36
6	Sponsored Project/DeITY/K. Datta	1207.00	0.00	31.00	1238.00	0.00	1238.00	0.00
7	Sponsored Project/SMDP/Dandapat	2734015.00	0.00	432814.00	3166829.00	3137642.00	29187.00	0.00
8	RECPTL	2642866.42	0.00	63797.00	2706663.42	2449279.29	257384.13	0.00
9	Sponsored Project/Gitish K Dutta		0.00	97318.98	97318.98	0.00	97318.98	0.00
10	Sponsored Project/Rajarshi Ray		0.00	943.75	943.75	0.00	943.75	0.00
	<b>Total</b>	<b>56906114.96</b>	<b>-472.36</b>	<b>42647768.73</b>	<b>99554356.05</b>	<b>34021122.43</b>	<b>65532431.26</b>	<b>802.36</b>

**Notes:**

- The Projects may be listed agency-wise, with sub-totals for each agency.
- The total of Col. 8 (Credit) will appear under the above head on the liabilities side of the Balance Sheet (Schedule 3).
- The total of Col. 9 (Debit) will appear as Receivables in Schedule 8, Loans, Advances and Deposits, on the Assets side of the Balance Sheet.

### SCHEDULE 3(b) : Sponsored Fellowships and Scholarships

Sl No.	Name of Sponsor	Opening Balance		Transactions during the year		Closing Balance	
		Credit	Debit	Credit	Debit	Credit	Debit
1	2	3	4	5	6	7	8
1	Scholarship - Top Class	1789769.00	0.00	0.00	0.00	1789769.00	0.00
2	External Individual Scholarships	1079161.00	0.00	228600.00	465100.00	842661.00	0.00
	<b>Total</b>	<b>2868930.00</b>	<b>0.00</b>	<b>228600.00</b>	<b>465100.00</b>	<b>2632430.00</b>	<b>0.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 3(c) : Unutilized Grants from UGC, Government of India and State Governments

[Amount in ₹]

Particulars	Current Year	Previous Year
<b>A Recurring Grants: Government of India</b>		
Balance B/F	82243170.47	48730148.69
Add: Receipts during the year	191793000.00	224300000.00
<b>Total (a)</b>	<b>274036170.47</b>	<b>273030148.69</b>
Less: Refunds	1793166.60	0.00
Less: Utilized for Revenue Expenditure	216547861.59	190786978.22
Less: Utilized for Capital Expenditure	0.00	0.00
<b>Total (b)</b>	<b>218341028.19</b>	<b>190786978.22</b>
<b>Unutilized carried forward (a-b)</b>	55695142.28	82243170.47
<b>B Capital Grants: Government of India</b>		
Balance B/F	1010559372.06	1001263274.06
Add: Receipts during the year	302200000.00	537800000.00
<b>Total (a)</b>	<b>1312759372.06</b>	<b>1539063274.06</b>
Less: Refunds	41647353.00	0.00
Less: Utilized for Revenue Expenditure	0.00	0.00
Less: Utilized for Capital Expenditure	614464369.00	528503902.00
<b>Total (b)</b>	<b>656111722.00</b>	<b>528503902.00</b>
<b>Unutilized carried forward (a-b)</b>	656647650.06	1010559372.06
<b>C Salary Grants: Government of India</b>		
Balance B/F	17358640.33	57967360.25
Add: Receipts during the year	235361000.00	139179000.00
<b>Total (a)</b>	<b>252719640.33</b>	<b>197146360.25</b>
Less: Refunds	12736426.00	0.00
Less: Utilized for Revenue Expenditure	224909167.00	179787719.92
Less: Utilized for Capital Expenditure	0.00	0.00
<b>Total (b)</b>	<b>237645593.00</b>	<b>179787719.92</b>
<b>Unutilized carried forward (a-b)</b>	15074047.33	17358640.33
<b>Grand Total (A+B+C+D)</b>	<b>727416839.67</b>	<b>1110161182.86</b>

#### Capital Grant :

Additions made to respective assets via adjustments/credits to CWIP have not been considered as grant utilisation since net additions made to CWIP have been considered as utilisation of grant already.

#### Recurring Grant :

Employer's share towards NPS has been added to Recurring Grant as per budget given by Ministry.

#### Salary Grant:

Employer's share towards NPS has been subtracted from Salary Grant as per budget given by Ministry. Expenses have been taken after reduction of credits made to respective heads.

## National Institute of Technology, Meghalaya

### SCHEDULE 4 : Fixed Assets

S. No.	Assets Heads	Gross Block				Depreciation				Net Block		
		Opening Balance	Additions	Adjustment	Prior Period Adjustments	Net Addition	Closing Balance	Prior Period Depreciation	Depreciation for the Year	Deductions/Adjustment	Closing Balance	Balance as on 31.03.2021
1	Land	2000000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2000000.00	2000000.00
2	Site Development	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Buildings	2315500.00	0.00	12850860.00	0.00	12850860.00	1386930.00	719327.20	0.00	2106257.20	33861002.80	21728570.00
4	Roads & Bridges	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Tube-wells & Water Supply	446375.00	0.00	0.00	0.00	446375.00	53566.00	8928.00	0.00	62494.00	363881.00	392809.00
6	Sewerage & Drainage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Electrical Installation and equipment	13676517.00	1372310.00	496095.00	0.00	1868405.00	1975076.00	777246.00	0.00	2752322.00	12792600.00	1170141.00
8	Plant & Machinery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	Scientific & Laboratory Equipment	19954171.00	132653331.00	0.00	0.00	132653331.00	76586093.00	26575603.00	0.00	103161696.00	229033346.00	122955618.00
10	Office Equipment	58506987.00	914240.00	0.00	0.00	914240.00	34453780.90	5073942.00	0.00	39527622.90	28123604.00	24053206.00
11	Audio Visual Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Computers & Peripherals	8763203.00	21064056.00	0.00	0.00	21064056.00	87635201.80	421281.00	0.00	9184802.80	16851246.20	120
13	Furniture, Fixtures & Fittings	64954354.00	2725610.00	0.00	0.00	2725610.00	34229672.93	4892019.00	0.00	39121691.93	26105223.07	30724681.07
14	Vehicles	3243960.00	0.00	0.00	0.00	0.00	2084994.00	324396.00	0.00	2409390.00	834570.00	1158966.00
15	Library Books & Scientific Journals	8886404.00	0.00	0.00	0.00	0.00	8785732.90	100670.10	0.00	8886403.00	100	100671.10
16	Small Value Assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total (A)</b>	<b>462007011.00</b>	<b>164506498.00</b>	<b>13346955.00</b>	<b>0.00</b>	<b>17853453.00</b>	<b>63960464.00</b>	<b>247191047.53</b>	<b>0.00</b>	<b>42684842.30</b>	<b>289875895.83</b>	<b>349984574.17</b>	<b>214815963.47</b>
17	Capital Work in Progress (B)	2467195492.23	429840417.00	-70392065.00	0.00	559448352.00	28262643844.23	0.00	0.00	0.00	28262643844.60	2467195492.23
<b>Total (C)</b>	<b>144853494.00</b>	<b>2017454.00</b>	<b>0.00</b>	<b>0.00</b>	<b>2017454.00</b>	<b>164970948.00</b>	<b>138130670.11</b>	<b>0.00</b>	<b>8074736.56</b>	<b>146205406.67</b>	<b>1876554177</b>	<b>6722823.89</b>
<b>Grand Total (A+B+C)</b>	<b>3074055997.23</b>	<b>614464369.00</b>	<b>-5704510.00</b>	<b>0.00</b>	<b>557419259.00</b>	<b>3631475256.23</b>	<b>3853271764</b>	<b>0.00</b>	<b>50759578.86</b>	<b>43601296.50</b>	<b>3195393960.54</b>	<b>2688734279.59</b>
18	Intangible Assets	71802803.00	5740506.00	0.00	0.00	5740506.00	71802803.00	2296202.00	0.00	74099004.00	344305.00	100
19	Computer Software	72800891.00	14376948.00	0.00	0.00	14376948.00	66272570.00	5750779.00	0.00	72023136.00	15154703.00	6528534.00
20	E-Journals	249800.00	0.00	0.00	0.00	0.00	555111	2775.56	0.00	83266.67	166533.33	192288.89
<b>Total (C)</b>	<b>144853494.00</b>	<b>2017454.00</b>	<b>0.00</b>	<b>0.00</b>	<b>2017454.00</b>	<b>164970948.00</b>	<b>138130670.11</b>	<b>0.00</b>	<b>8074736.56</b>	<b>146205406.67</b>	<b>1876554177</b>	<b>6722823.89</b>
<b>Grand Total (A+B+C)</b>	<b>3074055997.23</b>	<b>614464369.00</b>	<b>-5704510.00</b>	<b>0.00</b>	<b>557419259.00</b>	<b>3631475256.23</b>	<b>3853271764</b>	<b>0.00</b>	<b>50759578.86</b>	<b>43601296.50</b>	<b>3195393960.54</b>	<b>2688734279.59</b>

Note: The figure in Column "Deductions" under Gross Block against the head Capital Work in Progress represents the transfer from Work in Progress to Assets during the year. The figures in column "Additions during the year under Gross Block against Assets 1 to 14 include transfer from Work in Progress during the year, as well as further acquisitions during the year.

## National Institute of Technology, Meghalaya

### SCHEDULE 5 : Investments from Earmarked / Endowment Funds

[Amount in ₹]

		Current Year	Previous Year
1	In Central Government Securities	0.00	0.00
2	In State Government Securities	0.00	0.00
3	Other approved Securities	0.00	0.00
4	Shares	0.00	0.00
5	Debentures and Bonds	0.00	0.00
6	Term Deposits with Banks	0.00	0.00
7	Others (to be specified)	0.00	0.00
	<b>Total</b>	<b>0.00</b>	<b>0.00</b>

### SCHEDULE 6 : Investments — Others

[Amount in ₹]

		Current Year	Previous Year
1	In Central Government Securities	0.00	0.00
2	In State Government Securities	0.00	0.00
3	Other approved Securities	0.00	0.00
4	Shares	0.00	0.00
5	Debentures and Bonds	0.00	0.00
6	Others	0.00	0.00
	<b>Total</b>	<b>0.00</b>	<b>0.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 7 : Current Assets

[Amount in ₹]

	Current Year	Previous Year
<b>1. Stock:</b>		
a) Stores and Spares	0.00	0.00
b) Loose Tools	0.00	0.00
c) Publications	0.00	0.00
d) Laboratory chemicals, consumables and glass ware	0.00	0.00
e) Building Material	0.00	0.00
f) Electrical Material	0.00	0.00
g) Stationery	0.00	0.00
h) Water supply material	0.00	0.00
<b>2. Sundry Debtors:</b>		
a) Debts Outstanding for a period exceeding six months	0.00	0.00
b) Others	0.00	0.00
<b>3. Cash and Bank Balances</b>		
a) With Scheduled Banks:		
In Current Accounts	117863545.16	122280855.11
In term deposit Accounts	778858241.00	1023848616.00
In Savings Accounts	312006324.07	333946188.02
b) With non-Scheduled Banks:		
In term deposit Accounts	0.00	0.00
In Savings Accounts	0.00	0.00
c) Cash in hand:	0.00	0.00
<b>4. Post Office- Savings Accounts</b>	0.00	0.00
<b>TOTAL</b>	<b>1208728110.23</b>	<b>1480075659.13</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 8 : Loans, Advances & Deposits

[Amount in ₹]

	Current Year	Previous Year
<b>1. Advances to employees: (Non-interest bearing)</b>		
a) Salary	0.00	0.00
b) Festival	0.00	0.00
c) Medical Advance	0.00	0.00
d) Other - PDA Advance	134638.93	571802.93
e) Other - LTC Advance	100700.00	17000.00
<b>2. Long Term Advances to employees: (Interest bearing)</b>		
a) Vehicle loan	0.00	0.00
b) Home loan	0.00	0.00
c) Others (to be specified)	0.00	0.00
<b>3. Advances and other amounts recoverable in cash or in kind or for value to be received:</b>		
a) On Capital Account	16432340.64	13321052.10
b) To Suppliers	0.00	0.00
c) Others - Travelling Advance	0.00	0.00
d) Others - Temporary Advance	0.00	0.00
e) Advance against Rent	0.00	0.00
f) Advance against Projects	0.00	0.00
<b>4. Prepaid Expenses</b>		
a) Repairs and Maintenance	5557967.00	0.00
b) Other expenses -Leased Line Charges	198540.00	198540.00
c) Rent	2583846.00	0.00
<b>5. Deposits</b>		
a) Telephone	0.00	0.00
b) Lease Rent	0.00	0.00
c) Electricity	0.00	0.00

## National Institute of Technology, Meghalaya

### SCHEDULE 8 : Loans, Advances & Deposits (Contd...)

[Amount in ₹]

	Current Year	Previous Year
d) AICTE, if applicable	0.00	0.00
e) Others	3506122.00	2779947.00
<b>6. Income Accrued:</b>		
a) On Investments from Earmarked/ Endowment Funds	0.00	0.00
b) On Investments-Others	0.00	0.00
c) On Loans and Advances	0.00	0.00
d) Others (includes income due unrealized) (Term Deposits)	6040126.00	5592909.00
<b>7. Other - Current assets receivable from UGC/sponsored projects</b>		
a) Debit balances in Sponsored Projects	802.36	0.00
b) Debit balances in Sponsored Fellowships & Scholarships	0.00	0.00
c) Grants Receivable	0.00	0.00
d) Other receivables from UGC	0.00	0.00
e) Caution Money - B Tech	9000.00	9000.00
f) CCMT 2017	300.00	300.00
g) CCMT Admission Expenses 2016	25361.00	25361.00
h) CSAB Refund	146000.00	0.00
<b>8. Claims Receivable</b>		0.00
Sundry Receivables	2437533.00	2437533.00
<b>TOTAL</b>	<b>37173276.93</b>	<b>24953445.03</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 9 : Academic Receipts

[Amount in ₹]

	Current Year	Previous Year	
<b>A. FEES FROM STUDENTS</b>			
<b>A. Academic</b>			
1	Enrollment and Registration Fee	1568200.00	1100400.00
2	Application Fee	1336503.00	97652.00
3	Summer Term Course Fee	56000.00	88000.00
4	Laboratory and Internet Fee	4371500.00	3428000.00
5	Library Fee	1811100.00	838200.00
6	Provisional Certificate Fee	349000.00	222900.00
7	Student Activity Fee	3402500.00	2609500.00
8	International Student Fee	2627000.00	0.00
9	CCMT/CSAB Fee	0.00	3614200.00
10	Tuition Fees	22916608.50	7762822.50
	<b>Total (A)</b>	<b>38438411.50</b>	<b>19761674.50</b>
<b>B. Examinations</b>			
1	Examination Fee and Grade Fee	1922850.00	1447134.00
	<b>Total (B)</b>	<b>1922850.00</b>	<b>1447134.00</b>
<b>C. Other Fees</b>			
1	Identity Card Fee	52350.00	34650.00
2	Hostel Admission Fee	33000.00	20000.00
3	Fine	164000.00	42000.00
4	Transportation Fee	1677500.00	1155500.00
5	Thesis Submission Fee	150000.00	150000.00
	<b>Total (C)</b>	<b>2076850.00</b>	<b>1402150.00</b>
<b>D. Sale of Publications</b>			
1.	Sale of Admission forms	0.00	0.00
2.	Sale of syllabus and Question Paper, etc.	0.00	0.00
3.	Sale of prospectus including admission forms	0.00	0.00
	<b>Total (D)</b>	<b>0.00</b>	<b>0.00</b>
<b>E. Other Academic Receipts</b>			
1.	Registration fee for workshops, programmes	0.00	0.00
2.	Registration fees (Academic Staff College)	0.00	0.00
	<b>Total (E)</b>	<b>0.00</b>	<b>0.00</b>
	<b>Grand Total (A+B+C+D+E)</b>	<b>42438111.50</b>	<b>22610958.50</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 10 : Grants / Subsidies (Irrevocable Grants Received)

Particulars	Recurring		Capital		Total	Salary		Previous Year Total
	Govt. of India	Govt. of India	Govt. of India	Govt. of India		Govt. of India	Govt. of India	
Balance B/F	82243170.47	17358640.33	1010559372.06	235361000.00	1110161182.86	48730148.69	57967360.25	1107960783.00
Add: Receipts during the year	191793000.00	252719640.33	302200000.00	273030148.69	729354000.00	224300000.00	139179000.00	901279000.00
Total	274036170.47	12736426.00	1312759372.06	56176945.60	1839515182.86	273030148.69	197146360.25	2009239783.00
Less: Refund to UGC Balance	179316660	0.00	41647353.00	614464369.00	56176945.60	0.00	0.00	0.00
Less: Utilised for Capital expenditure (A)	0.00	0.00	614464369.00	0.00	614464369.00	0.00	0.00	528503902.00
Balance	272243003.87	239983214.33	656647650.06	224909167.00	1168873868.26	273030148.69	197146360.25	1480735881.00
Less: Utilized for Revenue Expenditure (B)- Amount transferred to Income & Expenditure Account	216547861.59	0.00	0.00	441457028.59	441457028.59	190786978.22	0.00	370574698.14
Balance C/F (C)	55695142.28	15074047.33	656647650.06	727416839.67	727416839.67	82243170.47	17358640.33	1110161182.86

A- Appears as addition to Corpus/Capital Fund (Schedule-1)as well as additions to Fixed Assets during the year.

B- Appears as income in the Income &amp; Expenditure Account.

C- (i) Appears under Current Liabilities-Unspent Grant in the Balance Sheet and will become the opening balance next year (Schedule 3).

(ii) Represented by Bank balances, Investments and Advances on the assets side.

## National Institute of Technology, Meghalaya

### SCHEDULE 11 : Income from Investments

[Amount in ₹]

Particulars	Earmarked / Endowment Funds		Other Investments	
	Current Year	Previous Year	Current Year	Previous Year
1. Interest				
a. On Government Securities	0.00	0.00	0.00	0.00
b. Other Bonds/Debentures	0.00	0.00	0.00	0.00
2. Interest on Term Deposits	0.00	0.00	42771181.00	29181245.00
3. Income accrued but not due on Term Deposits/Interest bearing advances to employees	0.00	0.00		0.00
4. Interest on Savings Bank Accounts	0.00	0.00	0.00	0.00
5. Others (Specify)	0.00	0.00	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>42771181.00</b>	<b>29181245.00</b>
<b>Transferred to Earmarked/Endowment Funds</b>	<b>0.00</b>	<b>0.00</b>		
<b>Balance</b>	<b>0.00</b>	<b>0.00</b>		

### SCHEDULE 12 : Interest Earned

[Amount in ₹]

Particulars	Current Year	Previous Year
1. On Savings Accounts with scheduled banks	2086509.00	252780.00
2. On Loans		
a. Employees/Staff	0.00	0.00
b. Others	0.00	0.00
3. On Debtors and Other Receivables	0.00	0.00
<b>Total</b>	<b>2086509.00</b>	<b>252780.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 13 : Other Income

[Amount in ₹]

	Current Year	Previous Year
<b>A. Income from Land &amp; Buildings</b>	Current Year	Previous Year
1. Hostel Seat Rent	8352729.00	6717800.00
2. License fee	0.00	0.00
3. Hostel Electricity and Water Charges	1955500.00	1609000.00
4. Hostel Establishment Fee	3097500.00	2439000.00
<b>Total</b>	<b>13405729.00</b>	<b>10765800.00</b>
<b>B. Sale of Institute's publications</b>	0.00	0.00
<b>C. Income from holding events</b>		
1. Gross Receipts from annual function/ sports carnival	0.00	0.00
Less: Direct expenditure incurred on the annual function/ sports carnival	0.00	0.00
2. Gross Receipts from fetes	0.00	0.00
Less: Direct expenditure incurred on the fetes	0.00	0.00
3. Gross Receipts for educational tours	0.00	0.00
Less: Direct expenditure incurred on the tours	0.00	0.00
4. Overhead Charges	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>0.00</b>
<b>D. Others</b>		
1. Income from consultancy		0.00
2. RTI fees	558.00	108.00
3. Income from Royalty	0.00	0.00
4. Sale of application form (recruitment)	0.00	0.00
5. Misc. receipts (Sale of tender form)	0.00	0.00
6. Profit on Sale/disposal of Assets	0.00	0.00
a) Owned assets	0.00	0.00
b) Assets received free of cost	0.00	0.00
7. Grants/Donations from Institutions, Welfare Bodies and International Organizations"	0.00	0.00
8. Others		
a) Miscellaneous	451669.00	26336.68
b) External Scholarship	270640.00	0.00
c) Liquidated Damages	0.00	0.00
<b>Total</b>	<b>722867.00</b>	<b>26444.68</b>
<b>Grand Total (A+B+C+D)</b>	<b>14128596.00</b>	<b>10792244.68</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 14 : Prior Period Income

[Amount in ₹]

	Particulars	Current Year	Previous Year
1	Academic Receipts	0.00	78000.00
2	Remuneration	42000.00	0.00
3	Interest earned	908023.00	909673.00
4	Other Income	330947.28	0.00
	<b>Total</b>	<b>1280970.28</b>	<b>987673.00</b>

### SCHEDULE 15 : Staff Payments & Benefits (Establishment Expenses)

[Amount in ₹]

	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
a) Salaries and Wages	217748440.00	0.00	217748440.00	172973147.00	0.00	172973147.00
b) Allowances and Bonus	2054422.00	0.00	2054422.00	1258225.00	0.00	1258225.00
c) Contribution to Provident Fund		0.00	0.00	0.00	0.00	0.00
d) Contribution to Other Fund (specify)		0.00	0.00	0.00	0.00	0.00
e) Staff Welfare Expenses		0.00	0.00	0.00	0.00	0.00
f) Retirement and Terminal Benefits	26100194.00	0.00	26100194.00	21617011.00	0.00	21617011.00
g) LTC facility	1307606.00	0.00	1307606.00	5814259.00	0.00	5814259.00
h) Medical facility	0.00	0.00	0.00		0.00	0.00
i) Children Education Allowance		0.00	0.00	0.00	0.00	0.00
j) Honorarium	139000.00	0.00	139000.00	766357.92	0.00	766357.92
k) Gratuity (Provision)	-2925985.00	0.00	-2925985.00	-6642925.00	0.00	-6642925.00
l) Others - Medical Expenses	2876755.00	0.00	2876755.00	1941626.00	0.00	1941626.00
<b>TOTAL</b>	<b>247300432.00</b>	<b>0.00</b>	<b>247300432.00</b>	<b>197727700.92</b>	<b>0.00</b>	<b>197727700.92</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 16 : Academic Expenses

[Amount in ₹]

	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
a) Laboratory expenses		0.00	0.00	0.00	0.00	0.00
b) Field work/ Participation in Conferences		0.00	0.00	0.00	0.00	0.00
c) Expenses on Seminars/ Workshops	56500.00	0.00	56500.00	24781.00	0.00	24781.00
d) Honararium (Foreign Examiners)	490994.28	0.00	490994.28	0.00	0.00	0.00
e) Examination		0.00	0.00	0.00	0.00	0.00
f) Student Welfare expenses		0.00	0.00	0.00	0.00	0.00
g) Admission expenses		0.00	0.00	0.00	0.00	0.00
h) Convocation expenses	852478.00	0.00	852478.00	788054.00	0.00	788054.00
i) Publications		0.00	0.00	0.00	0.00	0.00
j) Stipend/means-cum-merit scholarship	41793282.00	0.00	41793282.00	41596916.00	0.00	41596916.00
k) Subscription Expenses		0.00	0.00	0.00	0.00	0.00
l) Others						
i) Recurring Contingency	961900.00	0.00	961900.00	52219.00	0.00	52219.00
ii) Students Activities	497708.46	0.00	497708.46	510215.00	0.00	510215.00
iii) Other Academic Activities		0.00	0.00	103744.00	0.00	103744.00
iv) Consumables	642000.00	0.00	642000.00	807548.00	0.00	807548.00
v) Startup Project		0.00	0.00	45379.00	0.00	45379.00
vi) Medical Expenses - Students	271539.00	0.00	271539.00	76787.00	0.00	76787.00
<b>TOTAL</b>	<b>45566401.74</b>	<b>0.00</b>	<b>45566401.74</b>	<b>44005643.00</b>	<b>0.00</b>	<b>44005643.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 17 : Administrative and General Expenses

[Amount in ₹]

	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
<b>A. Infrastructure</b>						
a) Electricity and power	4367823.00	0.00	4367823.00	4566665.00	0.00	4566665.00
b) Water charges	1398680.00	0.00	1398680.00	803240.00	0.00	803240.00
c) Insurance	0.00	0.00	0.00	0.00	0.00	0.00
d) Rent, Rates and Taxes (including property tax)	59033508.00	0.00	59033508.00	44820468.00	0.00	44820468.00
<b>Total (A)</b>	<b>64800011.00</b>	<b>0.00</b>	<b>64800011.00</b>	<b>50190373.00</b>	<b>0.00</b>	<b>50190373.00</b>
<b>B. Communication</b>						
e) Communication and Transportation	2170816.40	0.00	2170816.40	1981415.00	0.00	1981415.00
f) Telephone, Fax and Internet Charges	321122.00	0.00	321122.00	603575.00	0.00	603575.00
<b>Total (B)</b>	<b>2491938.40</b>	<b>0.00</b>	<b>2491938.40</b>	<b>2584990.00</b>	<b>0.00</b>	<b>2584990.00</b>
<b>C. Others</b>						
g) Printing and Stationery (consumption)	163800.00	0.00	163800.00	534596.00	0.00	534596.00
h) Travelling and Conveyance Expenses/ TA/DA	541719.00	0.00	541719.00	214240.00	0.00	214240.00
i) Meeting Expenses	577970.00	0.00	577970.00	151285.00	0.00	151285.00
j) Auditors Remuneration	0.00	0.00	0.00	382500.00	0.00	382500.00
k) Professional Charges	492451.00	0.00	492451.00	385718.00	0.00	385718.00
l) Advertisement and Publicity	1488072.00	0.00	1488072.00	286827.00	0.00	286827.00
m) Magazines & Journals	0.00	0.00	0.00	1724.00	0.00	1724.00
n) Others (as per details below)						
Contingencies	159852.00	0.00	159852.00	292050.00	0.00	292050.00
Recruitment Expenses	614692.00	0.00	614692.00	10736.00	0.00	10736.00
Miscellaneous Expenses	471378.00	0.00	471378.00	269590.00	0.00	269590.00
Institute Day expenses (Annual Day)	648061.00	0.00	648061.00	24500.00	0.00	24500.00
Recurring expenses for Departments	4500284.00	0.00	4500284.00	458625.00	0.00	458625.00
Postage and Telegram	2148.00	0.00	2148.00	0.00	0.00	0.00
Patent Administration Charges	108790.00	0.00	108790.00			0.00
Institute Overhead			0.00	38999.00	0.00	38999.00
<b>Total (C)</b>	<b>9769217.00</b>	<b>0.00</b>	<b>9769217.00</b>	<b>3051390.00</b>	<b>0.00</b>	<b>3051390.00</b>
	0.00	0.00	0.00	0.00	0.00	0.00
<b>TOTAL (A+B+C)</b>	<b>77061166.40</b>	<b>0.00</b>	<b>77061166.40</b>	<b>55826753.00</b>	<b>0.00</b>	<b>55826753.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 18 : Transportation Expenses

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
Vehicles (owned by Institution)						
a)Running expenses	173294.00	0.00	173294.00	125063.00	0.00	125063.00
b)Repairs & maintenance		0.00	0.00		0.00	0.00
c) Insurance expenses		0.00	0.00		0.00	0.00
Vehicles taken on rent/lease						
a) Rent/lease expenses	4720532.00	0.00	4720532.00	4006779.00	0.00	4006779.00
Vehicle (Taxi) hiring expenses		0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>4893826.00</b>	<b>0.00</b>	<b>4893826.00</b>	<b>4131842.00</b>	<b>0.00</b>	<b>4131842.00</b>

### SCHEDULE 19 : Repairs & Maintenance

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
a) Buildings	0.00	0.00	0.00	0.00	0.00	0.00
b) Furniture & Fixtures	0.00	0.00	0.00	0.00	0.00	0.00
c) Plant & Machinery	0.00	0.00	0.00	0.00	0.00	0.00
d) Office Equipment	0.00	0.00	0.00	0.00	0.00	0.00
e) Computers	0.00	0.00	0.00	0.00	0.00	0.00
f) Laboratory & Scientific equipment	0.00	0.00	0.00	0.00	0.00	0.00
g) Audio Visual equipment	0.00	0.00	0.00	0.00	0.00	0.00
h) Cleaning Material & Services	0.00	0.00	0.00	0.00	0.00	0.00
i) Book binding charges	0.00	0.00	0.00	0.00	0.00	0.00
j) Gardening	0.00	0.00	0.00	0.00	0.00	0.00
k) Estate Maintenance	0.00	0.00	0.00	0.00	0.00	0.00
l) Others - Security and Cleaning	60585342.00	0.00	60585342.00	57011253.00	0.00	57011253.00
m) Others - Repairs and Maintenance	4385886.00	0.00	4385886.00	10636693.00	0.00	10636693.00
<b>Total</b>	<b>64971228.00</b>	<b>0.00</b>	<b>64971228.00</b>	<b>67647946.00</b>	<b>0.00</b>	<b>67647946.00</b>

## National Institute of Technology, Meghalaya

### SCHEDULE 20 : Finance Costs

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
a) Bank charges	59578.45	0.00	59578.45	23117.66	0.00	23117.66
b) Others (specify)	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>59578.45</b>	<b>0.00</b>	<b>59578.45</b>	<b>23117.66</b>	<b>0.00</b>	<b>23117.66</b>

### SCHEDULE 21 : Other Expenses

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
a) Provision for Bad and Doubtful Debts/Advances	0.00	0.00	0.00	0.00	0.00	0.00
b) Irrecoverable Balances Written - off	0.00	0.00	0.00	0.00	0.00	0.00
c) Grants/Subsidies to other institutions/organizations	0.00	0.00	0.00	0.00	0.00	0.00
d) Others (specify)	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### SCHEDULE 22 : Prior Period Expenses

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Revenue	Capital	Total	Revenue	Capital	Total
PDA expenses	431165.00	0.00	431165.00	0.00	0.00	0.00
Salary expenses	610656.00	0.00	610656.00	0.00	0.00	0.00
Administrative expenses		0.00	0.00	256920.00	0.00	256920.00
Transportation expenses		0.00	0.00	0.00	0.00	0.00
Repairs & Maintenance		0.00	0.00	0.00	0.00	0.00
Communication and Transport	562575.00	0.00	562575.00	0.00	0.00	0.00
Depreciation- As per Schedule 4	0.00	0.00	0.00	2400.00	0.00	954775.56
<b>Total</b>	<b>1604396.00</b>	<b>0.00</b>	<b>1604396.00</b>	<b>259320.00</b>	<b>0.00</b>	<b>1211695.56</b>

## National Institute of Technology, Meghalaya

### ANNEXURE A : Details of EMD & Security Deposit as On 31-03-2022

S. No	Name of the Firm / Company	Amount
1	Earnest Money Deposit	4108815.00
2	PBG	88100.00
3	Security Deposit	11028886.05
	<b>Total</b>	<b>15225801.05</b>

### ANNEXURE B : Details of Statutory Liabilities as On 31-03-2022

Sl. No.	Particulars	Amount
1	TDS - Contracts	22557.48
2	VAT	27967.00
3	TDS - Pay and Allowances	2080622.00
4	TDS - GST	2904748.00
5	Professional Tax Payable	304600.00
6	Labour Cess	765565.00
7	GST	166582.30
	<b>Total</b>	<b>6272641.78</b>

### ANNEXURE C : Details of Other Liabilities as On 31-03-2022

Sl. No.	Particulars	Amount
1	Audit Remuneration Payable	664029.00
2	Book Purchase	3343645.00
3	CCMT / CSAB Admission Expenses	39873.00
4	CSAB Administrative Charges	465642.00
5	Electricity Charges Payable	433219.00
6	Excess Fee Refundable	907634.00
7	External Agency Funds- For exams, conference, seminar, etc.	580856.07
8	Hostel Mess Fees	9135223.00
9	NSDL Service Charges payable	20651.00
10	PDA Advance (2018-19)	400.00
11	Postage and Telegram payable	2148.00
12	Rent Payable	13972896.00
13	Returned Cheques	79369.10
14	Salary Payable	15395935.00
15	Security, Cleaning Charges Payable	5318070.00
16	Stale Cheques	812738.00
17	Sundry Receipts	202760.00
18	SVNIT Surat	124375.00
19	Telephone Expenses Payable	59275.00
20	Vehicle Hiring Charges payable	1510680.00
21	Temporary Advance (2016-17)	1440.00
22	Water Charges Payable	234760.00
	<b>Total</b>	<b>53305618.17</b>

## National Institute of Technology, Meghalaya

### ANNEXURE D : Details of Balances in Savings Bank / Current / Fixed Deposit Accounts With Banks as On 31-03-2022

[Amount in ₹]

Sl. No.	Particulars	Purpose	Account No.	Amount
	Current Bank Accounts			
1	Bank of India	Project	503010210000005	5621.54
2	State Bank of India	Main Account	32047142365	117857923.62
	<b>Total (A)</b>			<b>117863545.16</b>
	Savings Bank Accounts			
1	Canara Bank	General Account	1184101015456	8981907.00
2	ICICI Bank	NITM Fee (IRG)	332701000053	85095781.00
3	ICICI Bank	Corpus Fund	747701000081	94632819.00
4	State Bank of India	SBI Collect - Fees Collection	35711256956	33388200.32
5	State Bank of India	Hostel Mess Account	37768297245	7681278.95
6	State Bank of India	SBI FITI	40036592826	55734.00
7	State Bank of India	SBI Power Jyoti - Fees Collection	34973520929	429080.00
8	State Bank of India	Recruitment	38070817950	2578146.46
9	State Bank of India	Project and Consultancy	37935741794	29187.00
10	UCO Bank	Fees Account	23730110003381	13462805.88
11	UCO Bank	Project - Khwairakam	23730110013106	6539.50
12	UCO Bank	Project - Paresh	23730110015872	-802.36
13	UCO Bank	Project - K Dutta	23730110016640	1238.00
14	UCO Bank	Project- RECPTL	23730110019580	257384.13
15	UCO Bank	Project - Visvesvaraya	23730110015353	201969.69
16	UCO Bank	Research and Development	23730110010280	65052247.77
17	UCO Bank	Gitish K Dutta	23730110015209	11724.83
18	UCO Bank	Gitish K Dutta	23730110015889	85594.15
19	UCO Bank	Rajarshi Ray	23730110016657	943.75
20	Indian Overseas Bank	General Account	05410001042010	54545.00
	<b>Total (B)</b>			<b>312006324.07</b>
	Term Deposits			
1	UCO Bank			17116587.00
2	Canara Bank			234524159.00
3	ICICI Bank			356223001.00
4	Indian Overseas Bank			135775768.00
5	State Bank of India			35218726.00
	<b>Total (C)</b>			<b>778858241.00</b>
	<b>Total (A+B+C)</b>			<b>1208728110.23</b>

## National Institute of Technology, Meghalaya

### Receipts and Payments Account for the Year Ended 31st March 2022

Amount in Rupees

RECEIPTS		Current Year	Previous Year	PAYMENTS	
I.	Opening Balance			I.	Expenses
	a) Cash Balances		173706.00	a)	Staff Payments & Benefits
	b) Bank Balance			b)	Academic Expenses
	i. In Current accounts	122280855.11	397991659.30	c)	Administrative Expenses
	ii. In Deposit accounts	1023848616.00	108001726.27	d)	Transportation Expenses
	iii. Savings accounts	333946188.02	201080116.00	e)	Repairs & Maintenance
II.	Grants Received			f)	Prior period expenses
	a) From Government of India	729354000.00	901279000.00	g)	Finance Cost
	b) From State Government			II.	Payments against Earmarked/ Endowment Funds
	c) From others	98420482.35	71491685.18	III.	Payments against Sponsored Projects/Schemes
				IV.	Payments against Sponsored Fellowships/Scholarships
				V.	Investments and Deposits made
III.	Academic Receipts	75612245.00	64277623.00	a)	Out of Earmarked/ Endowments funds
IV.	Receipts against Earmarked/ Endowment Funds	3429266.00	12953800.00	b)	Out of own funds (Investments- Others)
V.	Receipts against Sponsored Projects/Schemes			VI.	Term Deposits with Scheduled Banks
VI.	Receipts against sponsored Fellowships and Scholarships			VII.	Expenditure on Fixed Assets and Capital Works - in- Progress
VII.	Income on Investments from			a)	Fixed Assets
	a) Earmarked/Endowment funds	0.00		b)	Capital Works- in- Progress
	b) Other investments			VIII.	Other Payments including statutory payments
VIII.	Interest received on				
	a) Bank Deposits	2086509.00	252780.00	IX.	Refunds of Grants
	b) Loans and Advances			X.	Deposits and Advances
	c) Savings Bank Accounts			XI.	Other Payments
	d) Term deposits	22831093.00	3309799.00		
IX.	Investments encashed	13959342.00	18933530.00	XII.	Closing balances
X.	Term Deposits with Scheduled Banks encashed			a)	Cash in hand
XI.	Other income (including Prior Period Income)	1701119.00	1185917.68	b)	Bank balances
XII.	Deposits and Advances	7818566.00	723034369.07	In Current Accounts	117863545.16
XIII.	Miscellaneous Receipts including Statutory Receipts	91.00		In Savings Accounts	312006324.07
XIV.	Any Other Receipts	6951674.20	6484738.00	In Deposit Accounts	778858241.00
XV.	Provisions		81572.00		1023848616.00
	<b>TOTAL</b>	<b>2442240046.68</b>	<b>2510532021.50</b>	<b>TOTAL</b>	<b>2442240046.68</b>
				<b>TOTAL</b>	<b>2510532021.50</b>





**National Institute of Technology, Meghalaya**  
Bijni Complex, Laitumkhrach, Shillong, Meghalaya 793003