



Annual Newsletter from Mechanical Engineering Department, Assam Engineering College, Jalukbari

# Yantrik Oyantrik

6<sup>th</sup> Edition [2021-22]

## যান্ত্ৰিক অযান্ত্ৰিক

ষষ্ঠম সংখ্যা (২০২১-২২)

## YANTRIK-OYANTRIK 2022

### HOD's message

#### Department of Mechanical Engineering, AEC



Happy New Year 2022, Dear Friends! Thank you for giving me the opportunity to appear before you again at the beginning of the New Year. The recent past has been a painful experience because our life took an unprecedented turn due to the onslaught of the pandemic which has taken us by surprise. Yet no fool-proof mechanism is in sight till date and for that reason, perhaps it may turn out to be the way for human life compelling us to learn to live with it until reliable and affordable alternative is made available for all. The future seems uncertain and long-term uncertainty is intimidating due to the fundamental reason that it affects the very process of our efforts with

insurmountable hindrances and complexities in achieving the desired goals. Life is not a bed of roses is well understood, and the present situation is a super-added predicament (according to un-paralleled Assamese proverbial saying “ভূতৰ ওপৰত দানহ” ).

It has been aptly said, “Time flies like feathered arrows” which was very well experienced during the past two years. The outcome of the efforts of our recent past may be successful; but I am afraid such results may not be effective in the long run. The online system of delivering lectures has been well tried, but what fruitful result it can fetch is doubtful in engineering education for an invisible audience in comparison to the impact of offline classes practiced from time immemorial. In professional courses like engineering, theories are based on many assumptions to simplify the subject matter for basic understanding and the subject matter becomes tougher when such assumptions are eliminated at higher level of thinking to approach the real world situation. Competitions are becoming tougher and jobs are few. As such offline hands-on experience, beyond the assimilation of theory, is all the more important for building independent and self-reliant engineers. Some online platforms managed the show by delivering the same through virtual means and for some, it has become lucrative business. There is no doubt that the prevailing situation was adverse and so the loss suffered by the students in gaining useful knowledge within or outside the institution is massive, despite the fact that the vigorous process of skill building and self-learning among the students and faculties had made only a beginning during the past few years as challenges in career is demanding at the present time.

Lately, a ray of hope is emerging due to relaxation of the strictures imposed. Even then the number of people, in advocating for online system of education and for making it a tradition, is not very few. The sooner we understand its drawback is the better.

The continuity has broken in our normal physical meetings due to the undesirable circumstances and the sword of Damocles is hanging over us all the time. With this new beginning, all kinds of dormant activities are to be revived and it is time to prove ourselves by following the motto ‘Service before Self’. I am hopeful all hands on deck can make it possible, despite temporary hitch, in our 65-year



voyage of Mechanical Engineering education as a stakeholder of the premier institution of the whole North East India.

On the other hand, it is not possible to forget the love of many of the ex-graduates of this department who unfailingly visit *Mechanical Engineering Department* and cherish their memory with family members strolling on the corridors of this department for the first time. It is really heart-warming for us to be members of an ever-growing Mechanical Engineering family. One of our ex-graduates and ex-faculty Late *Pratul Chandra Baruah* had a long association with this department and his family offered the prestigious “*Pratul Chandra Baruah Merit Award Scholarships*” for meritorious students of Mechanical Engineering that took its root in 2021. The matter of screening and selection is the responsibility of the department under the jurisdiction of an internal committee. The same is being continued for the year 2022 also.

At the end, I wish to thank all students, faculties, staff and well wishers who are relentlessly working for a better tomorrow and NBA accreditation, particularly *Dr. Plaban Kakoti*, Professor of Mechanical Engineering., who is continuing as Coordinator for this special purpose and delicate job. Few of our team mates have suffered and some are recovering from ailments. I believe strong mind and will power of our players shall make them tide over all difficulties.

The onus of the latest edition of *Yantrik-Oyantrik* is at the hands of *Dr. Manjuri Hazarika*, Professor of Mechanical Engineering, *Dr. Basab Jyoti Phukan*, Assoc. Professor of Mechanical Engineering and *Mr. Piyush Singh*, Assistant Professor of Mechanical Engineering. I have no words for thanking them enough for the job they have done so nicely.

Lastly, I wish to thank all of you again. The suggestions and constructive criticisms of the well wishers shall be accepted with all humility.

With regards,

Date: 25 January 2022



**(Dr. R. K. Dutta)**  
**Professor & H.O.D.**  
**Mechanical Engineering Department**  
**Assam Engineering College**  
**Jalukbari, Guwahati-13**

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## From the Editorial Desk

We, the members of the editorial team feel privileged and pleased to be entrusted with the responsibility of shaping the annual newsletter of Mechanical Engineering Department (MED), Assam Engineering College (AEC) for the year 2021-22. Mechanical Engineering Department, AEC standing tall since 1957 has been in relentless service to the society by producing competent mechanical engineers capable of contributing towards development of the nation. The immense contribution of MED towards building technical manpower from northeast India is undeniable.

Mechanical Engineering Department newsletter is published annually and inaugurated on Assam Engineering College Foundation Day on 25<sup>th</sup> January every year. Our effort is to showcase all the important activities, achievements, events and changes related to the department as well as the faculties, staff and students occurred in last one year. Additionally, writeups, articles are invited from alumni, present and past faculties, staff and students.

Its heart-warming to see the quick and positive responses of alumni on reminiscence of their college days. We are really grateful to Mr Baneswar Khound (alumni) and Mr Amarjyoti Barthakur (retired professor) for their immediate responses to our request for articles. We are overwhelmed by the enthusiastic responses of our dear students who contributed in technical as well as non-technical topics including poetry.

Shaping up a newsletter, though not a very big task, is a teamwork and requires help and effort of all concerned. We would again like to thank Dr. R. K. Dutta (HoD, MED, AEC) for bestowing upon us the responsibility of curating this edition. The editorial team expresses its gratitude to all who contributed their valuable articles. We are deeply indebted to all the contributors for their valuable time and efforts. We offer our heartfelt thanks to all our departmental colleagues and staff for their support and encouragement. We would like to thank our students Mr. Vivian Das Barman and Ms. Dixeeta Mudiar for helping us in gathering articles from the students for this edition. The editorial team shoulders the responsibility of unintentional factual/typographical errors if any and may kindly be excused.

Lastly, in this unprecedented time of COVID 19 pandemic, we wish all of you a happy, healthy and safe future ahead.

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## Editorial team



**Dr. Manjuri Hazarika**  
Professor  
MED, AEC Guwahati



**Dr. Basab Jyoti Phukan**  
Associate Professor  
MED, AEC Guwahati



**Mr. Piyush Singh**  
Assistant Professor  
MED, AEC Guwahati



## YANTRIK-OYANTRIK

This is the annual newsletter of the Department of Mechanical Engineering, AEC Guwahati. Published every year on 25<sup>th</sup> January, the foundation day of the College. It highlights the activities, events and achievements of the department to the stake holders and to the public at large. This is the sixth edition of this newsletter.

2021-22

Sixth Edition

Editors:

Dr. Manjuri Hazarika  
Dr. Basab Jyoti Phukan  
Piyush Singh

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## In this Issue

HOD'S message	1
From the Editorial Desk	3
Department Profile	5
People in the Department	6
Mechanical Engineering Education – A historical Perspective	
<i>Dr. D. K. Mahanta</i>	7
Sustainable developments – A few challenges before Engineers	
<i>Dr. A. Borah</i>	10
১৭ জানুৱাৰী	
<i>Shri Baneshwar Khound</i>	13
Snippets	
<i>Prof. Amar Jyoti Barthakur</i>	15
ELYSIAN 3.0: The story behind the success	
<i>Automobile Club AEC</i>	17
“E Learning” and technical education: Pros and cons	
<i>Ms. Argha Borthakur</i>	20
আজিৰ সত্য	
<i>Mr. Ashutosh Barkataky</i>	22
Tree of light	
<i>Mr. Bedanga Chutia</i>	23
নিস্কন্ধতা	
<i>Mr. Abhinab Nath</i>	24
ফাগুন	
<i>Ms. Mridushmita Engtipee</i>	24
Traversing love	
<i>Ms. Shreya Lopamudra</i>	25
মোৰ স্বাভিমান	
<i>Mr. Abinash Dutta</i>	25
মৰীচিকাৰ অনুভূতি	
<i>Mr. Partha Pratim Changmai</i>	26
Sponsored Research Projects	27
Publications of Faculty Members in 2021	29
Year 2021 at a glance	31

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## DEPARTMENT PROFILE

### AEC's Vision:

To be an institution for promoting and supporting sustainable development.

### AEC's Missions:

- ◆ To prepare technical manpower with knowledge, skills and values of sustainability.
- ◆ To take up relevant problems of society & industry as projects, research themes for study and to provide technological solutions.

The Department of Mechanical Engineering was established in the year 1957. It was the second department of Assam Engineering College Guwahati offering UG course in Mechanical Engineering (ME). The department's long history is resplendent with significant service to the nation and the world. The alumni of the department are well placed in the society throughout the globe bringing laurels to the department and the institute.

In the year 1998, the UG course in Industrial & Production Engineering (IPE) was introduced. Subsequently, from the year 2007 PG and PhD courses in Mechanical Engineering were offered. The current intake in UG (ME) and UG (IPE) is

66 and 22 respectively. While the intake in PG (ME) is 18.

### Department's Vision:

To build professionally competent Mechanical Engineers capable of contributing towards development of the nation and betterment of the society.

### Department's Missions:

- M1. To generate academic atmosphere conducive for developing soft skills, teamwork, leadership & entrepreneurship upheld by professional ethics and committed to development of the nation.
- M2. To provide high quality education for undergraduate programme in Mechanical Engineering and for higher study by adopting strategic approach in curriculum design and teaching methodology.
- M3. To promote acquisition of new knowledge and skill by collaborating with institutes of excellence and industries.
- M4. To generate new knowledge by creative thinking and innovative research targeted at the needs of the society and also North East India.

### Program Educational Objectives (PEO)

1. Graduate engineers will develop effective technical expertise in Mechanical Engineering upholding ethical & moral values in practice and public life.
2. Graduate engineers will apply their innovative thinking and problem-solving capability in social and professional life, exhibiting leadership by communication and teamwork.
3. Graduate engineers will be proficient in continuing their higher studies, professional development courses and research.
4. Graduate engineers will be capable of mobilizing human and physical resources to their fullest extent in organizations for holistic development.

### Program Specific Outcomes (PSO)

- PSO1. Graduate Engineers will be able to exhibit excellence in the design of mechanical engineering systems using classical and state-of-the-art tools.
- PSO2. Graduate Engineers will be able to exhibit employable skill in the areas of thermal power and modern manufacturing.



## PEOPLE IN THE DEPARTMENT

### List of Faculty Members

SL NO	NAME	DESIGNATION	AREA OF SPECIALIZATION
1	Dr. RANJIT KUMAR DUTTA	PROFESSOR & HEAD	MANUFACTURING
2	Dr. SUDIP KUMAR DEB	PROFESSOR	INDUSTRIAL ENGINEERING & MANAGEMENT
3	Dr. PRADEEP KUMAR MAHANTA	PROFESSOR	DESIGN
4	Dr. KALYAN KALITA	PROFESSOR (IPE)	COMPUTATIONAL FLUID DYNAMICS
5	Dr. PLABON KAKOTI	PROFESSOR	INDUSTRIAL ENGINEERING & MANAGEMENT
6	Dr. NIHARENDU SAHA	PROFESSOR	MACHINE DESIGN, TRIBOLOGY, COMPOSITE MATERIAL
7	Dr. ANIL BORAH	PROFESSOR	ADVANCED MANUFACTURING
8	Dr. DILIP KUMAR BORA	PROFESSOR	ALTERNATIVE FUELS, IC ENGINES, RENEWABLE ENERGY
9	Dr. MANJURI HAZARIKA	PROFESSOR	CIM, GREEN MANUFACTURING
10	Dr. KALYAN KUMAR DAS	PROFESSOR (IPE)	AEROSPACE ENGINEERING & APPLIED MECHANICS
11	Mr. BAHARUL ISLAM BARBHUYAN	ASSOCIATE PROFESSOR	THERMAL ENGINEERING, ENVIRONMENT
12	Dr. KAMAL KUMAR BRAHMA	ASSOCIATE PROFESSOR	ENERGY
13	Mr. PRSANTA KUMAR CHOUDHURY	ASSOCIATE PROFESSOR	THERMAL ENGINEERING
14	Ms. MOUSUMI GOGOI	ASSISTANT PROFESSOR	MANUFACTURING, DESIGN
15	Mr. JITUL BARUAH	ASSISTANT PROFESSOR	THERMAL ENGINEERING
16	Dr. BASHAB JYOTI PHUKAN	ASSOCIATE PROFESSOR	THERMAL ENGINEERING
17	Dr. PRADIP BAISHYA	ASSOCIATE PROFESSOR	SOLID WASTE MANAGEMENT
18	Dr. MANASH HAZARIKA	ASSOCIATE PROFESSOR	ADVANCED PRODUCTION SYSTEMS
19	Mr. MADURJYA BARUAH	ASSISTANT PROFESSOR	MACHINE DESIGN, VIBRATION
20	Mr. SUBHRANSU SEKHAR MALLICK	ASSISTANT PROFESSOR	FLUID & THERMAL ENGINEERING
21	Mr. PIYUSH SINGH	ASSISTANT PROFESSOR	MANUFACTURING
22	Mr. JYOTHIS A	ASSISTANT PROFESSOR	FLUID & THERMAL ENGINEERING
23	Mr. MOHAMMED RAFLA	ASSISTANT PROFESSOR	FLUID & THERMAL ENGINEERING
24	Mr. ANIRBAN SAHA	ASSISTANT PROFESSOR	CAM
25	Dr. DEVARSHI KASHYAP	ASSISTANT PROFESSOR	MANUFACTURING
27	Mr. MANASH BHUYAN	ASSISTANT PROFESSOR (IPE)	INDUSTRIAL & PRODUCTION ENGINEERING
28	Mr. MONOJ BARUAH	ASSISTANT PROFESSOR (IPE)	INDUSTRIAL & PRODUCTION ENGINEERING
29	Ms. RIDDHI BORDOLOI	ASSISTANT PROFESSOR (IPE)	EMBEDDED SYSTEMS

### List of Supporting Staff

SL NO.	NAME	DESIGNATION
1	Mr. APURBA KR DAS	TECHNICAL OPERATOR
2	Mr. NILAMONI SARMAH	JUNIOR INSTRUCTOR
3	Mr. JYOTISH KATHAR	JUNIOR INSTRUCTOR
4	Mr. MAHESH BARMAN	BOILER ATTENDANT
5	Mr. PRANAB JYOTI SARMAH	JUNIOR INSTRUCTOR
6	Mr. MOSTAB ALI	BEARER
7	Mr. KANGKAN BAISHYA	BEARER
8	Mr. MAJIBUL HAQUE	BEARER
9	Mr. MAINUL ALI	COMPUTER LAB SERVICE (TEMPORARY)
10	Mr. NAYAN DUTTA	COMPUTER OPERATOR



# MECHANICAL ENGINEERING EDUCATION – A HISTORICAL PERSPECTIVE

**Dr. Dimbendra Kumar Mahanta**

*Professor, Mechanical Engineering Department  
Assam Engineering College*

Similar to civil engineering, the history of mechanical engineering is also as old as civilization. When ancient man learnt how to produce eatables from nature, he abandoned nomadic life and started settling down. Man gradually felt the need for tools to ease out their efforts in production work and this necessity led to inventions of tools like hoe, axe, hand-plow etc. in ancient time. This was the earliest stage of mechanical production process.

As the civilization progressed, concepts of mechanics and machines developed. Basic machineries powered by human or animal effort, water or wind energy, or their combination were invented and all these helped in steady progress of the civilization. Ancient Greece showed the first sign of high-level work in technical fields, especially on mechanics. The brightest example is the famous academic institute of 3<sup>rd</sup> century BC, School of Alexandria, where celebrities like Archimedes and Euclid received their training. Hero, the famous trainee of the school, is best known for his work on pneumatics.

The medieval age saw growth of mechanical engineering in the Islamic world. A very iconic example of it is the book by the thirteenth century scholar Al-Jazari ‘*The Book of Knowledge of Ingenious Mechanical Devices*’, in which he described 50 mechanical devices, along with instructions on how to construct them.

The period from 14<sup>th</sup> to 17<sup>th</sup> century was marked as the era of *Renaissance in Europe*. It was an era of cultural, artistic, political and economic rebirth in the continent. Added to it were the different artistic and technological innovations that paved the way for the spread of mechanical devices and machines. The study of machine mechanics as an application of physics by Guidobaldo del Monte, Galileo Galilei and others had brought about a Machine Renaissance in Europe.

Mechanical engineering as a field of study, however, started only after the advent of the Industrial Revolution. The central role in the revolution was played by the expansion of mechanization. A number of authors, like Paulinyi, von Tunzelmann consider mechanization and the related rise of a technological system capable of producing “machines to make machines” as the key technological element of the early phases of industrialization [*Macleod & Nuvolari, Glorious Times: The emergence of Mechanical Engineering in Early Industrial Britain, C 1700-1850, Brussels Economic Review-Cahiers Economiques De Bruxelles, Vol 52, No (3/4), pp 215-236, Autumn-Winter*]. Other contemporaneous radical innovations, such as transformations in power technologies (in particular, the steam engine), although of fundamental economic importance in the very long run, produced sizable economy-wide repercussions only from the mid-nineteenth century onwards.

Karl Marx discussed on the role of such technical change in the industrial revolution. He emphasized that the distinctive technological feature of modern industry was the mechanization of production. When production becomes performed by means of systems of machinery, Marx noted, production processes are susceptible to self-sustained and continuous improvement. This is because the adoption of systems of machinery and the ensuing reconfiguration of production processes that are increasingly independent of human intervention open the door to the systematic application of the





principles of science and engineering to the sphere of production [Marx, K., 1990. *Capital. Volume I, pp 501-502, Harmondsworth: Penguin*]. Marx further remarks that the expansion of mechanization determined the emergence of an independent machine-making industry. The stage of machines making machines can be dated, in view of Marx, to the early 1850s. The need for introduction of systematic study on the efficient production thus arose and led to the emergence of mechanical engineering as a separate area of study. Education in mechanical engineering has historically been based on a strong foundation in mathematics and science.

The first professional society for mechanical engineers, the Institute of Mechanical Engineers, was formed in the United Kingdom in 1847, thirty years after the civil engineers formed the first such professional society Institution of Civil Engineers. In the United States, the American Society of Mechanical Engineers (ASME) was formed in 1880.

The first schools in the United States to offer mechanical engineering education were the United States Military Academy in 1817, an institution now known as Norwich University in 1819, and Rensselaer Polytechnic Institute in 1825.

Over these long years, mechanical engineering has undergone a sea change in its field. Subsequently mechanical engineering education has become more and more dynamic integrating and applying knowledge from various fields. Recently, it has also focused on some cutting-edge subjects such as nanotechnology, mechatronics, robotics, computational mechanics, biomechanics, alternative energies, as well as aspects related to sustainable mechanical engineering.

In India, Benaras Hindu University (BHU) has the credit of being the first institute to offer degree course in mechanical engineering in 1917.

### **Mechanical Engineering Education in Assam**

In September 1955, the Planning Commission appointed an Engineering Personnel Committee, headed by Dr. J C Ghosh, Member (Education) Planning Commission and Mr. L S Chandrakant, Deputy Educational Adviser (Technical), Ministry of Education, to undertake an overall assessment of the demand and supply position in respect of Engineering personnel—graduates and diploma holders—during the Second Plan period and to recommend the extent to which facilities for Technical education should be expanded. The committee, in its report submitted on 17.1.1957, suggested among others the introduction of two new branches of engineering in Assam. ‘It is also proposed that the Assam Engineering College, Gauhati, which started last year and which is conducting only Civil Engineering Degree courses at present should have Departments of Electrical & Mechanical Engineering for the Degree courses in these subjects, so that the institute may become a complete unit for all the three basic faculties of Engineering and train the personnel required for the State’ – the report said [*Proceedings of the Tenth Meeting of the All-India Council for Technical Education held at New Delhi on. 22<sup>nd</sup> February, 1957, Appendix B: Ghosh-Chandrankanth Committee Report, Page 115*]. Accordingly, the Mechanical Engineering Department, along with Electrical Engineering Department, was opened in Assam Engineering College with intake capacity of 30 vide Govt order No. F.2-6/57/T-4 dt 19/11/57.

The session started in 1957 itself and the first batch of students was inducted through a special admission test convened jointly for the two newly introduced courses. Prof. R J Thakkar was appointed as the Professor and Head of the department in August, 1957. Debabrata Goswami joined in early 1958 and was instrumental in setting up laboratories of applied mechanics, metrology and automobiles. Damodar Choudhury was inducted from PWD into the department as Assistant Professor. A K



Padmapati, a graduate from IIT Kharagpur, joined the college in June, 1958 along with Amar Sinha as lecturers.

Mechanical workshop is always an integral part of mechanical engineering department. Prof. D Goswami took the initiatives to make the workshop machinery operational. He was ably supported by the Chandra Kumar Baruah, who joined as Workshop Superintendent in the college in 1958. Baruah had a post-graduate degree in engineering and training in Germany. Bholu Sarma, an ex-army-man, was appointed as workshop instructor. However, he left the job soon and he was replaced by T C Bordoloi as instructor. Bapuram Saikia and Ram Chandra Bhuyan were appointed as instructors of carpentry and smithy respectively.

Due to untiring efforts of Prof. D Goswami and A K Padmapati, several laboratories, namely applied mechanics laboratory, meteorological laboratory, automobile laboratory, were soon geared up in the department. With active interest of Principal N Dasgupta and active participation of C K Baruah, testing machines, workshop machineries and welding machines were installed smoothly. Thus, by 1958-59, there was little of testing facilities in the college and, being the first institution of higher education in the north-east India, the AEC was ready to provide technical assistance to industries and government agencies. Requests for such assistance arrived from railways and refinery. Railways had been constructing the Brahmaputra bridge at that time. Guwahati Refinery was also under construction with Romania's participation. Laboratories and workshop of AEC were utilized to carry out all testing whether for welder dependability and strength of concrete in service of these two organizations. Thus, the following three years 1960 – 62 were the years of active cooperation with industries. Romanian engineers regularly came to the college for calibration of gauges and testing of materials. Young teachers of the college associated with these works were excited to be parts of all these activities.

The journey of mechanical engineering education in Assam, India and abroad has flourished since then and has been able to cater to the needs of the society.

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*“Assamese women are born weavers;  
they can weave fairy-tales in their cloth”*

— Mahatma Gandhi



## **SUSTAINABLE DEVELOPMENTS — A FEW CHALLENGES BEFORE ENGINEERS**

**Dr. Anil Borah**

*Professor, Mechanical Engineering Department  
Assam Engineering College*

In 1980, the International Union for the Conservation of Nature published a world conservation strategy that included sustainable development as global priority and coined the term "sustainable development". Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. It can be defined as the practice of maintaining processes of productivity indefinitely—natural or human made—by replacing resources used with resources of equal or greater value without degrading or endangering natural biotic systems. United Nations (UN) High-Power Open Working Group on sustainable developments has identified the 17 sustainable goals in the UN General Assembly in September 2015 to improve the lives of people everywhere. The governments, the private sector, society and people need to do their part for the goals to be achieved. In this article, a few challenges before the engineers for sustainable developments are discussed.

Engineering is basically a profession which makes use of knowledge acquisition, creation and commercialisation. Engineers have carried out commendable jobs in the past as well as in the present and the comforts we are getting are because of the great contributions of the engineers. Over the centuries the world has seen amazing achievements which contribute to the betterment of the society, contribute to the comfort and standard of living as well. All these fascinating contributions over the centuries are because of the professionalism and imagination of engineers with the aid of science and technology. Engineers have played vital roles in social and economic prosperity, through innovations starting from agricultural, textile, power, road transport, telecommunication systems, which shape the modern civilization. Now, the world requires trained and innovative engineers. The future engineers have to be hyphenated i.e., trained in two or more inter disciplinary fields and have the ability to draw them together. Developments in certain areas have contributed to the environmental problems which affect the sustainability. The negative impacts associated with these improvements are the pollution, exposure to toxin, shortage of drinking water, waste management etc. These negative impacts are the challenges before the engineers in the present world and here the sustainability becomes imperative. Engineers require not only the capability to analyse, the ability to synthesize the solution and require an innovative team effort to solve these problems alongside the other non-technical disciplines.

Pollution occurs mainly in air and water. Unwanted activity of people like burning of agricultural wastes like straws causes smog resulting in the breathing problem and asthma attacks. It is well-known to all how the burning of agricultural wastes in Haryana causes smog in Delhi and some people experienced frequent asthma attacks. This was also the case in Punjab. The farmers cannot only be blamed for this as there is no good government waste management policy. This is a challenge for the engineers to innovate and design a viable and cheap waste management system. The present



practice for dumping and land filling by garbage is not at all a good policy. It not only pollutes the air but also jeopardises the water habitat and aquatic life causing an ecological catastrophe of sorts. Magsaysay awardee Mr. Sonam Wangchuk came up with a idea of “Straw Clay” – the clay reinforced with straw that are burnt so much in Punjab, Haryana and other states causing lot of pollution. The prefabricated straw clay blocks are used to construct building in Ladakh for general people as well as for army.

Innovation of a low-cost recycling technique for plastic is another challenge for the engineers. Plastic is a wonderful invention of the scientist which is corrosion resistant as well as not biodegradable. Engineers utilise it for manufacturing useful products like polythene bags which we use in our day-to-day life. However, throwing of plastic bags blocks the drainage system of the city that results in water logging. For it, it is not plastic, humans are to be blamed for the unwise throwing of plastics. Size of polythene bags does not matter and bags irrespective of size can create such problem and. In absence of a viable and cheap recycling technique, industries are not willing to recycle these bags. Hence, it is a challenge for the engineers. According Mr. Sonam Wangchuk, using plastic is good; however, misusing plastic is very bad. The above statement he made in the context of greenhouse type houses in Ladakh to keep it warm during winter. The plastic rooftop becomes the heat engine for the houses.

There is a high demand of fossil fuels with the rapid industrialisation and tremendous progress in the transport sector. The use of fossil fuels in IC engines results in the atmospheric pollution in the form of emission of greenhouse gas. Fossil fuels are depleting. China has to reduce the output of industry, limit the use of diesel vehicles and slower down the construction to reduce the problem of smog from time to time. Non-conventional renewable energy source is an alternative solution for energy generation. Viable low-cost energy generation from municipal solid wastes may solve the problem of waste management in a city. Issues pertinent to waste-to-energy concept are to be resolved by the engineers. In-vestment cost is high in solar power generation due to costly solar panels and storage batteries. Low-cost solar panel and durable low-cost batteries will enhance solar energy generation. Cost effective batteries will also make eco-friendly electric cars attractive. These are the challenges before engineers for sustainable developments.

There is a grave concern associated with our domestic refrigerators and air conditioners. In refrigerators, chlorofluorocarbons (CFC) are used as refrigerant which are neither toxic nor flammable, seemed practically non-reactive and has suitable thermal proper-ties. CFCs have been found to cause the depletion of the ozone layer. The ozone layer in the upper atmosphere absorbs ultraviolet (UV) radiation from the sun and prevents it from reaching the earth surface and thereby protects from the harmful effects of UV rays. Though the refrigerant flow in a closed cycle, it may cause damage through leakages in the system or during disposal of refrigerator. CFCs are very stable in atmosphere and in case of leakage; it will keep depleting ozone layer for a very long period. The alternatives like hydrofluorocarbons (HFC) are also not environment friendly. Though a variety of climate-friendly, energy efficient, safe and proven alternatives are available today, they are not suit-able for all categories of products due to different thermodynamic and safety properties. This is also challenge for engineers to find an environment-friendly refrigerant.



Flood and bank erosion by mighty Brahmaputra is a concern for Assam hampering the development of the state. Every year hectares of land go into the river damaging crops, agriculture resulting in the loss of habitat land. According to the report of the government, more than 4.27 lakh hectares of land was eroded away by the river Brahmaputra and its tributaries since 1950. A sustainable engineering solution to the problem requires an integrated approach involving all the departments including the society.

There are many challenges before the engineers. Solution of the problems requires innovative and holistic approaches of the government and the policy makers. A shared vision is also required of all stake holders to shape our present and future to be more sustainable.

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*“Strength is Life, Weakness is Death.  
Expansion is Life, Contraction is Death.  
Love is Life, Hatred is Death.”*  
— Swami Vivekananda

## ॥ ১৭ জানুৱাৰী ॥

বানেশ্বৰ খাউণ্ড

অৱসৰপ্ৰাপ্ত মুখ্য অভিযন্তা, অসম ৰাজ্যিক বিদ্যুত পৰিষদ (উৎপাদন)

১৯৬৭ চনৰ ১৭ জানুৱাৰী ।

পুৱাৰে পৰা ধৰি পৰম হেঁপাহেৰে বাট চাই থকাৰ অন্তত সন্ধ্যাটো আহিল। কলেজ কেণ্টিনত চাহ-চিংৰা খাই উঠি খোজ কাঢ়িলোঁ। টকলা শিলাময় পাহাৰটোৰ নামনিৰ সমতলত সোঁমাজত ওখ গন্ধুজটোৰে সোঁৱে-বাঁৱে বিস্তাৰিত শাখা-প্ৰশাখাক লৈ থিয় হৈ থকা কলেজ ভৱনটো আৰু সন্মুখত দিপৰ বিলৰ বিস্তীৰ্ণ জলাধাৰ---এই সামগ্ৰিকতাই তুলি ধৰা নান্দনিক দৃশ্যপটে সদায়েই মোক পুলকিত কৰি ৰাখিছিল। কাজেই, আন দূৰণিলৈ নগৈ সেই এলেকাটোতে কৰা প্ৰতিটো সান্ধ্য ভ্ৰমণে মোৰ মন-প্ৰাণ নিত্য নতুন ভাৱনাৰে সঞ্চাৰিত কৰি তুলিছিল। সেইদিনাও সেই এলেকাতে ক্ষণেক সময় বিচৰণৰ অন্তত মই প্ৰেক্ষাগৃহত প্ৰৱেশ কৰি একেবাৰে শেহৰ শাৰীৰ আসন এখনত সন্তৰ্পণে বহিলোঁগৈ। সুসজ্জিত আটোমটোকালী প্ৰেক্ষাগৃহ। অধ্যক্ষ ড°শৈলধৰ গগৈকে প্ৰমুখ্য কৰি অধ্যাপক সকল, ছাত্ৰ-ছাত্ৰী আৰু কৰ্মচাৰী দৰ্শক সকলৰ উপস্থিতিৰে প্ৰেক্ষাগৃহ ভৰি পৰিছে। এটা সুশৃঙ্খল, গহীন-গম্ভীৰ আৰু কোলাহলবিহীন পৰিৱেশ। নিৰ্ধাৰিত সময়ত অনুষ্ঠান আৰম্ভ হৈ সেই বিশেষ মুহূৰ্তটোত উপনীত হোৱাৰ লগে লগে ঘোষিত হ'ল--'এতিয়া আমি আগবঢ়াবলৈ লৈছোঁ আজিৰ সঙ্গীত সন্ধিয়াৰ বিশেষ আকৰ্ষণ ড°ভূপেন হাজৰিকাৰ অনুষ্ঠান ---।' মই উত্তেজিত হৈ উঠিলোঁ আৰু নিৰিষ্ট চিন্তে ৰ লাগি মঞ্চত দৃষ্টি নিষ্ক্ষেপ কৰিলোঁ। মঞ্চৰ আঁৰ কাপোৰ খোল খালে। মূৰত ক'লা নেপালী টুপী পৰিহিত ওখ-পাখ গৌৰবৰ্ণৰ পুৰুষ গৰাকী মঞ্চলৈ সোমাই আহি মাইক্ৰ'ফোনৰ সন্মুখত থিয় হৈ দৰ্শক সকললৈ দুহাত তুলি নমস্কাৰ জনাই হাৰ্মনিয়ামৰ ৰীডত আঙুলি বুলাই মানে আন সহযোগী তিনিগৰাকীয়েও মঞ্চৰ যথাস্থানত থিয় দি সাজু হ'লহি। মোৰ বুজিবলৈ বাকী নাথাকিলে ক'লা টুপী পৰিহিত লোকজনেই ভূপেন হাজৰিকা। হাৰ্মনিয়ামৰ ৰীডত আঙুলি বুলাই থাকিয়েই ভূপেনদাই দৰ্শকৰ ফালে চাই ক'লে-- 'ৰাইজ, বৰ ঠাণ্ডা ! অ'ভাৰকোটটো পিন্ধি আহিছোঁ, দায়-দোষ নধৰে যেন ।' এইবাৰ তলমূৰকৈ হাৰ্মনিয়ামখনত মনোনিৱেশ কৰি পুনৰ দৰ্শকলৈ চাই ৰীডত হাত বুলায়েই কৈ গ'ল--' আজি সোতৰ জানুৱাৰী ; জ্যোতিপ্ৰসাদ আগৰৱালাৰ মৃত্যু তিথি। তেওঁৰ এটি গীতেৰে মই অনুষ্ঠান আৰম্ভ কৰিবলৈ লৈছোঁ ' বুলি জুৰি দিলে-- 'আমাৰে সখিয়া আকুল বিয়াকুলে/সপোনৰ হাঁহিটি চাই/ অ' সপোনৰ হাঁহিটি চাই/ সপোনত কোঁৱৰে আলুদি আনিলে/ মতলীয়া সখী খায় -----।'।

সমগ্ৰ প্ৰেক্ষাগৃহ শব্দৰ বাংকাৰ আৰু সুৰৰ মুৰ্চ্চনাত ডুব গ'ল ! চিনা চিনা, জনা জনা সুৰ ; প্ৰাণৰ ভাষা, প্ৰাণৰ কথা লুকাই থকা সহজ-সৰল সেই শব্দাৱলীৰ কি মৰ্মস্পৰ্শী আবেদন !

সোঁশৰীৰে ভূপেনদাক মই পোন প্ৰথমবাৰৰ বাবে দেখা পোৱা আৰু তেওঁৰ যাদুকৰী কণ্ঠত পৰিৱেশিত জ্যোতিৰ গীতেৰে জ্যোতিপ্ৰসাদলৈ আগবঢ়োৱা মৃত্যুতিথিৰ তৰ্পণ---এই দুয়োটা কথাৰে ১৭ জানুৱাৰীৰ সেই সন্ধিয়াটো মোৰ বাবে অবিস্মৰণীয় হৈ ৰ'ল।



সেই অনুষ্ঠানত ভূপেনদা পৰিৱেশিত গীতসমূহ টেইপ ৰেকৰ্ডাৰত বাণীবদ্ধ কৰা হৈছিল আৰু অনুষ্ঠানৰ পৰৱৰ্তী কেইবাদিনো ধৰি মই থকা ১নং ছাত্ৰাৱাসৰ কমনৰুমত সন্ধিয়া পৰত বজোৱা হৈছিল। 'আমাৰে সখিয়া ----' গীতটো তেনেকৈ শুনি শুনিয়েই মই লিখি লৈছিলোঁ আৰু সুৰটোও আয়ত্ব কৰি পৰৱৰ্তী সময়ত ভালদৰে গাব পৰা হৈছিলোঁ।

অসম অভিযান্ত্ৰিক মহাবিদ্যালয়ৰ প্ৰথম বাৰ্ষিকৰ ছাত্ৰাৱস্থাৰ তেনে এক পৰিক্ৰমাতে 'জ্যোতিপ্ৰসাদ' আৰু '১৭ জানুৱাৰী' এই দুটা বিষয়ৰ প্ৰতি মই প্ৰবলভাৱে আকৃষ্ট হৈছিলোঁ। কিন্তু সেই সময়ত এই দুই বিষয়ত ৰাজ্যখনত চৰ্চা কৰা লোকৰ সংখ্যা আছিল তেনেই তাকৰ; সমল আছিল দুস্প্ৰাপ্য!

১৯৭৪ চনৰ পৰাহে অসম চৰকাৰে ১৭ জানুৱাৰী দিনটো 'শিল্পী দিৱস' হিচাপে পালন কৰিবলৈ লৈছে। ১৯৮১ চনৰ জানুৱাৰী মাহতহে অসম প্ৰকাশন পৰিষদৰ দ্বাৰা 'জ্যোতিপ্ৰসাদ ৰচনাৱলী' প্ৰকাশ পাইছে।

নামৰূপ তাপবিদ্যুত কেন্দ্ৰত সত্ত্বে দশকৰ পৰা ত্ৰিশ বছৰ ধৰি কৰ্মৰত হৈ থাকোঁতে জ্যোতি-বিষ্ণু সন্দৰ্ভত হোৱা সঘণ আৰু বিস্তাৰিত চিন্তা-চৰ্চাত এই কথা প্ৰতীয়মান হৈ উঠিছিল যে এটা সুস্থ ঔদ্যোগিক কৰ্ম-সংস্কৃতিৰ বাতাৱৰণ গঢ়াত জ্যোতিপ্ৰসাদৰ সৃষ্টিৰাজিয়ে অপৰিমেয় অৰিহণা আগবঢ়াব পাৰে। সেয়ে নামৰূপত '১৭ জানুৱাৰী' আছিল অৱশ্যেই পালনীয় এক গুৰুত্বপূৰ্ণ দিৱস। এটা দিন আহিছিল যেতিয়া বিদ্যুত কেন্দ্ৰটো নিয়াৰিকৈ পৰিচালনা কৰাৰ স্বাৰ্থতে জ্যোতিপ্ৰসাদৰ কথা আৰু গীত-মাতৰ ব্যৱহাৰিক প্ৰয়োগৰ প্ৰয়োজন সৰ্ব্বাধিক হৈছিল। জ্যোতিপ্ৰসাদৰ মৰ্মবাণী --- 'মানুহ হৈছে সপোনক দিঠকলৈ পৰিণত কৰা শিল্পী/ 'মানুহ ফুলিব লাগিব বিকশি'/আদিৰে বিষয়া-কৰ্মচাৰী সকল সততে উদ্বুদ্ধ হৈছিল আৰু তেনে দৰ্শন-ভাৱনাৰে সংপৃক্ত ব্যৱস্থাপনা(management)ৰ দ্বাৰাই পৰিচালিত হৈ ৰাজ্যখনৰ সেই প্ৰাচীনতম বিদ্যুত কেন্দ্ৰটোৱে নানান সংকটকালীন পৰিস্থিতিকো সাহসেৰে চম্ভালিবলৈ সক্ষম হৈছিল।

আজি মোৰ ক'বৰ মন গৈছে---মোৰ কৰ্মজীৱনৰ পীঠস্থানস্বৰূপ সেই নামৰূপত যি দৰ্শন আৰু ভাৱনাই আমাক পথৰ সন্ধান দিছিল, মোৰ মন গহনত তাৰ অংকুৰণ হোৱাৰ ক্ষেত্ৰ সংস্থাপিত হৈছিল মহাবিদ্যালয়খনৰ প্ৰেক্ষাগৃহত অনুষ্ঠিত ১৯৬৭ চনৰ সেই ১৭ জানুৱাৰীৰ সঙ্গীত সন্ধিয়াতে!



#### **ABOUT THE AUTHOR**

*Shri Baneshwar Khound is an esteemed alumnus of Assam Engineering College Guwahati (B.E. Mechanical Engineering, Batch 1966-71). After graduating from the college, he had a long and prolific professional career. He retired as Chief Engineer from Assam State Electricity Board (Production). Presently, he is enjoying his post-retirement life at his home at Khanapara, Guwahati.*

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## SNIPPETS

**Amar Jyoti Barthakur**

*Associate Professor (Retired), Mechanical Engineering Department  
Assam Engineering College*

Impromptu decision sometime acts as turning point in life as still vividly remember when form for medical entrance examination was literally torn into pieces at nearby bus stop and went to watch the famous noon show “A3” (Amar Akbar Anthony) way back in 1977 and next day appeared in engineering entrance and eventually the tag as “AECians” which endears to every diaspora whose roots are none other than 781013.

To chronicle a few lines for Yantrik Oyantrik would not have been possible without mentioning the name of Late Prof P.M Deka Sir who changed the branch to Mechanical from Chemical. The reason for initially opting for Chemical had now buried in the pages of history.

The four years stint at AEC extended to almost five years owing to the famous “Assam Agitation” was one of the golden phases of life. During our time the yearly exam was held and “Puriya” a coinage which creates havoc at the night before the examination. A handful of boarders of the hostel were seen hopping from hostel to hostel to collect the “Puriya” which provides succour in crossing the golden thread mark of 35 marks. But in the process, some of the gullible boarders have made their life measurable in getting the adulterated version. Me too a victim during Electronics paper in the third year but somehow managed to scrap through.

During those times most of us make a beeline to Panbazar (daytime) and University campus (evening) and the reason needs no further elaboration. The term “Discollegiate” is quite alien to our time. Not many but a handful of us are always present at the famous “B & N Dey” shop in Panbazar and used to sit on the wooden slab which is inconspicuous now-a-days. Memories are definitely etched to those who are frequented to depart pretty late at night from Panbazar never misses to drop in at a small joint the famous “Pandit’s Dukan” adjacent to Picadilly restaurant who used to manage all the precious stuffs for consumption with a little bit of premium of course. To catch the last bus from Guwahati at 8.30 PM is definitely always a joy ride to those who are least bit bothered about sessional and all those trivial things.

Most of us also eagerly look forward for “Youth Festival” held in University in misty winter night which used to be like Grammy Awards (never heard) because of lack of social media at that time but ushers a new dynamics amongst all the back benchers. Still remember an incident when one of my best friends tried to impress the best singer from Sivsagar at the festival and in the process introduced himself as the final year student but rather actually studying in the third year. As the time rolls out both of them going steady but later on revealed that her fiancé used to study together with her younger brother but that did not deter them and now a blessed couple and proud parents too.

There is no denying the fact that a good sense of rapport between students and teachers always prevails in MED and would like to cite three specific cases as far as the record goes which bears close





resemblance with Theano and her better half. But the three cases did not fructify eventually. More than that detail is refrained due to its sensitivity in nature.

Another fact is that the more than friendly ambience exists amongst the faculties in MED but the bitter truth is that when intertransfer looms large in the horizon a sense of bitter acrimony creeps in and lasts long which is the human trait.

One small incident has saddened at the fag-end of the career when shot glasses bought from Krabi were thrashed by none else than better half for gulping together with girl students at home but never-say-die attitude urged me to replenish again. But the big thing is that the post retirement puts myself not to be accountable any more to my spouse to the same old question at what time my scheduled class in the college because am never punctual on time.

Before winding up let me clarify that this excerpt would not have been penned down without inviting the intimidation from one of my dearest colleagues.



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**ABOUT THE AUTHOR**

*Prof. Amar Jyoti Barthakur is an esteemed alumnus of Assam Engineering College Guwahati (B.E. Mechanical Engineering, Batch 1977-81). He also had a long and successful teaching career at AEC Guwahati. He superannuated in September 2020 and post retirement he is pursuing his love for travel and photography.*

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*“The purpose of our lives is to be happy.”*

— Dalai Lama

## ELYSIAN 3.0: THE STORY BEHIND SUCCESS

Automobile Club AEC

A 13 membered team represented Assam Engineering College at Efficycle 2021 conducted by SAE-India Northern India Section brought laurels to our institution by receiving the "Best Business Plan and Innovation Award" and finishing at 6th among all technical institutions of Northern and Eastern India. SAE Efficycle is an extreme grueling competition considering the exhausting seven months duration and the fierceness of the contest as it attracts top engineering minds of the country. Here, we share the experiences and insights of the participants and their key takeaways from the journey.

### The First Challenge

The competition kicked off with the release of the First Package consisting of Project Plan, Design Validation Plan (DVP) and Bill of Materials (BOM). First Package stretched the horizons of the entire team by pushing them to delve into areas of knowledge never trodden before. The Project Plan, DVP and BoM were a clone of the planning required in a company boardroom to establish their manufacturing plant. The technical parameters and cost of the vehicle, various quality checks and deadlines for our work brainstormed in First Package. It culminated with a two-hour-long viva for Project Plan and another two hours for DVP and BoM by various industry experts.

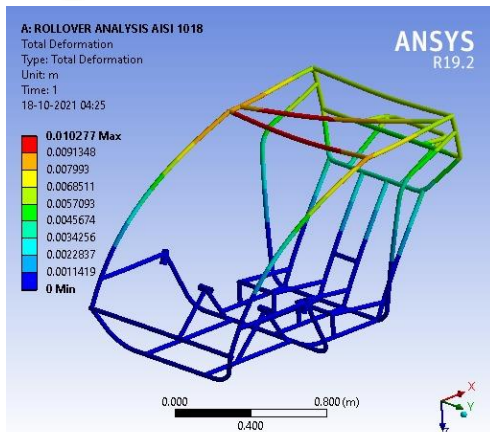


### The Sisyphean Tasks

The Second Package was the crux of the contest, for which we architected the Design of the Vehicle, performed the CAE and authored the Business Plan and Innovation Report. The enormous labour the team had to undergo over two months is reminiscent of Sisyphus from Greek mythology, which rolled a stone to the top of the mountain only to find the stone falling again.

We started researching mechanisms and materials to architect our vehicle, designing done on SolidWorks and analysis on Ansys. Each technical aspect was interrelated because mistakes in any sub-system created problems for the entire vehicle. In





these enervating two months, the technical team hustled their way up and managed to ready a model before the deadline. Their efforts paid off as Elysian 3.0 secured the highest marks in Design, CAD Report and the second-highest in CAE Report.

Receiving the Category Award for The Best Business Plan and Innovation Report was the highlight of this journey. This achievement is a testament to the un-quenching thirst for excellence exhibited by the team and not letting inexperience dampen their prospects. We reached out to several business professionals, bureaucrats, technocrats, professors and visited industrial plants to gain knowledge in this segment. The unparalleled insights and inputs in business and marketing and cutting edge technologies gained from our experience is cherished more than the Prize.

### The Achilles Heel

In the final stage, we simulated our vehicle using IPG Car Maker, state of the art simulation software used in the automotive industry. The software is inbuilt with unmatched features of tremendous utility and sophistication. We simulated our vehicle on terrains, a figure of 8 and performed numerous checks such as



Gradeability Test, Endurance Test etc. The team diligently learnt this software from scratch and accomplished all the requirements for this stage. More than half of the teams failed to meet the requisites leading to disqualification from the event. The event concluded with a review from a panel of the Organizing Committee.

In a nutshell, Efficycle 2021 ushered tremendous improvement in the participants' competency by teaching them the values of conscientiousness and teamwork, upgrading their technical and soft skills and embellishing their self-esteem.



The team expresses their deep profound gratitude to the Faculty of Mechanical Engineering for their extensive support throughout each step of the competition.

**Faculty in charge:** Mr. Subhransu Sekhar Mallick, Assistant Professor, Department of Mechanical Engineering, AEC Guwahati

**Team Members:** Vivian Das Barman (Captain), Prerona Dey (Vice-Captain), Shaswati Buragohain, Dixeeta Mudiar, Kritartha Sarma, Arindam Kashyap Ray, Hrishikesh Bharadwaj,

Sahil Ahmed, Siddhartha Das, Rituparna Das, Abhinab Nath, Gayatri Sharma and Luit Baglari.

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**Industry visit to Ashok Leyland Service Center, Ahom Gaon, Guwahati organized by the Automobile Club and Mechanical Engineering Department on 3<sup>rd</sup> December, 2021**

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# “E LEARNING” AND TECHNICAL EDUCATION: PROS AND CONS

**Ms. Argha Borthakur**

*B. Tech (5<sup>th</sup> Semester, ME, 2019-23) &*

*President, Space Technology Club (AEC Guwahati)*

The advent of COVID-19 pandemic marked the extensive online era in the field of education. The “e-learning” phase proved to be a challenge as well as an opportunity to various sectors of education; right from primary stage to higher education, from technical to non-technical education. Disruption on the normal schedule of classroom (offline) learning, a sudden shifting of the teaching learning method to online mode generated disturbance among students as well as teachers. Being a completely practical field, technical education falls among one of the worst hit areas. Teachers are facing issues as many of them are not much used to online teaching and the students complain of getting difficulties in following the lessons due to lack of eye contact with teachers. Moreover, the uncertainties about the examination and their future career have some adverse impact on the mental health of the students. In nutshell it can be said that COVID-19 pandemic has unleashed the biggest calamity that student community has faced so far. But there are two sides of a coin. Pros and cons go hand in hand. It has also been noticed that e learning has widened the horizon of education from a conventional method to a network enabled method. Thus, it is important to analyze the problems and prospects of e learning in the field of education with special reference to technical education.

Every student of technical education has a dream to pursue education in world class institutes like IITs and others. But only a few of them get an opportunity. But due to the “e learning” the students are getting better acquainted with online programmes under such institutions. And in addition to that under e learning method students of all locations, all institutions and even students from remote village areas are able to avail of the lectures of such institutes. This method of education has opened doors of opportunities for students who cannot afford go abroad in spite of good grades and skills for pursuing internships, workshops etc. due

## ABOUT SPACE TECHNOLOGY CLUB, AEC GUWAHATI

With a beautiful dream in aspiring minds, Space Technology Club, AEC was established in 2021 by Mr. Tilak Rabha, Mr. Arsel Adib and team, under the blessings and guidance of our teacher in-charge Dr. Plabon Kakoti sir (Professor, Mechanical Engineering Department, AEC Guwahati). The main objective of the club is to create awareness as well as encourage scientific temperament among students as well as the society towards astronomy. One of the main goals of the club is to ensure and propagate proper learning by providing projects, internships and other opportunities to the members. The club has organized several activities like competitions, webinars with esteemed speakers from organizations like ISRO, University of Leicester, University of Amsterdam etc. for the students. The club is not only limited to space technology, we are dedicated to giving an atmosphere to the students of the college and the students of Assam to get exposed to various technologies and resourceful persons which will inspire them. Some of our past speakers were Mrs. Helen Basil (System Engineer, VSSC, ISRO), Mr. Hridam Rajeev Singh (Dy Manager Solid Rocket Booster Plant SDSC, SHAR ISRO), Vijay Ashok Sharma (Recruiter Google South Asia Pacific Region), Jintu Sharma (Assam Civil Service (ACS)), Dr. Indu Kalpa Dehingia (India and Post Doctoral Research fellow at Indian Institute of Technology, Indore), Dr. Khun Sang Phukan (Post Doctoral Researcher NIKHEP and IOP, University of Amsterdam), Dr. Angaraj Duara (Space Instrumentation Scientist, Leicester Space Research Centre, United Kingdom) and Tarik Mitran (Soil Scientist at National Remote Sensing Centre, Indian Space Research Organization).



to financial constraints and many other issues. The pandemic situation has converted the impossibilities into possibilities by opening the online platform for all.

During the pandemic, restrictions on physical human interaction not only caused major problems in educational sector but also interrupted the smooth operation of health care service, entrepreneurial activities in industrial as well as service sectors. In an article published in International Journal of Science and Research, Vol 10, February 2021, it is predicted that by 2030, many problems in health care sector would be tackled with the help of Artificial Intelligence, which will not only save time, but also reduce human interactions and hence prevent the spread of deadly diseases. If in a delicate service like the medical sector Artificial Intelligence can be used, then why can't we think for using it in educational sector? We can also think of using a robot in conducting various lab work. If a big Multinational Company can function by adopting 'work from home', then why can't we think about 'lab from home'. If it could have been implemented, students from the institutions with poor infrastructure can avail of lab facility of other institutions with sophisticated infrastructure. Under this e-learning method, a small lab will be able to accommodate a large number of students at a time. It would also be cost effective for a developing country like India. If it could have been implemented, the e learning would be proved to be a great advantage for the students of technical education. This idea is just in the threshold of a wide scope in a practical based study like engineering. Further conducting seminars in physical presence of personalities/scientists from organizations like ISRO, NASA, foreign universities is a costly and time taking process. But under "e learning" mode we can not only hear from but also interact with great personalities from such organizations by simply conducting a webinar. But under conventional method of education, it is nearly impossible to interact so frequently with such great personalities. Thus, online platforms act as blessing in disguise for students of technical education in terms of idea exchange.

The aim of the technical education is to apply the knowledge gained in inventing, innovating and improving structures to eliminate problems. It creates the ability to acquire and apply new knowledge as needed by the prevailing situation, using appropriate learning strategies. Now during the pandemic, the teachers and students are having problem as the regular teaching learning process has been interrupted. So being the sufferer we were at least able to think for better advancement of technology. It is said that a small problem can lead to so many innovative ideas. Thus, it has unfolded the opportunities to all those who are involved in the process of technical education; the learners, educators and the policy makers to alter their line of thinking so as to fulfill the objective of technical education in true sense. It has been rightly said that "For engineers challenges are opportunities". The success of technical education lies in converting the challenges imposed by the COVID-19 pandemic into the opportunities. It is the responsibility of the technical education sector to train, to guide, to motivate the learners for contributing towards invention of an educational technique in future with which both learners and educators would be compatible even in a situation of poor network connectivity and power shortage as these problems are commonly faced in backward areas. The advantage of such invention can be enjoyed by the students and teachers of other educational sectors too.

As the online era ushered, it brought with it the problems of network connectivity and power shortage which scores out many of the perks of online education. These problems are to be addressed on a war footing, so that the maximum benefit of e learning can be enjoyed by all. In this regard the name of great economist Professor Hirschman is mentioned here. He advocated the possibility of development via shortage of social and economic capital. When there is shortage, the social and political pressure compels the Government to supply the same. If e learning becomes a part and parcel of our education system, the power supply, network connectivity would be the urgent need of the country and then the Government would be compelled to invest for the supply of electricity and network, from which not only the student community but also the general people would be benefitted as a whole. Further, even though online classes have saved the time and cost required to reach the



school or college thereby enabling the students to utilize their saved time in productive activities yet the examples of using free time in some socially undesirable activities like creation of offensive web applications by some students of prestigious colleges have come to light. In an unprecedented situation created by the pandemic the mutual cooperation and coordination among the students, teachers and parents can only help to channelize the creativity of young learners in right direction. Further in a network enabled education system, some health related issues like strain on eyes, obesity due to lack of physical activities, pressure on mental health etc. have started to make their ugly appearances. These problems are to be handled through the consultation with health care providers. If required, qualified mental health professional is to be contacted for immediate counseling.

Since "limitations stimulate creativity", hence new ideas in the form of solutions are to be engineered so as to cope with the changing environment. We know that the students and teachers of technical education are the torchbearers of technological development. So, if we accept the technical changes right from the learning stage, then only the country can progress towards rapid technological advancements which is required for development of various sectors of the economy and e learning is the starting point of the journey of technological development of our country.

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## আজিৰ সত্য

**Mr. Ashutosh Barkataky**

*B. Tech (1<sup>st</sup> Semester, ME, 2021-25)*

মানুহ অগ্রগতিৰ শিখৰত আছি, বিজ্ঞানৰ কেন্দ্ৰবিন্দুত উপস্থিত হৈছেনি।

এটাতকৈ আনটো চ'ৰা বিজ্ঞানৰ বহস্য উদ্ঘাটনত

কিন্তু পাহৰি গৈছে মৰম চেনেহ অনবৰত। ভূপেনদাই লিখি থৈ গান, "মানুহে মানুহৰ বাবে", যাক ওলোটাই আছি হ'ল মানুহে বিজ্ঞানৰ বাবে। সৌজন্যহীন মানুহে বুজি পায় মাথোঁ লাভৰ অংক,

আন লগৰীয়া যেন তেওঁৰ বাবে কীট- পতংগ।

বীভৎসকর হৈ পৰিছে ধৰাখনি, তেজৰ বান্ধোন ছিড়ি আছি গঢ়িছে নানা খনি।

জীৱণৰ অর্থ বিচাৰি তুমি খোৱা হাবাথুৰি প্রকৃত শান্তি যে নিজৰ ওচৰতেই পাবা চোৱাচোন এবাৰ ঘূৰি।

সমগ্র ব্রহ্মাণ্ডৰ আতি - গুৰিত পাণ্ডিত্য এইসকলৰ

বুজা-বৃত্তি বিহীন এইসকল মানুহৰ।

ব্যস্ততাৰে ভৰা এই জীবন,

কাৰো কথা ভাবিবলৈ নাই সময় অকণ। এনেদনেই থাকিলে পৃথিৱী নিটিকিব বেছিদিন সময় আছে শিকো আহা জীৱনৰ বীণ।

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## TREE OF LIGHT

**Mr. Bedanga Chutia**

*B. Tech (5<sup>th</sup> Semester, ME, 2019-23)*

A student asked a yogi, "What advice would you like to give for our life?" He replied that accepting nature is the greatest truth of life. If you learn from the mistakes of life, admit your mistakes and follow the commands of nature, try to study nature then you will definitely succeed in life. All evil deeds, mistakes, regrets, past memory become useless when you enlighten yourself in pure knowledge. The student asked again, "Have you ever made a mistake in your life?" He replied that it is natural to make mistakes in human life. We all know that Valmiki was a modified version of Ratnakar bandit. Someone has to forget all materials used in ICU after getting discharged from hospital and all those memories of critical health become useless after recovery from illness. And yogi turned to his past emotionally. The student listened to him silently. People are amazed at the story of how my life has changed. There were many lessons to be learned from the mistakes made in my early life. I admit that if I hadn't done something wrong, I would not have learned a lot in life. I do not mean that you are to go home and willfully commit mistakes. My life began in the midst of a violent conflict. Getting love in the early stages of my life was the ultimate goal of my life. I spent a lot of time talking to beautiful girls. I had written many poems on the physical beauty of many girls. The student asked again, "What did you write?" He said, "With what hands did God create you! You are the fairy of heaven, Do you remember that we were good friends in the past life, the beauty of the sea, the light of the moon, the fragrance of spring do not compare to your beauty....." In this way.... He took a deep breath. Many of my friends were looking for trips after falling in love. One of my friends came to me, he said, " He was in love, but there is a problem, the girl already has a boyfriend." I told him not to worry, she has a boyfriend and not a husband! I'll give you the way, you have to obey. She will be yours. I soon became known as the 'love guru' among my friends. Friends used to come to me with almost the same problem, and I solved it. What a meaningless life was going.... I was very pleased to propose girl. If the answer was 'yes' then we had organized a party. And if the answer was 'no' then our new plan was starting. Until then, I didn't understand the meaning of life. It's like today's generation, just floating in the ocean of love. They don't really understand what love is. Love is the lifeblood. But people do not understand the true meaning of this. Love is not limited to just two people. A celibate person is also a lover of life. They love their lives; they have fallen in love with the human society. That is why he has sacrificed his life for the service and welfare of the human society. This time the student asks, "How did you start a new life, how can such a drastic change come into your life? You have taken the path of celibacy and are serving the society today." One day I suddenly met a very great celibate, a Yogi. His presence changed the way I thought. I started reading the ancient scriptures, the Upanishads. The way I look at life has changed. I learned to make friendship with nature. I started a new life again. The nature bears a natural sound which is none less than melodious music bits, which affect our subtle body & cures many diseases but you should bear enough faith in it. The early morning sounds of birds bear a healing power which directly affect our brain. Sounds of birds creates a positive vibration in the environment. In Bhagwat Gita Shree Krishna told Arjun, "I shall now reveal unto you fully this





knowledge and wisdom knowing which nothing else remain to be known in this world.” All students of the rising generation should acquire knowledge of our culture, scriptures, Upanishads. This is the demand of the time. Finally, the yogi left the place with some advice for the student’s life from his experience of Bhagwat Gita. While contemplating on the objects of the senses one develops attachment to them. Attachment leads to desire, and from desire arise anger. Elevate yourself through the power of your mind and not degrade yourself, for the mind can be the friend and also enemy of self. The contact between the senses and the sense objects given rise to fleeting perceptions of happiness and distress. There are non-permanent and come & go like the winter & summer season. One must learn to tolerate them without being disturbed. It comes out of the student’s mouth spontaneously, “Light always shines, he is the tree of light!”

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## নিস্কৃততা

**Mr. Abhinab Nath**

*B. Tech (5<sup>th</sup> Semester, ME, 2019-23)*

সৌ সোরণশিৰিৰ কাষৰ সন্ধিয়া বোৰষে  
মনত পৰিছে আজি,  
সোরণশিৰি লগত কটোৱা  
লা'ৰালিৰ স্মৃতিয়ে বৰকৈ আমনি কৰিছে।  
সেই শৈশৱ ,সেই সময় ,  
নদীৰ বুকুত কৰা খেল ধেমালি  
সেইয়া জানো উটি যোৱা নাই ?  
উচ্চ পদবীৰ হেমাৰি, দুৰ্নীতিয়ে  
জানো সকলো নিশেষ কৰা নাই ?  
আপোন বুলি ভবা ঘৰ খনো যেন আজি নাই,  
হম হম বুলি কৈ থকা মথাউৰিৰ যেন দেখা নাই,  
কেৱল নিস্কৃততা, হাজাৰ হাজাৰ মানুহৰ  
কান্দোন আৰু মৌনতা.....

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## ফাগুন

**Ms. Mridushmita Engtipee**

*B. Tech (1<sup>st</sup> Semester, IPE, 2021-25)*

কিনো কম সেই ফাগুনৰ মনোমোহা  
বতাহজাকৰ কথা। শুনিবলৈ পাওঁ সেই  
ফাগুনৰ বতাহজাকে হেনো প্ৰেমৰ বতৰা লৈ  
আহে , এইয়া সঁচা নে মিছা মই নাজানো ,  
কিন্তু এটা কথা মই নিজে অনুভৱ কৰো সেই  
বতাহজাকে যেতিয়া আমাৰ দেহ লাহেকৈ চুই  
যায় তেতিয়া একো কব নোৱাৰা এক মধুৰ  
অনুভৱ হয়। মোৰ মতে প্ৰেম এটা মধুৰ  
অনুভৱ হয় যাৰ কাৰণে ইয়াক ফাগুনৰ  
বতাহজাকৰ লগত তুলনা কৰা হয়, কাৰণ  
প্ৰেমৰ দৰে সেই মধুৰ অনুভৱ ফাগুনৰ  
বতাহজাকে দিয়ে। সেয়েহে কবিসকলে  
হ'বলা ফাগুনৰ বতাহজাকে হেনো প্ৰেমৰ  
বতৰা লৈ আহে এই কথাখিনি তেওঁলোকৰ  
কবিতাবোৰত লিখে। নাজানো মোৰ এই  
কথাষাৰ শুদ্ধ হয় নে নহয় , কিয়নো  
কবিসকলৰ প্ৰতিটো কবিতাত বহুত গভীৰলৈ  
ভাৱ নিহিত হৈ থাকে।

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## TRAVERSING LOVE

**Ms. Shreya Lopamudra**

*B. Tech (1<sup>st</sup> Semester, ME, 2021-25)*

At the age of eight,  
love for me was  
sitting on the same bench,  
and sharing textbooks  
during English periods;  
when hushed thank you's  
were equivalent to  
drunken I love you's.

At eleven,  
love was the honey dripping eyes  
of a boy who never looked at me twice; Except on a  
math test day  
when his asking me the value of y  
felt sheepishly close  
to him asking me out.

At sixteen,  
love finally loved me back.  
Love shapeshifted into letters  
and poems and kisses and  
touches on foreign landscapes.  
Except in the end,  
I folded my heart into a paper plane  
and love crushed it with its bare hands.

At twenty-three,  
I hope I fall in love with a boy  
I can share hospital benches with,  
who wouldn't need to ask the value of me,  
who can fold his heart into  
an origami of my favorite flower  
just to see me smile again.

Then at seventy,  
when Alzheimer's or arthritis  
will consume the best of us,  
I know love will turn subtle.  
Love will remind me of the morning pills,

## মোৰ স্বাভিমান

**Mr. Abinash Dutta**

*B. Tech (5<sup>th</sup> Semester, ME, 2019-23)*

সন্ধ্যাৰ ধূলি উৰুৱাই,  
গৰুবাটেৰে গৰুজাক আহিছে,  
৭০ কি ৮০!  
চেউৰী কি দমৰা!  
বাঙলী কি বগী!  
আজি বা কাৰ পাল?  
কিমান যে আশা!  
কিমান যে ভৰষা!  
হাবাথুৰি খাই আহিছে আই,  
চকুত সন্তোষ, মুখত হাঁহি,  
কাজলীজনীৰ ভাল পেট ভৰিছে।  
আজি ঠিক ৬০ টা বছৰৰ পিছত,  
মই সেইজোপা শেৱালীৰ তলতে বৈছো,  
য'ত বাঁহৰ জঁপনা গুচি কংক্ৰিটৰ গেট হ'ল,  
য'ত নাই আইৰ হেঁপাহ,  
পিতাইৰ ভৰষা।  
আৰু ঠিক আজি মই,  
সেইজোপা শেৱালী তলতে বৈছোঁ,  
য'ত গৰুবাটেৰে গৰুজাক নাই,  
তেল ঘঁহি পিছল কৰা হালোৱা এচাৰি ডাল,  
বাবুলৰ হাতত আৰু নাই।  
বহু বছৰে ভটিয়ালে,  
পথাৰখনিত খোঁজ পৰা নাই পিতাইৰ,  
বলধহালে আৰু হাল জুৰা নাই,  
হাতত কাঁচি, দীঘল চোলা,  
মেটমৰা ডাঙৰিৰ ভাৰ;  
সন্ধিয়াৰ হেঙুলী বেলিত,  
সোণালী পথাৰখনি আৰু নাই,  
আৰু নাই, আইৰ চকুত হাবিয়াস,  
লখিমীক আদৰাৰ প্ৰস্তুতি।  
আজি মই সেই বাটেৰে চাইছো,  
গুটি ধানৰ কেৰু-কেৰু....মেৰু-মেৰু গৰুগাড়ীখন,  
আহিছিল মোৰ চোতালৰ দিশে,



while reading out ghazals  
through his horn-rimmed glasses,  
love will trace treasure maps on my wrinkled skin  
and never forget to kiss my cheeks before he sleeps.  
at seventy, maybe,  
love will finally have a name.

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## মৰীচিকাৰ অনুভূতি

Mr. Partha Pratim Changmai

B. Tech (7<sup>th</sup> Semester, ME, 2018-22)

ধ্ৰুৱ তৰাৰ জ্যোতিষ্কৰে গোধূলিকা বেলী  
অকণিক আকল্প কৰে জোনবাই দেশলৈ বুলি।  
আকাশৰ সীমনা ভেদী চন্দ্রত খোজ দিয়া কণমানি  
আজি  
আশ্চৰ্য বিমূঢ় হৈ বয় নক্ষত্ৰৰ এই আলোকহীন  
তৰাক দেখি।  
দূৰ দিগন্তত উদ্ভৱিত দীপ্তি দেখি  
নদীৰ বুকু অতিক্ৰম কৰে নাৱৰীয়া কঁকাইটি।  
বালি চন্দাৰ চিকমিকণিৰ প্ৰতিফলনে  
তাৰ মনত যোগাই মৰীচিকাৰ অনুভূতি।  
হয়তো ব্যৰ্থ হ'ল কণমানিৰ কুৰি যুগৰ সাধনা  
তথাপি সেই আসক্তিয়ে দিলে জোনবাই দেশলৈ যোৱাৰ  
প্ৰেৰণা।  
হ'ব পাৰে নাৱৰীয়া কঁকাইটিৰ মনৰ আকুলতা  
তথাপি সেই উৎকণ্ঠাই জগালে বহল নদী পাৰ হোৱাৰ  
উৎসুকতা।  
নিয়তিয়ে ব্যক্ত কৰিলে নেদেখা আঁৰৰ সত্যতা  
যি সত্যৰ অনুসন্ধান জীৱন কৰি তুলে ৰহস্যৰ ৰসঘৰা।  
উন্মাদনাৰ শিবিৰত প্ৰাণ পাই উঠে অক্লান্ত মনৰ শিখা  
যাৰ প্ৰৱনতাই দিয়ে জীয়াই থকাৰ স্পৃহা।।

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আনিছিল আশাৰ বীজ, ভোগালীৰ ভোগ,  
আৰু মোৰ জাতিৰ স্বাভিমান।  
আজি মই সেই বাটেৰে চাইছোঁ,  
যি বাটেৰে পিতাই মোৰ দুহাতত গুজি দিছিল,  
সেউজী পথাৰখনি,  
সপ্তাহিক বজাৰখনি,  
মোৰ অধিকাৰ,  
মোৰ প্ৰাপ্য।  
সি কাহানিও তাৰ নাছিল,  
সি নাছিল,  
কোনো পুঁজিপতি বণিয়াৰ হাতৰ মলি,  
সি মোৰ উশাহ আছিল,  
মোৰ প্ৰাণ আছিল,  
আৰু আছিল মোৰ গৌৰৱ।  
আজি মই সেই বাটেৰে আগুৱাম,  
আঁজুৰি আনিম মোৰ পথাৰখনি,  
কাঢ়ি আনিম মোৰ বজাৰখনি,  
য'ত থাকিব মোৰ অস্তিত্ব,  
মোৰ স্বাভিমান,  
মোৰ গৌৰৱ।  
এইয়াই মোৰ অস্তিমটো সিদ্ধান্ত,  
এইয়াই মোৰ স্বাধীনতাৰ প্ৰথমটো চৰ্ত,  
এদিন বজ্ৰ কণ্ঠে চিঞৰিম,  
আকাশ কঁপাই.....  
পিতাই চা,  
পথাৰখনি মোৰ,  
বজাৰখনি মোৰ।  
আই চা,  
তোৰ দুচকু জুঁৰাই,  
মোৰ স্বাভিমানক আদৰিবলৈ,  
কান্ধত গামোচা লৈ,  
ভঁৰালৰ আগত,  
মইয়ে তোৰ গৌৰৱ।

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## SPONSORED RESEARCH PROJECTS

The following table provides a list of the ongoing sponsored research projects undertaken by the faculty members of the department. The cumulative value of the projects is ₹327.18 L (approximately).

Sl no.	Project title	PI Name	Co-PI Name	Duration	Funding agency	Sanctioned date	Amount (Rs)
1	Investigation of thermal management system of heat pipe/PCM based Li ion battery packs	Mr. Subhransu Shekar Mallick	Dr. Dimbendra Mahanta and Dr. Jnana Senapati	14 months	NPIU under TEQIP-III	18/06/2019	881000
2	A comparative study of performance of solid lubricants in WC cutting tools	Dr. Anil Borah	-	3 years	AICTE – RPS	14/08/2020	2038824
3	Development of a novel endotracheal tube holder for better management in invasive ventilation	Devarshi Kashyap	Dr. S. Kanagraj and Dr. Apurba Bohra	14 months	NPIU under TEQIP-III	18/06/2019	1700000
4	Development of Actuator for shedding mechanism in looms	Juan Chowdhury	Dr. Plabon Kakoty, Dr. Karuna Kalita and Dr. Gaurav Kumar	14 months	NPIU under TEQIP-III	18/06/2019	1460000
5	Plastic waste driven IC engine	Dr. Abhimanyu Kar	Dr. Dimbendra Mahanta, Dr. Raghubans Singh	14 months	NPIU under TEQIP-III	18/06/2019	881000
6	Design, Development and simulation of Nanoelectrofuel flow batteries for their application in EV's	Jyothis A	Jitul Baruah and Dr. P. Karthikeyan	14 months	NPIU under TEQIP-III	18/06/2019	1140000



7	Developing sustainable substitutes for plastic carry bags and packaging materials	Dr. Pradip Baishya	-	3 years	AICTE – RPS	14/03/2019	24550000
8	Development of an Index for ranking of cements	Dr. Plabon Kakoti	-	1 year	CRS ASTU- TEQIP-III	16/07/2019	260000
9	Computational Investigation of Perforated Hollow Shape Energy Efficient Elliptical Pin Fin Heat Exchanger	Monoj Baruah	Dr. Kalyan Kalita	1 year	CRS ASTU- TEQIP-III	17/07/2019	300000
10	Production and characterisation of biodiesel from waste cooking oil of Assam engineering college and investigation of its CI engine performance and emissions for running its own DG sets	Prasanta Kumar Choudhury	Dr. Bharat Kakoti	1 year	CRS ASTU- TEQIP-III	17/07/2019	299930

**NB:** In view of the COVID-19 pandemic the duration of some of the projects has been extended by the funding agencies.

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*"Don't sit down and wait for the opportunities to come.*

*Get up and make them."*

—Madam C.J Walker



## PUBLICATIONS OF FACULTY MEMBERS IN 2021

### Dr. Pradeep Kumar Mahanta

1. Rajiv Lochan Bikash Roy, Dr D K Mahanta, **Dr. P K Mahanta** "A Comparative Study of Rotary Drum, Barrel and Pit Composting using Municipal Solid Waste of Guwahati City" Compliance Engineering Journal page 159- 168 vol 1 issue 8 2021 ISSN No 0898-3577
2. Mridul Deka, **Pradeep Kumar Mahanta**, Nabajit Dev Choudhury "Effect of EGR on Performance and Emission Characteristics of a Diesel Engine fuelled with yellow Oleander Seed Oil Biodiesel" Book Chapter of: Advances in Thermofluids & Renewable Energy Springer Singapore Oct 2021

### Dr. Niharendu Saha

1. Nabajit Deb Choudhury, **Niharendu Saha**, Biswaranjan Phukan and Rupam Kataki, 'Characterization and Evaluation of Energy properties of Pallets production Coir pith, sawdust and Ipomoea carnea and their blends', Energy Sources Part A: Recovery, Utilization and Environmental Effects (Taylor and Francis Group) 2021, 1-18.

### Dr. A Borah

1. Bhuyan M., **Borah A.**, "Investigating the Effect of water Cooling on Hardness of 2XXX Series Al-Alloy Micro Alloyed with 0.02 and 0.04 wt% of Titanium", Materials Today: Proceeding, 2021, Elsevier Publication, Vol. 43, Part 1, pp.689-693.
2. Monoj Baruah, **A. Borah**, "Effect of Solution Treatment on Ageing Behaviour of Al-Mg-Si-Sn Alloy" Advanced Engineering Forum Submitted: 2020-06-29 ISSN: 2234-991X, **Vol. 39, pp 1-8** Revised: 2020-11-17 © 2021 Trans Tech Publications Ltd, Switzerland Accepted: 2021-01-11 Online: 2021-02-24.
3. Monoj Baruah, **A. Borah**, "On the enhancement of wear resistance of Al-Mg-Si alloy via micro-alloying Sn" Sādhanā (2021) P 46-129, Indian Academy of Sciences (<https://doi.org/10.1007/s12046-021-01655-8>Sadhana)
4. Monoj Baruah, **A. Borah**, "Structure-property correlation of Al-Mg-Si alloys micro-alloyed with Sn", Published online: 22 July, 2021, International Journal of Metal casting

### Dr. D. K. Bora

1. Chinmoy Jit Sarma, Bhaskor J Bora, **Dilip K Bora** and Bhaskar J Medhi, Effect of compression ratio on performance and emission characteristics of a rubber seed biodiesel run diesel engine, 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. FMFP2021-11-306

### Mr. Prasanta Kumar Choudhury

1. **Mr. P K Choudhury**, Mr. N Kashyap, "Application of taguchi-dear method for parametric optimization of CI engine performance and emission with waste cooking oil biodiesel" *International Conference on Modeling, Simulation and Optimization (CoMSO2021)*, NIT Silchar, 16<sup>th</sup> to 18<sup>th</sup> Dec'2021, Book chapter of Modeling and Analysis of Sustainable Renewable Energy Systems, Book series: Lecture Notes in Energy, Springer (indexed in Scopus) <https://www.springer.com/series/8874>

### Dr. Manash Hazarika

1. **Manash Hazarika**, 2022, "An improved genetic algorithm for the machine-part cell formation problem". Int. J. Syst. Assur. Eng. Manag, DOI: 10.1007/s13198-021-01615-9



### **Mr. Piyush Singh**

1. Tiwari, A., Pankaj, P., Suman, S., **Singh, P.**, Biswas, P., Pal, S., Rao, A.G. Effect of plasma preheating on weld quality and tool life during friction stir welding of DH36 steel. Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture. 2021;235(9):1458-1472. doi:10.1177/0954405421990139
2. Kutum R., **Singh P.**, Saha A. (2021) Experimental Study on Recycled Polyethylene Terephthalate (PET) Bottle Fibre Reinforced Concrete. In: Kalamdhad A.S. (eds) Integrated Approaches Towards Solid Waste Management. Springer, Cham. [https://doi.org/10.1007/978-3-030-70463-6\\_9](https://doi.org/10.1007/978-3-030-70463-6_9)
3. Kutum R., **Singh P.**, Saha A. (2021) Comparative Study of Jute Fiber and PET Fiber-Reinforced Concrete. In: Bora P.K., Nandi S., Laskar S. (eds) Emerging Technologies for Smart Cities. Lecture Notes in Electrical Engineering, vol 765. Springer, Singapore. [https://doi.org/10.1007/978-981-16-1550-4\\_16](https://doi.org/10.1007/978-981-16-1550-4_16)

### **Mr. Jyothis A**

1. Marappana, M., Vijayakrishnan, MK., Palaniswamy, K., Manoharan, K., Kumaresan, T., **Arumughan J.** Experimental investigation on serpentine, parallel and novel zig-zag flow fields for effective water removal and enhanced performance on 25 cm<sup>2</sup> PEMFC Journal of Ceramic Processing Research February 2021 Pages 131-142 Volume 22 <https://doi.org/10.36410/jcpr.2021.22.2.131>

### **Mr. Anirban Saha**

1. Kutum R., Singh P., **Saha A.** (2021) Comparative Study of Jute Fiber and PET Fiber-Reinforced Concrete. In: Bora P.K., Nandi S., Laskar S. (eds) Emerging Technologies for Smart Cities. Lecture Notes in Electrical Engineering, vol 765. Springer, Singapore. [https://doi.org/10.1007/978-981-16-1550-4\\_16](https://doi.org/10.1007/978-981-16-1550-4_16) Print ISBN 978-981-16-1549-8 Online ISBN 978-981-16-1550-4
2. Kutum R., Singh P., **Saha A.** (2021) Experimental Study on Recycled Polyethylene Terephthalate (PET) Bottle Fibre Reinforced Concrete. In: Kalamdhad A.S. (eds) Integrated Approaches Towards Solid Waste Management. Springer, Cham. [https://doi.org/10.1007/978-3-030-70463-6\\_9](https://doi.org/10.1007/978-3-030-70463-6_9) Publisher Name Springer, Cham Print ISBN 978-3-030-70462-9 Online ISBN 978-3-030-70463-6

### **Mr. Subhransu Sekhar Mallick**

1. **S S Mallick**, S Neog, D K Mahanta and M Rafi, A review on passive cooling techniques for lithium-ion battery thermal management system of electric vehicle, IOP Conf. Series: Materials Science and Engineering, 2021, 1145, 012046, doi:10.1088/1757-899X/1145/1/012046

### **Mr. Manash Bhuyan**

1. **Bhuyan., M.**, Borah., A, "Investigating the Effect of water Cooling on Hardness of 2XXX Series Al-Alloy Micro Alloyed with 0.02 and 0.04 wt% of Titanium", Materials Today: Proceeding, 2021, Elsevier Publication, Vol. 43, Part 1, pp.689-693.

### **Mr. Manoj Baruah**

1. **Baruah, M.**, Borah, A. On the enhancement of wear resistance of Al-Mg-Si alloy via micro-alloying Sn. Sādhanā 46, 129 (2021). <https://doi.org/10.1007/s12046-021-01655-8>
2. **Baruah, M.**, Borah, A. Structure–Property Correlation of Al–Mg–Si Alloys Micro-alloyed with Sn. Inter Metalcast (2021). <https://doi.org/10.1007/s40962-021-00652-1>
3. **Baruah M**, Borah A. Effect of Solution Treatment on Ageing Behaviour of Al-Mg-Si-Sn Alloy. AEF 2021; 39:1–8. <https://doi.org/10.4028/www.scientific.net/aef.39.1>.

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## YEAR 2021 AT A GLANCE

### Pratul Chandra Baruah Merit Award Scholarships 2022 for UG (Mechanical)

- Ripunjoy Kalita: Senior PCB Scholar (7<sup>th</sup> and 8<sup>th</sup> Semester)
- Manas Pratim Das: Junior PCB Scholar (5<sup>th</sup> and 6<sup>th</sup> Semester)
- Abhinav Nath: Sophomore PCB Scholar (3<sup>rd</sup> and 4<sup>th</sup> Semester)
- Pragyant Jyoti Saikia: Freshman PCB Scholar (1<sup>st</sup> and 2<sup>nd</sup> Semester)

### List of awardees AEC Merit Award Fund

SL NO.	SEMESTER	NAME OF STUDENT	AWARD
1	3 <sup>rd</sup> SEMESTER	ABHINAB NATH	ANIL ANAND AWARD
2	4 <sup>th</sup> SEMESTER	ABHINAB NATH	BRANCH TOPPER
3	5 <sup>th</sup> SEMESTER	MANASH PRATIM DAS	BRANCH TOPPER
4	6 <sup>th</sup> SEMESTER	MANASH PRATIM DAS	PITAMBOR GOSWAMI AWARD
5	7 <sup>th</sup> SEMESTER	KAUSTOBHMONI HAZARIKA	ANIL ANAND AWARD
6	8 <sup>th</sup> SEMESTER	KAUSTOBHMONI HAZARIKA	PROF. A K PADMAPATI AWARD FOR BEST ME GRADUATE

### List of students (2017-21 and 2018-22 batch) placed through placement drives organized by the Training & Placement Cell during Jan 2021- Jan 22 (Updated till 07/01/2022)

SL NO.	COMPANY NAME	SELECTED STUDENT(S)
1	ANGLO EASTERN SHIP MANAGEMENT COMPANY	JISHNU SAIKIA
2	CALICHE PVT. LTD.	MANASHJYOTI SARMAH
3		MANAN SARMA
4		TOHIDUR ISLAM MONDAL
5		ANGARAAJ DAS
6		NAVEEN KUMAR PANDEY
7		DEBABRAT GOGOI
8		MANASHJYOTI SARMAH
9	COGNIZANT	PRERONA DEY
10		SUBHRANEIL SARMAH
11		NILANJAN BANERJEE
12		ABHILASH BORUAH
13		SAHDAT AHMED KHAN
14		CHANAKYA MEDHI
15		SOUMYA SARKAR
16		ARITRA DUTTA
17	DALMIA CEMENTS	RAJARSHI BAYAN
18		SNIGDHA BORA
19	DENSO	NAVEEN KUMAR PANDEY
20		BIKASH DAS
21	GODREJ & BOYCE	ABHILASH DAS
22		BITU CHUTIA
23		PRASENJIT KALITA
24	INDRADHANUSH GAS GRID LIMITED (IGGL)	SAPTARISHI SIKDER
25		SHASHANK LASKAR
26	INFOSYS	MAAH-E-JABEEN RABBANI
27		SATYAM SARMA
28	JARO	RONI HAZARIKA
29	MAX CEMENT	MANASH JYOTI LAHON
30		KALPADEEP NANDI
31	SUPREME INDUSTRIES	NITUL TUMUNG
32		ABHILASH DAS
33		DEBASHIS SAIKIA





34		NITUL TUMUNG
35		SIDHARTHA BORDOLOI
36		APALAK SHARMA
37	TATA ADVANCE SYSTEM LTD.	MAAH-E-JABEEN RABBANI
38		ANUBHAV KUNDU
39		ANKIT TIWARI
40		AVEGAROHAN JAISWAL
41		RAJARSHI BAYAN
42		BIDYUT KALITA
43		SANJIB SHAH
44		JITUMANI KUMAR
45		DEEPLYOTI PATOWARY
46		ABHILASH BORUAH
47	VEDANTA	ABHINASH BAISHYA
48		ANGARAAJ DAS
49		ASHISH JAIN
50		DEBABRAT GOGOI
51		MILAN PRIYA BORA
52		MONORANJAN RABHA
53		PARTHA PRATIM CHANGMAI
54		SATYAM PARASHAR
55		VIVIAN DAS BARMAN
56	VEDANTU	DEBASISH SAIKIA
57	WYREFLOW	ABILASH BARUAH

## PhD awarded in the department

SL NO	NAME OF STUDENT	GUIDE(S)	THESIS TITLE
1	BASHAB JYOTI PHUKAN	DR. S K DEB	SOME ASPECTS ON PERFORMANCE IMPROVEMENT OF AIR CONDITIONING SYSTEM
2	BISHWAJIT SHYAM	DR. D K BORA (GUIDE) & DR. K KALITA (CO-GUIDE)	WEAR ANALYSIS OF SINGLE CYLINDER FOUR STROKE DIESEL ENGINE USING BIODIESEL

## Student achievements



**Arindam Kashyap Ray** (B. Tech 5<sup>th</sup> Sem, ME) & **Angaraaj Das** (B. Tech 7<sup>th</sup> Sem, ME) secured 2<sup>nd</sup> position in Science and Technology Quiz organized by North East Centre for Technology Application and Reach, in association with Vijnana Bharati and Unnat Bharat Abhiyan.



**Arindam Kashyap Ray** (B. Tech 5<sup>th</sup> Sem, ME) & **Deepjyoti Patowary** (M. Tech, 1<sup>st</sup> SEM, ME) secured 3<sup>rd</sup> position in Central Zone Round of Red Ribbon Quiz organized by Assam State Aids Control Society.



**Arindam Kashyap Ray**  
(B. Tech 5<sup>th</sup> Sem, ME)  
secured 3<sup>rd</sup> position in  
Raihan Shah Memorial  
National Quiz 2021  
organized by Doom  
Dooma College,  
Tinsukia in online mode.

**Deepjyoti Patowary** (M. Tech, 1<sup>st</sup> SEM, ME) with Dhritiraj Misra secured 2<sup>nd</sup> position in All Assam Online Quiz Competition organized by Gauhati University NSS Cell

**Chess-Results.com** the international Chess-Tournament

In close cooperation with the Administrations and Pairing-program Swiss-Manager

Home: Tournament Database / AUT championship Pictures / FAQ Online English

**Late Bharat Ratna Atal Bihari Vajpayee**

Participated & ranked 5<sup>th</sup> in "Late Bharat Ratna Atal Bihari Vajpayee One Day Rapid Chess Tournament" organised by Sevabrata (NGO) & Jalukbari Yuva Suraksha Moncha was held on 25<sup>th</sup> December, 2021 at Ananda Nagar Youth Club, Pandu.

Rk.	SNo.	Name	FED	Rtg	Pts.	TB1	TB2	TB3
1	1	Lidzeta Gogoi	IND	1643	2.5	9.5	8.0	8.50
2	5	Ditya Jyoti Bora	IND	0	3.0	10.5	9.0	7.75
3	2	Ambar Jyoti	IND	0	3.0	9.5	7.5	6.00
4	12	Saigob Dhar	IND	0	3.0	8.0	7.0	5.50
5	7	Iqbal Hussain	IND	0	3.0	7.5	6.5	3.00
6	9	Priyans Das	IND	0	2.5	6.5	6.0	3.00
7	13	Shivam Duka	IND	0	2.0	10.5	8.5	4.75
8	11	Rubi Dhar	IND	0	2.0	9.5	8.0	4.00
9	4	Dheeba profi Sengupta	IND	0	2.0	7.5	7.0	3.00
10	8	Joydeep Dhar	IND	0	2.0	7.5	7.0	3.00
11	6	Gurjan Adhikari	IND	0	2.0	6.0	5.0	3.00
12	14	Siddharth Dhar	IND	0	1.0	9.5	8.0	2.00
13	3	Ayushrita Paul	IND	0	1.0	8.5	7.5	0.00
14	15	Souvik Majumder	IND	0	1.0	7.5	7.5	2.00
15	17	Rashid Dhar	IND	0	1.0	7.0	6.0	3.00
16	10	Purnav Dhar	IND	0	0.0	8.5	7.5	0.00
17	16	Subha Das	IND	0	0.0	6.5	5.5	0.00

**Iqbal Hussain** (B. Tech, 5<sup>th</sup> Sem, ME) participated & ranked 5<sup>th</sup> in "Late Bharat Ratna Atal Bihari Vajpayee One Day Rapid Chess Tournament" organised by Sevabrata (NGO) & Jalukbari Yuva Suraksha Moncha was held on 25<sup>th</sup> December, 2021 at Ananda Nagar Youth Club, Pandu.



**Team Elysian 3.0** won the Best Business Plan and Innovation at Efficycle 2021. Also secured overall All India Rank 6.

**Team members:** Vivian Das Barman (Captain), Prerona Dey (Vice Captain), Shashwati Baragohain, Kritartha Sarma, Dixeeta Mudiar, Hrishikesh Bharadwaj, Siddhartha Das, Ritu Parna Das, Sahil Ahmed, Abhinab Nath, Arindam Kashyap Ray, Gayatri Sharma, Luit Baglari

**Faculty in charge:** Mr. Subhransu Sekhar Mallick, Assistant Professor, MED, AEC Guwahati

Samridwhi Saikia (B. Tech 3<sup>rd</sup> Sem) was awarded "Best Cadet in group discussion" in Combined Annual Training Camp NCC 2021 held in Narangi Military Camp (16/11/2021 to 25/11/2021). 10 cadets from Assam Engineering College (30<sup>th</sup> Assam Battalion) participated in the Group discussion in which the topic was "Should Indian economy be privatised?".



## Faculty achievements



Dr. Anil Borah (Professor, MED) successfully completed the NPTEL Online Certification for the course "Ethics in Engineering Practice" with consolidated score of 87% (Elite) and was ranked in the top 2% of the candidates.



**Elite**

**NPTEL Online Certification**  
(Funded by the Ministry of HRD, Govt. of India)

This certificate is awarded to  
**ANIL BORAH**  
for successfully completing the course  
**Ethics in Engineering Practice**  
with a consolidated score of **87 %**  
Online Assignments 24/17/25 | Proctored Exam 63/75  
Total number of candidates certified in this course: 1029

Prof. G. P. Raja Sekhar  
Dean, Continuing Education  
IIT Kharagpur

Aug-Oct 2021  
(8 week course)

Prof. Debjani Chatterbori  
Executive NPTEL  
IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam

Roll No: NPTEL21MG60513570231

To validate and check scores: <https://npTEL.ac.in/noc>



Scientific Solid Waste Management Plant at Maa Kamakhya Devalaya was inaugurated by Chief Minister of Assam Dr. Himanta Biswa Sarma on 5<sup>th</sup> November 2021. The whole project is designed and developed by Dr. Pradip Baishya, Associate Professor, MED, AEC Guwahati. This project is funded by Maa Kamakhya Devalaya under Swachh Kamakhya Project amounting around 1.3 Crores. The plant has been designed to cater to the waste of Maa Kamakhya Devalaya and the households in the vicinity of the temple. The floral waste is converted into incense sticks and Compost. The kitchen waste is also converted into organic compost. The other non-biodegradable wastes are converted into paver blocks and semi processed for sending it to the recycling industries. This plant is a revenue earning project alongwith other benefits of elimination of landfill, carbon and green house gas reduction.

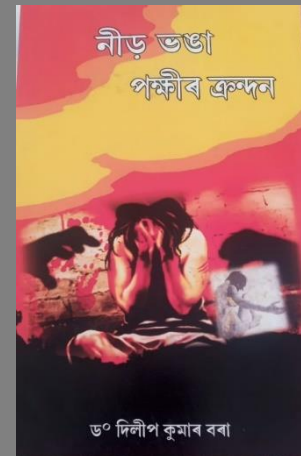
This is the first scientific solid waste management plant in Guwahati and fourth in Assam which was designed and developed by Dr. Pradip Baishya. Three other plants are already operating in Bongaigaon, Sapatgram and Abhayapuri.



Dr. Devarshi Kashyap (Assistant Professor, MED) was awarded PhD by IIT Guwahati for his thesis titled “Development of Porous and Patient Specific Shape Memory Polymer Composites as an Embolic Agent for Endovascular Embolization”. He was guided by Dr. S. Kanagraj (Professor, Mechanical Engineering Department, IIT Guwahati).



Dr. Dilip Kumar Bora (Professor, Mechanical Engineering Department, AEC Guwahati) authored a book titled “Neer bhanga Pakhir Krandan”. The book is a collection of fifteen short stories based on some actual events in the society and his experiences during his years of association with Assam Engineering College, Guwahati and Jorhat Engineering College. It was published in February 2021.



## Departmental news, activities and events

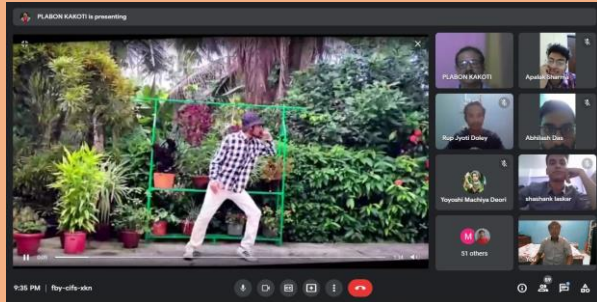


Dr. Dimbendra Kumar Mahanta (Professor, MED) accepted transfer to Mechanical Engineering Department, Jorhat Engineering College. His absence in the Mechanical Engineering Department, AEC Guwahati will be felt by one and all in the department. The students, faculty and staff of the Mechanical Engineering Department express their heartfelt appreciation and gratitude to Prof. Mahanta for his dedicated service over the years. You embody hard work and optimism. Thank you for sharing your knowledge and guiding us with your wisdom. You'll be missed but never forgotten!

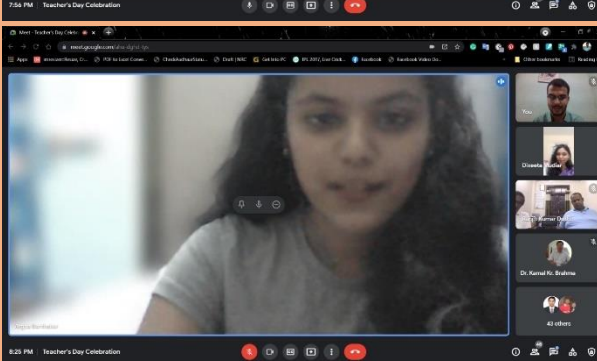
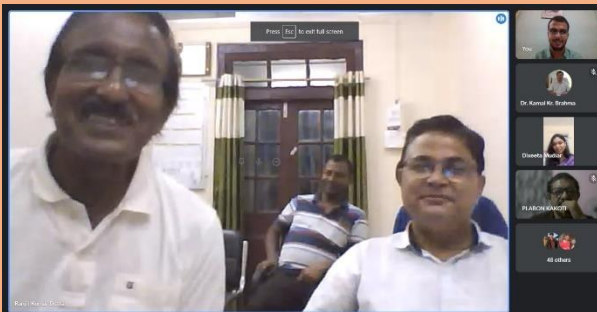


Dr. Pradeep Kumar Mahanta joined as Professor in the Mechanical Engineering Department, AEC Guwahati. His areas of interest include Mechanical System Design and Energy. Prior to this he held the position of Professor in the Mechanical Engineering Department at Jorhat Engineering College, Garmur (Jorhat).

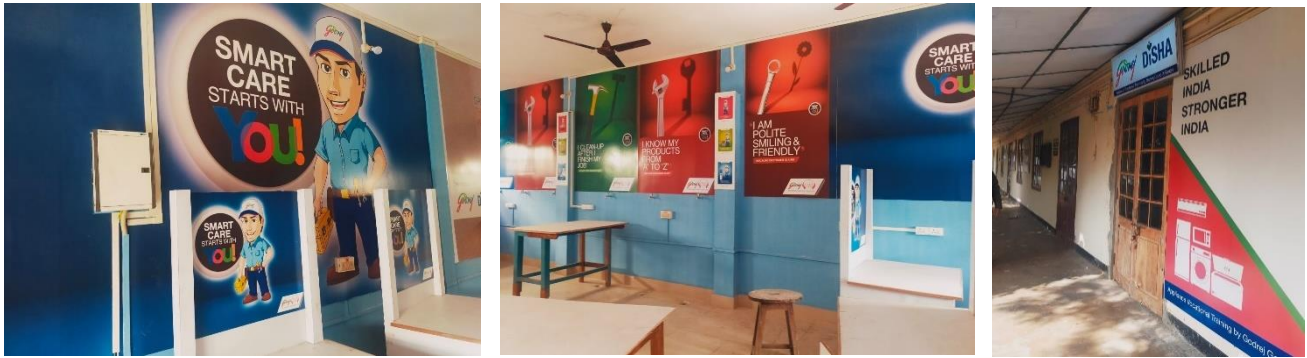
- Due to the restrictions due to COVID-19 pandemic the new members joining the department in the UG and PG courses were welcomed into the department by organizing online induction programs.
- The Final End Semester Examination for the outgoing batch 2017-21 under ASTU was conducted in the online mode by the department successfully in a smooth manner.
- The department adapted well to the requirements for online teaching and evaluation. The department maintained constant communication with stakeholders to gather feedback and improve the teaching- learning process.



The farewell of the outgoing UG (ME & IPE) batch 2017-21 was organised in online mode due to COVID-19 pandemic. However, the enthusiasm and participation from students and teachers saw no change. The program was replete with musical & dance performances, singing and recitation of poems. The students also shared candidly their experience of the four years in the college.



The students organised a wonderful event to celebrate Teachers' Day in the department on 5<sup>th</sup> September 2021



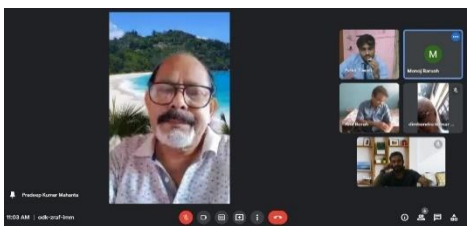
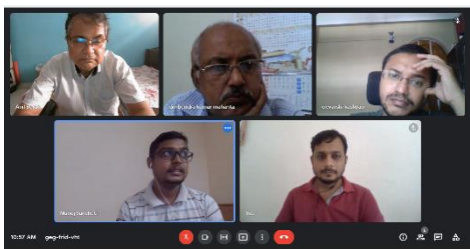
A vocational training centre was developed by the Godrej & Boyce Company in association with the Mechanical Engineering Department under the “Godrej Disha” initiative– the vocational training program of the group - and aims at improving lives of India’s underprivileged youth by training them in skilled employment, in line with the Government’s National Skill Development Mission.



New instruments and equipment were procured and installed in the Material Science Laboratory of the department.



Staff members of the department underwent in-house demonstration and training on equipment installed at Multi Skilling and Sustainability Centre (AEC Guwahati)



The BE final year project evaluation was organised in the department in online mode. External examiners were invited from industry and academia to be part of examination panels for the evaluation. The Grand Viva for the final semesters students was also organised. The terminal university examination was also coordinated by the department in online mode.



## PHOTO GALLERY 2021



