SEP
2023

CIVILOHOLIC

BY DEPARTMENT OF CIVIL ENGINEERING

VOLUME
3

DR. B.C. ROY ENGINEERING COLLEGE

DURGAPUR

Editor's Message

Dear Readers,

Its gives us immense pleasure to announce the third edition of our departmental E-magazine '**CIVILOHOLIC**'. We are proud and hopeful that the magazine would surely unfold the most innovative ideas of the students and the faculty members of our organization.

The magazine is to be viewed as a launch pad for the student's creative urges to blossom naturally. As the saying goes, mind like parachute works best when opened. This humble initiative is to set the bored and budding minds free allowing them to roam freely in the realm of imagination and experience. The enthusiastic work of our young writers and experienced faculty members are undoubtedly sufficient to hold the interest and admiration of the readers. We believe that success depends on the power to observe, perceive and explore. The magazine comprises contents related to technical aspects of Civil Engineering as well as poems, photography etc. We are sure that the hard work, positive attitude, continued relentless efforts and inventive ideas exhibited by our students to bring excellence to this treasure of trove would surely stir the mind of the readers.

The herculean task of editing this magazine would not have been possible without the sincere support of *Prof.* **Koyndrik Bhattacharjee,** *Prof.* **Anupam Biswas** and the editorial team of 3rd year students **Shubhasis Paul, Rethik Das & Subir Ghosh**. It is a fine thing to have the ability but the ability to discover ability in others is the true test. I am thankful to all my co-editors who dipped in the turbulent water of the magazine and sailed it to the shore of publication. I am thankful to our *Head of the Department* **Dr. Sanjay Sengupta**, to give me the opportunity to be the editor of this magazine. Also I am thankful ***to Dr. Sanjay S. Pawar (Principal), Dr. K. M. Hossain (Vice-Principal)*** for their continuous support. I heartily wish all the readers my best wishes and hope this magazine will enjoy your critical acclaim and prove itself best.

SHUBHASIS PAUL
Chief Editor, Civiloholic
4th Year Student, Civil Engineering
DR. B.C. ROY ENGINEERING COLLEGE, DURGAPUR

OVERVIEW OF CIVIL ENGINEERING DEPARTMENT

VISION

To transform the department into a global center of learning through synergic application of understanding, creativity, innovation and discipline.

MISSION

Our core mission is to educate, inside and outside the classroom to achieve excellence in education and train the leaders of tomorrow.
Our undergraduate degree programmed aims to provide a great platform for learning by offering variety of subject choices covering broad/frontier areas of civil engineering.

OVERVIEW

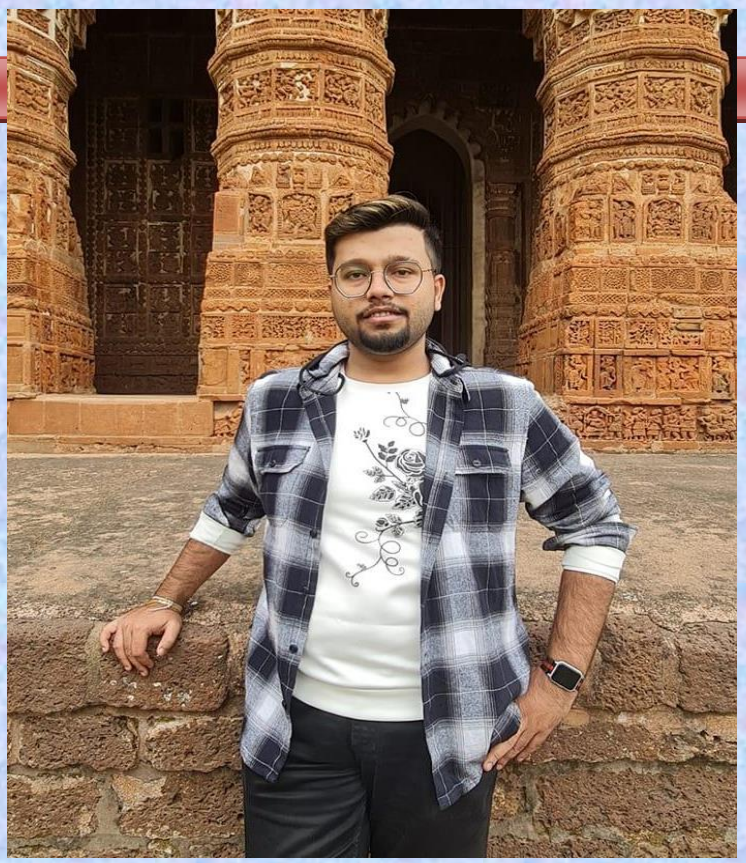
Civil engineers shape the physical environment from the cities and buildings we live in, the way we travel such as the highway networks, bridges, railways, tunnels, the dams and water systems, the power plants and transmission towers, and what not. Civil Engineering is a profession wherein the knowledge of mathematical and physical sciences, gained through the study and experiments, are applied to utilize economically the materials and forces of nature in the design & construction of appealing, functional and safe structures for the progressive wellbeing of humanity.

LABORATORIES

- **Solid Mechanics Lab**
- **Surveying and Geometrics**
- **Fluid Mechanics Lab**
- **Engineering Geology Lab**
- **Soil Mechanics Lab**
- **Concrete Technology Lab**
- **Computer Aided Drawing Lab**
- **Water Resource Engineering Lab**
- **Environmental Engineering Lab**
- **Material Testing Lab**
- **Highway & Transportation Engg. Lab**

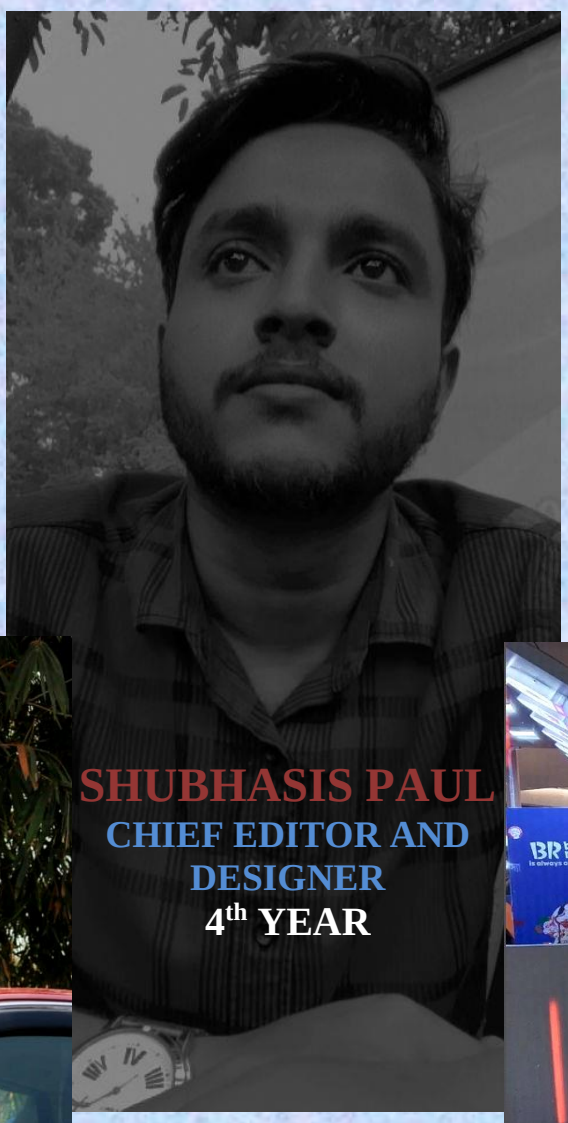
ADVISORY COMMITTEE

Prof. **Anupam Kr. Biswas**
Civil Engineering Department



Prof. **Koyndrik Bhattacharjee**
Civil Engineering Department

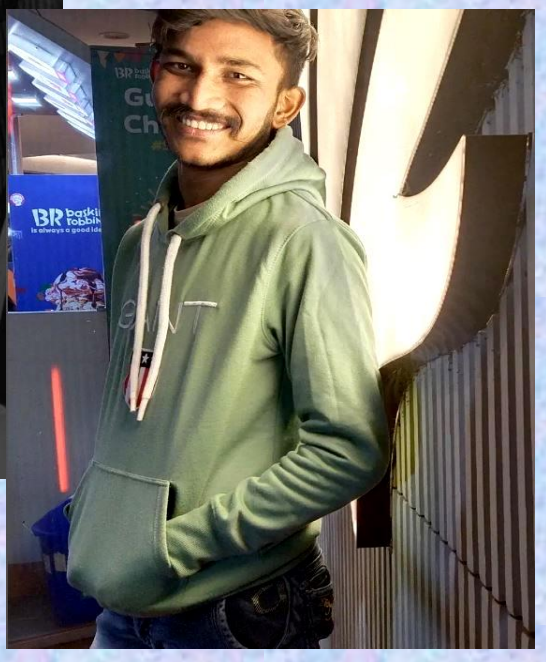
The Editorial Team



SHUBHASIS PAUL

CHIEF EDITOR AND DESIGNER

4th YEAR



Engineer's Day Celebration

This **Poster Competition Program** was organized on 15th September, 2022 from 10.30a.m by Civil Engineering Dept. in BCREC campus. It was based on the **Celebration of Engineer's Day**. On that day we all students of Civil Engineering Dept. were participated on that poster competition program.

Canal Visit Programmed By Civil Engineering Dept.

On 13th August 2022, we had a site visit organized by our *Ast.Prof.* **Pranoy Roy** and *Ast.Prof.* **Anupam Kr. Biswas.** The site located at **11 Mile Bus stand** (Bonkati Rd, Radhamohanpur, Birbhum, West Bengal 713152). It is the construction of a ***Canal design*** under "*Concrete Engineers Co-operative society pvt. Ltd*". Its civil engineer is **Monojit Metya.**

CSIR-CMERI Visit

On 19th Oct 2022 3rd year B.Tech. Students of Civil Engineering Department Dr. B C Roy Engineering College visits water testing facility lab of Environmental Engineering Group, CSIR-CMERI Durgapur Office. Here the students were given brief presentation about Water Testing Facility Lab equipments and process by the chief scientist of CSIR-CMERI Dr. Biswajit Ruj. Students were demonstrated with modern equipments and plant like domestic iron filters, arsenic removal plants, atomic absorption spectroscopy etc.

After this visit students reached at MSW Management Pilot Plant at CSIR-CMERI colony where they were demonstrated with integrated MSW disposal system, segregation system, biogas plant, low cost brick manufacturing units.

5 Days FDP ACE- 2022

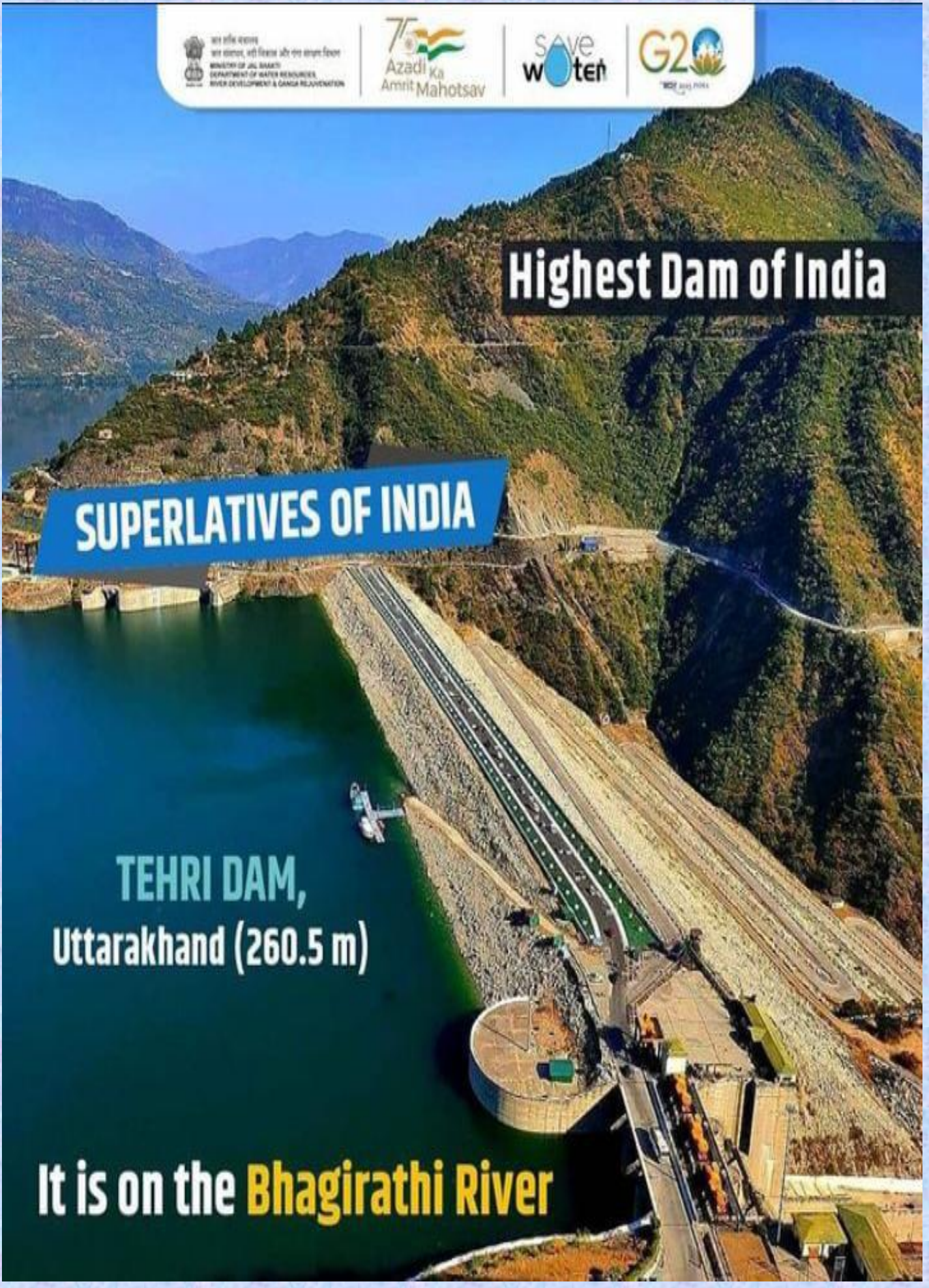
From 14th to 18th November, 2022 a Faculty Development Program was organized at Civil Engineering Department of Dr. B.C. Roy Engineering College, Durgapur. The FDP was on the topic "Advancement in Civil Engineering" jointly hosted by Prof. Md. Hamjala Alam and Prof. (Dr.) Shovan Roy. Prof. (Dr.) Atul Krishna Banik and Prof. (Dr.) Supriya Pal from N.I.T. Durgapur graced the occasion as speakers and shared their valuable experience among the faculty members along with other eminent speakers from various institutions.

NHAI Site Visit

On 18th March 2023, students from 3rd year were given the opportunity to experience the construction techniques prevailing in highway/road as well as their maintenance. The particular site is in Panagarh and the construction is undertaken by National Authority of India.

The department of Civil Engineering of BCREC is committed to produce good civil engineers with a lot of field experience as experiences count a lot in placement. BCREC has MOU with NHAI for paid internships of its civil engineering students. This year twenty students from Civil Engineering 3rd year have attended the NHAI construction work in the Panagarh - Palsit stretch with a remuneration of Rs. 8000.00 each.

Six students from the Department of Civil Engineering, BCREC got the wonderful opportunity for an Internship under Shapoorji Palonji and Company Pvt. Ltd., Engineering Procurement & Construction Division, Pune.


Azadi Ka Amrit Mahotsav
Save water
G20
Highest Dam of India
SUPERLATIVES OF INDIA
TEHRI DAM,
Uttarakhand (260.5 m)
It is on the Bhagirathi River

On the 30th May 2023, the program "Purashkarayan", the annual award ceremony for the students of BCREC was organized. Goutam Kumar received the prestigious award of "Best Student from the Department of Civil Engineering" of 2023 batch.

INSPIRATIONAL ALUMNI

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

Abhishek Pandit

M.S. Civil Engineering,
Columbia University

B. Tech. Civil Engineering

BCREC, Batch: 2017-2021

Mr. Abhishek Pandit is currently working as a Resident Engineer for one of the top 10 Engineering companies in the world; Arcadis. His direct client are New York City; Department of Parks and Recreation. He graduated from Columbia University (An Ivy League institution) with a Master's degree In Civil Engineering (Construction Management) and from Dr B.C Roy Engineering college with a Bachelors degree in Civil Engineering.

He served as a student researcher at the Global Leaders in Construction Management (GLCM), a research group in the department of Civil Engineering at Columbia University. His research focused on cost-benefit, market analysis, and 3D construction printing materials. He worked as a Course Assistant for the course | Construction Management Specialization | offered by Columbia University CVN on the Coursera track throughtout his educational journey at Columbia. He has over 2 years of work experience as a Construction Project Engineer working both in India and the top 2 states of the US; Los Angeles & New York!

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EVERY MINUTE
IS A CHANCE
TO CHANGE THE
WORLD

ARTICLES

What is Civil Engineering?

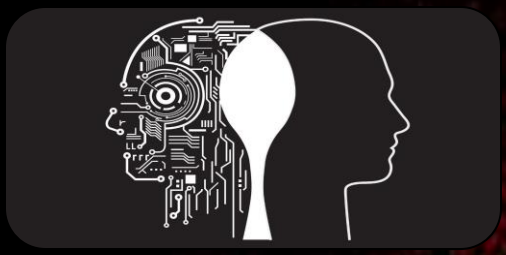
INTRODUCTION:- Civil engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including public works such as roads, bridges, canals, dams, airports, sewage systems, pipelines, structural components of buildings, and railways.

Civil engineering is traditionally broken into a number of sub-disciplines. It is considered the **second-oldest engineering discipline after military engineering**, and it is defined to distinguish non-military engineering from military engineering. Civil engineering can take place in the public sector from municipal public works departments through to federal government agencies, and in the private sector from locally based firms to global Fortune 500 companies.

Civil Engineer responsibilities include: Managing, designing, developing, creating and maintaining construction projects. Conducting on-site investigations and analyzing data. Assessing potential risks, materials and costs.

Shubhasis Paul
4th Year
Department of Civil Engineering

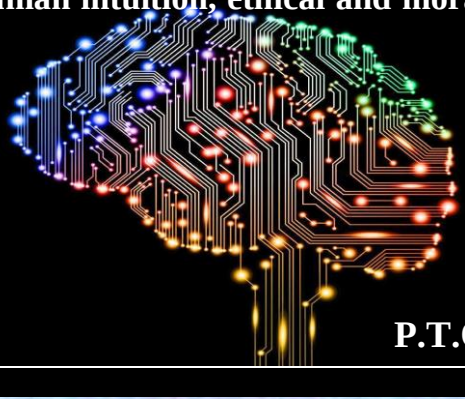
Can AI replace Civil Engineers?



Artificial intelligence (AI) is an aggregative term for describing when a machine mimics human cognitive functions, like problem-solving, pattern recognition, and learning. AI has the potential to assist civil engineers in their work, but it is unlikely to completely replace them in the near future. Civil engineers plan, build, and take care of the infrastructure that is important to modern society. This includes roads, bridges, buildings, water systems, and more. These projects require a deep understanding of engineering principles and knowledge of environmental, economic, and social factors. Civil engineers are also responsible for public safety, and AI systems may not always be able to make ethical decisions or understand the implications of their actions. AI cannot make critical decisions, think creatively, or understand the nuances of a specific project or situation. However, civil engineers must adapt to changing circumstances, work collaboratively with other professionals, and communicate complex information to stakeholders. Civil engineering is a complex and multidisciplinary field that requires the expertise and judgment of human professionals to design and manage infrastructure that meets the needs of society. Civil engineering involves a wide range of complex and nuanced tasks, from developing infrastructure to managing construction projects, identifying potential risks through modeling and simulation, and designing and optimizing structures. AI can be used to analyse large amounts of data and make predictions, which can be useful for tasks such as analyzing soil samples, predicting structural failure, and identifying potential issues in a design. AI can also help with tasks such as surveying and mapping, which can be time-consuming and labour-intensive.

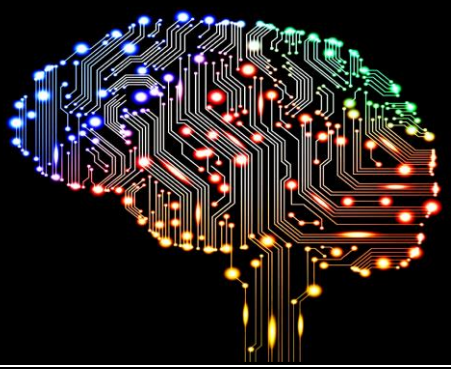
The typical AI-based evolutionary models used in construction include genetic algorithms, artificial immune systems, artificial neural networks, and genetic programming. Artificial neural networks exhibit excellent performance in lots of areas, including construction. AI can boost career opportunities in the construction sector by attracting more and more projects due to its capability for fast delivery models and improved efficiency. On the other hand, it would require proper training to be given to young civil engineers. Also, they need to be taught and trained by including relevant courses in their academic curriculum.

While AI can offer many benefits to the civil engineering sector, there are also potential disadvantages, such as dependence on technology, bias, a lack of human intuition, ethical and moral concerns, and job displacement.



P.T.O

- Site visits: A human civil engineer's ability to assess the site conditions, identify potential problems and opportunities, and communicate with other stakeholders.
- Dependence on technology: Civil engineers may become overly reliant on AI technology, which could decrease critical thinking and problem-solving skills.
- Bias: AI algorithms are only as good as the data they are trained on. If the data used to train the AI system is biased, the output of the system could also be biased.
- Lack of human intuition: While AI can process vast amounts of data, it cannot replicate human intuition and creativity. Civil engineers often rely on their intuition and experience to make important decisions that are not based solely on data.
- Ethics and morality: AI algorithms may not always make ethical or moral decisions. In the case of civil engineering, this could lead to designs that prioritize cost savings over safety or environmental impact.
- Job displacement: As AI technology advances, there is a potential for job displacement as certain tasks are automated. This could decrease the demand for human civil engineers, particularly in repetitive or routine tasks.



Arijit Kumar Banerji
Assistant Professor
Department of Civil Engineering

TRANSPORTATION ENGINEERING

INTRODUCTION :-Transportation engineering or transport engineering is the application of technology and scientific principles to the planning, functional design, operation and management of facilities for any mode of transportation in order to provide for the safe, efficient, rapid, comfortable, convenient, economical, and environmentally compatible movement of people and goods transport.

HIGHWAY DEVELOPMENT AND PLANNING:-

The road development in the country should be considered as a national interest as this has become beyond the capacity of provincial Govt. & local bodies.

An extra tax should be levied on petrol from the road users to develop a road development fund called "Central Road Fund"

A semi-official technical body should be formed to pool technical know-how from various parts of the country & to act as an advisory body on various aspects of roads.

TRAFFIC ENGINEERING:- **Traffic Engineering is the sub discipline of transportation engineering that addresses the planning, design and operation of streets and highways, their networks, adjacent land uses and interaction with other modes of transportation and their terminals.**

Infrastructure engineering:- **Infrastructure engineering focuses on designing, building, deploying and maintaining IT infrastructure. Infrastructure engineering is a specialized domain in the engineering department which is closely related to Civil engineering. B.Tech Infrastructure engineering, commonly known as Civil Infrastructure engineering, is an essential course in the structural and civil engineering fields. The course focuses on planning and constructing robust and contemporary structures such as buildings and highways to ensure overall civil infrastructure development.**

Aihik Mahinder
3rd Year
Department of Civil Engineering

Water Management System of Netherlands

History:

About 2000 years ago most of the Netherlands was covered by extensive peat swamps. The coast consisted of a row of coastal dunes and natural embankments which kept the swamps from draining and also from washing by sea. The areas that were suitable for habitation were on the high grounds in the south and east and on the dunes and natural embankment. The first permanent inhabitants were attracted by the clayey soil deposited by the sea which was much more fertile than the soil inland. To protect themselves from flood they built their homes on artificial dwelling hills known as terpen.

After about 1000AD the population grew due to which demand of land area increased. There was greater availability of workforce and dike construction was taken more seriously. By 1250AD most dikes had been connected to make a continuous sea defense. The next step was to move the dikes ever more seawards. With every cycle of tides a small layer of sediment, over years these layers had built to such a height that they were rarely flooded. Then it was considered safe to build a new dike around this area, but old dike was often kept as second line of defense. The construction method of dikes has changed over centuries from stacking of sea weed to wood planks to finally stone masonry.

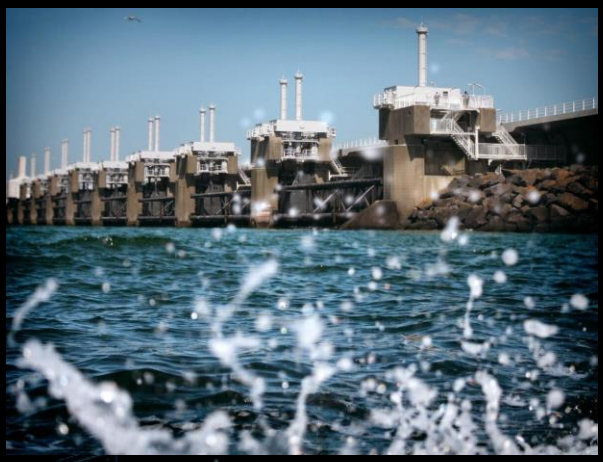
Challenges to set up Netherlands

One of the major problems in establishing Netherlands is that its maximum land area we see today is 1m below the sea level. It means that without humans' interference it would have been impossible to live in Netherlands.

The time when dikes were being constructed to save land area from getting flooded the first swamps were made agricultural land by colonist. Wheat was cultivated by digging a system of parallel drainage ditches water was drained. But peat settled much more than other soil and land subsidence resulted in lands becoming wet, Because of this it become difficult to remove excess water.

Three major European rivers the Rhine, Meuse and Scheldt flow through Netherlands. Large scale deforestation in the upstream for settlement led to river level rise and land being protected by dikes, giving less space to the river stream lead to river floods.

How Netherlands overcome these challenges



Land areas were being saved from washing away by sea by means of construction of dikes. A system of primary and secondary dikes was created to provide more safety. The development in materials constructing dikes has ensured more safety now than before. The mouths of streams and rivers were dammed to prevent high water levels flowing back stream .These systems kept the peat swamps dry for human settlement. Present day Netherlands uses modern sluice gate barriers along with stone masonry dikes for flood control.

Integrated flood management system of Netherlands

The Delta program is the Netherlands approach to flood risk management. An elaborate system of dams sluices gates, storm surge barriers, dikes and other protective measures.

As a part of Delta program 'wide green dike 'was introduced the grass covered clay dike is sufficient to protect dike against erosion.

Futuristic Netherlands

A massive storm surge barrier called Maeslantkering was completed in 1977 to protect Rotterdam Europe's largest port .It's equal in size to two Eiffel towers.

Shouvik Mondal
3rd Year
Department of Civil Engineering

Bamboo as a Reinforcement Member

The design, mix ratios, and construction methods utilised for steel reinforced concrete also apply to bamboo reinforced concrete. Bamboo reinforcement just replaces the steel reinforcement. Bamboo is a natural material that has been utilised for a variety of things. Primarily as a material for strength bearing. They are only available for medium-sized projects. Although bamboo has been around for generations, using it as a reinforcement material is a new development in the world of civil engineering building. This invention was based on research done at Clemson University's Agricultural College. Bamboo is naturally renewable and biodegradable.

SELECTION OF BAMBOO FOR REINFORCED CONCRETE CONSTRUCTION:

These criteria can be used to guide the choice of bamboo for reinforcing.

- Color and Age - Employ bamboo having an evident brown color. This shows the age of bamboo to be at least 3 years.
- Diameter - Use the one with long large culms
- Harvesting - Try to avoid those bamboos that are cut either during spring or summer seasons.
- Species - Among 1500 species of bamboo, the best one must checked, tested

DURABILITY OF BAMBOO MATERIAL:

Being a natural product makes it more vulnerable to environmental contaminants and insects. Curing bamboo is a preventative measure against this. Insect attraction is mostly caused by the starch in the humidity content, which can be treated during the curing process. The correct bamboo must be selected in order for the cure to be effective. It was mentioned in the bamboo choice. The curing of bamboo can be done either by:

- Curing on spot
- Immersion process
- By heating
- Smoke Curing

It is essential to apply the treatment while the bamboo is dry to ensure proper penetration. The durability-enhancing preservation treatment applied to bamboo shouldn't affect its chemical makeup.

The actual treatment ought to be durable and not wash away in high water, if any. Bamboo material durability is a big concern. Bamboo has high levels of physical and chemical characteristics and low humidity content. This low amount would prevent bamboo mould growth.
If bamboo reinforcement has had the appropriate treatments, it is shown to be more durable than steel.

PRESERVATION OF BAMBOO:

Bamboo must be thoroughly treated before use in order to prevent rot and insects from eating it. For this aim, borax and boric acid are frequently combined. Boiling sliced bamboo is another method that is frequently used to get rid of the starches that attract insects.

ADVANTAGES OF BAMBOO AS A REINFORCEMENT MEMBER:

- Because its strands run axially, bamboo has more tensile strength than steel.
- Bamboo has a very strong fire resistance capacity and can endure temperatures of up to 4000 C. This is caused by the presence of water and silicate acid at high concentrations.
- Due to its elastic qualities, bamboo is widely favoured in earthquake-prone areas.
- Due to their light weight, bamboos are readily moved or erected, making transportation and installation much simpler.
- They are affordable and simple to use.
- They are particularly in high demand in locations that are prone to earthquakes.

DISADVANTAGE OF BAMBOO AS A REINFORCEMENT MEMBER:

- Before being used for construction, bamboo should be properly treated against insect or fungus assault.
- Despite the use of numerous jointing procedures, bamboo's structural stability remains in doubt.
- Bamboo shrinks substantially more, especially as it loses water.

CONCLUSION:

Bamboo reinforced concrete can be built using the same techniques as steel reinforced concrete. Simply put, bamboo reinforcement is used in place of steel. Other construction procedures for bamboo-reinforced concrete are identical to those for conventional concrete. The bamboo-reinforced beam was found to be gradually failing; bamboo sticks can act as reinforcement because of their high tensile strength. This is a sensible plan for a cheap building. Compared to the steel reinforcing method, it is three times less expensive.

Rohit Prasad Mondal
Alumni, Batch (2019-23)
Department of Civil engineering

3D Printing Technology

The first 3D printer was invented in 1984 and over the last decades, 3D printing has become one of the fastest growing technologies. At the beginning it was very complicated and what is more, expensive technology. Over the years, 3D printing started to be present in everyday life and printers became commonly used in all kinds of industry fields. A lot of achievements have been made in medicine, automotive or aerospace industry. Thanks to the open source systems, prototyping of new product, and innovative applications of 3D printing in various fields are available for everyone. Improvement of the printing material and 3D technology became to be the goal for many companies all over the world from all industry sectors. In 2014, real revolution in construction industry has started, as the first house was printed starting a new chapter in building technology. Civil/Structural Engineering is one crucial sector that has touched and continues to impact many lives. It cuts across all phases of our daily living, from building construction to bridges, dams, roads, towers, storage centers, and other utilities in the city or community. It also has the task of maintaining and improving such facilities. Many consider it the oldest and most crucial branch of engineering, and one can only imagine the many possibilities of 3D printing and Civil Engineering. An important element is preparation of computer model for the parts to be manufactured. Fortunately, the level of 3D computer graphics both in terms of software and hardware makes it possible to build such digital models without much difficulty. It can be done using many commercial as well as Open Source software packages.

- ***3D Printing work-flow:*** The typical work-flow for 3D printing is illustrated in Figure 1. Firstly, a model is prepared in a 3D modeling application. Then it is exported to a file in a common 3D data exchange format. For 3D printing industry the most popular format is STL (Stereo lithography) discussed below. Next, for the majority of 3D printing technologies the saved data is processed to decompose the model into slices. This results in a set of 2D contour lines that are further processed to generate control commands to position printing head or laser beams.

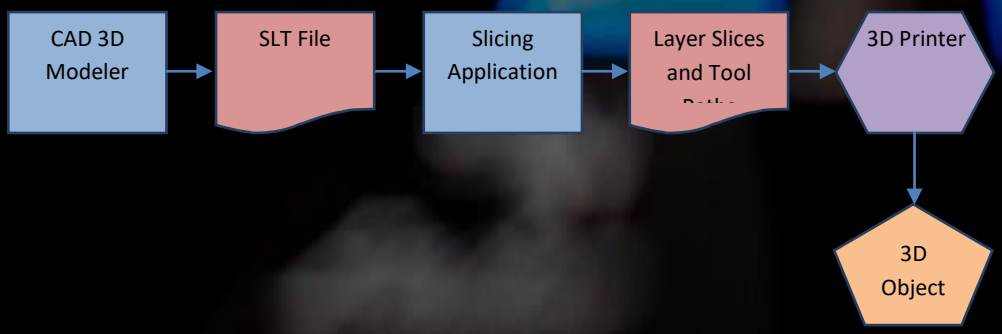


Figure Typical work-flow of 3D printing process.

➢ *STL data format*

Transferring model data via STL format requires constructing a triangulation of all boundary surfaces as illustrated in Figure 2. This is most easily done if the solid model is build using B-Rep (boundary) representation, as forthis representation the solid boundaries are stored explicitly within the model. The key element of exporting such representation to STL format is triangulation of curved surfaces. For CSG (Computed Solid Geometry) models, in order to save them in STL format, additional processing steps are needed to recover model boundaries.

➢ *Preparing 3D models*

In most cases in order to send digital model for printing it is enough to save it in STL format. Many 3D computer graphics programs can export models in STL. However, one should be careful using them, because many of these programs are designed to be used primarily for screen rendering of 3D models. It means that they can tolerate specific features of the models that are non-essential for rendering but that will be crucial for 3Dprinting. The main points to pay attention to are:

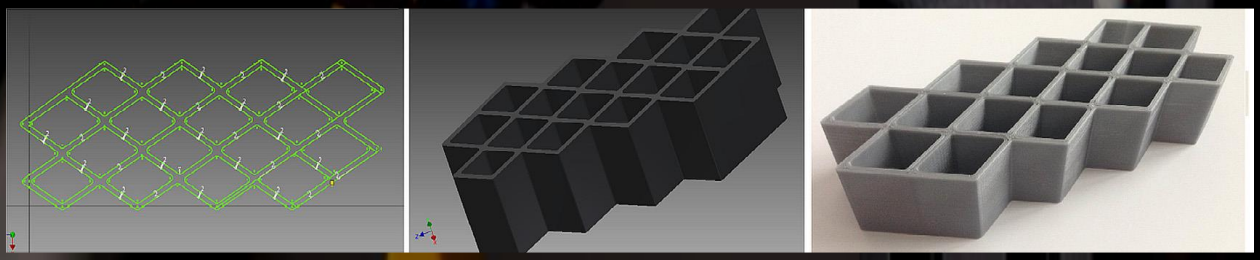
- 3D printing is a physical process contrary to screen rendering. Thus, one has to obey physical constraints. Designing a model for printing one has to ensure that all elements of the model are physically realizable. This means for instance that free 1D edges and 2D faces are not allowed in the model;
- Printing is done in the presence of gravity. One has to consider stability of the model and the weight of its parts to avoid damaging printed parts, for instance by breaking to slender support elements;
- Some printing technologies require to design holes through which excess of non-bounded material can be evacuated;
- The boundary surfaces of the model must be watertight, that means all faces must be connected and have consistent orientation of surface normal. This is in order to distinguish in unique way model interior and exterior space;
- The triangulated surfaces must form a 2D manifold. In particular, all edges must be shared by exactly two faces, and there should be no singular points, where the boundary of the model touches itself. Example of non-manifold model is illustrated in Figure3.

➢ *Software*

Autodesk Inventor is software that allows building complete 3D model of designed construction or device and enabling to create planar drawing documentation for the project. While using Inventor, most of the time that constructor needs to put in a project is sacrificed for creative and conception works. All the changes made in a model are automatically transferred to the drawings. Blender is open source package for 3D modeling, animations and computer games production. Interesting

feature of Blender is the export/import module for IFC models based on Ifc OpenShell library. This module allows import and further processing of models prepared in BIM applications such as Revit or Tekla 3D model of an envelope component developed by WinSun Company and Autodesk Inventor software environment.

Two 3D models of building envelope components have been designed in Autodesk Inventor software. Replicas of the wall from the Canal House and WinSun houses were prepared and printed using ABS material (AcrylonitrileButadiene Styrene) and using standard RepRap 3D printer.



(a) (b) (c)

Figure: (a) 2D sketch; (b) 3D model; (c) printed replica of a Canal House wall.

There are numerous advantages coming from developing 3D technology in construction and most important ones could be resumed as:

- Lower costs – the cost of printing construction elements of houses is much lower than traditional construction methods, also material transportation and storage on sites is limited;
- Environmentally friendly construction processes and the use of raw materials with low embodied energy (i.e. construction and industrial wastes);
- Reduced number of injuries and fatalities onsite as the printers will be able to do most hazardous and dangerous works;
- Wet construction processes are minimized, so that building erection process generate less material wastes and dust compared to traditional methods;
- Time savings – time required to complete the building can be considerably reduced.

Manas Saha
3rd Year
Department of Civil Engineering

Bitumen Emulsion

This Indian standard covers the physical and chemical requirements of cationic bitumen emulsion for application in road works. Bitumen emulsions are usually two-phase systems consisting of two immiscible liquids, bitumen and water.

There are two main types of bitumen emulsions:

1. Cationic
2. Anionic.

Difference between cationic emulsion & anionic emulsion:

The main difference between them is that the former, anionic emulsions are less sensitive to the presence of minerals or other materials in water; and actively interact with them.

Uses of bitumen emulsion:

Bitumen emulsions are by far the most commonly used binder in cold paving technologies, allowing numerous applications such as tack coats, microsurfacings and chip seals. Emulsion mostly refers to paint used for walls and ceilings.

Difference between emulsion and bitumen:

We can clearly see that emulsion easily wets the chip where the bitumen has only a very small amount of bitumen in contact with the aggregate. The bitumen will eventually gain a similar Contact area but emulsion requires warm temperatures and traffic to help with this.

The most important properties of bitumen emulsions are:

Stability, Viscosity, Breaking and Adhesively.

Laboratory test of bitumen emulsion:

1. The particle charge test
2. Reactivity test
3. Viscosity test

4. Adhesion test

Six parameters that can be used to change the breaking properties of emulsions :

1. Bitumen content
2. Aqueous phase composition
3. Particle size distribution
4. Environmental conditions
5. Chippings
6. The use of breaking agents

Pallabi Roy
Alumni, Batch (2019-23)
Department of Civil Engineering

IMBALANCE BETWEEN SOFTWARE AND CIVIL ENGINEERING

The field of civil engineering has seen a significant transformation in recent years, with technology playing an increasingly important role in the design, construction, and maintenance of the built environment. However, there is a growing concern among industry professionals that the rapid pace of technological change is creating an imbalance between software and civil engineering. In this article, we will explore this imbalance in detail and why it is important to bridge the gap between software and civil engineering.

➢ *The Role of Software in Civil Engineering*

Software has revolutionized the field of civil engineering in many ways. One of the most significant ways is in the development of building information modeling (BIM) software. BIM software allows engineers to create 3D models of buildings and infrastructure, enabling them to visualize the entire project and identify potential issues before construction begins. This technology has led to increased efficiency, reduced costs, and improved safety in the construction industry. Another area where software has had a significant impact is in the development of smart cities. Smart cities use data and technology to improve the quality of life for citizens, enhance the delivery of public services, and optimize the use of resources. For example, smart transportation systems use real-time data to optimize traffic flow, reduce congestion, and improve safety on the roads.

➢ *The Imbalance Between Software and Civil Engineering*

While software has brought many benefits to the field of civil engineering, there is a growing concern that the rapid pace of technological change is creating an imbalance between software and civil engineering. The problem is that software is often developed without a deep understanding of civil engineering principles. This can lead to software that does not accurately reflect the complex and often nonlinear behavior of building materials and structures, leading to potentially costly and dangerous errors. For example, BIM software may not accurately simulate the behavior of building materials under different conditions. This can lead to errors in the design of structures that may fail under real-world conditions. Similarly, smart city technologies may not be developed with a deep understanding of the social and cultural context of the cities in which they are being implemented. This can lead to solutions that may be technically impressive but fail to address the real needs of the communities they serve.

➢ *Bridging the Gap Between Software and Civil Engineering*

To bridge the gap between software and civil engineering, there is a growing recognition of the need for interdisciplinary collaboration between software developers and civil engineers. This collaboration can help ensure that software is developed with a deep understanding of the

principles and constraints of civil engineering and those civil engineers can take advantage of the full potential of software to improve their work.

Interdisciplinary collaboration can also lead to the development of new tools and methods that can improve the accuracy and efficiency of civil engineering projects. For example, the development of advanced simulation software that accurately models the behavior of building materials can help engineers design structures that are safer and more durable. Similarly, the integration of real-time data into smart city technologies can improve their effectiveness and ensure they are better aligned with the needs of communities.

➢ *Education and Training*

Another important aspect of bridging the gap between software and civil engineering is education and training. Civil engineers should be encouraged to develop a deeper understanding of the software they use, including its limitations and how it can be used to improve their work. Software developers should also be encouraged to learn more about the principles of civil engineering and the challenges faced by civil engineers in their work. This can be achieved through the development of interdisciplinary courses and training programs that bring together civil engineers and software developers. These programs can help promote greater understanding and collaboration between the two fields and encourage the development of new tools and methods that can improve the built environment.

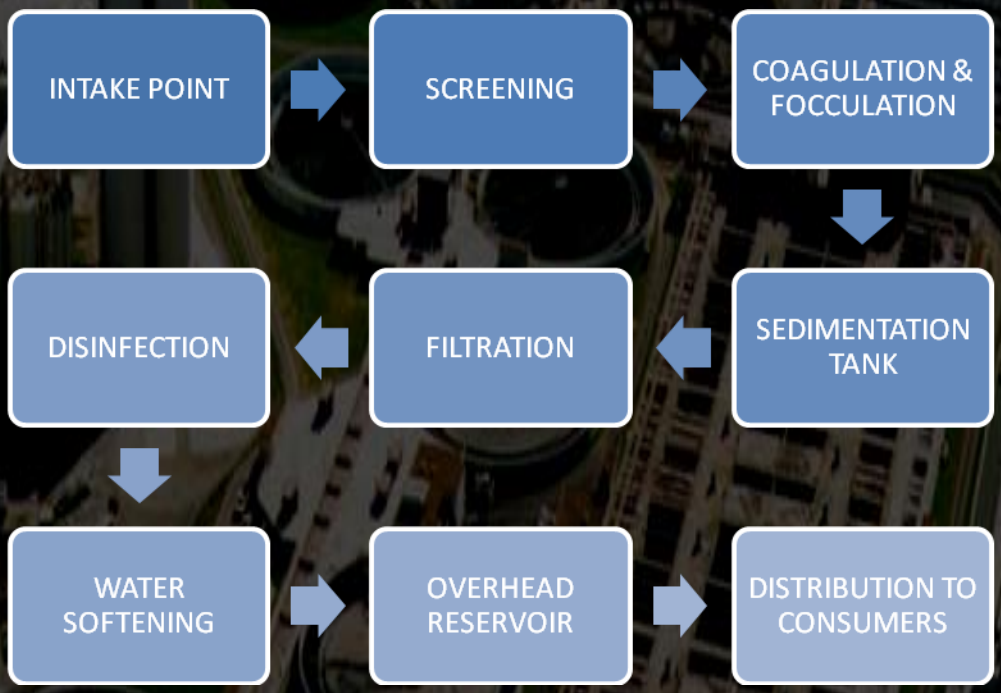
The imbalance between software and civil engineering is a growing concern for the industry. However, by fostering greater interdisciplinary collaboration and investing in education and training, we can bridge this gap and create a more effective and sustainable built environment for future generations.

Manas Saha
3rd Year
Department of Civil Engineering

WATER TREATMENT

Man cannot survive without water. But this water may be the cause of disaster if it is polluted by harmful agencies and used for drinking purpose. When the rainwater flows as run-off, it passes through the ground surface and gets collected in rivers, lakes and pond. On its way, the water get polluted by harmful salts,acids,minarals,pathogenic bacteria, radioactive substances etc.hence, the water may possess undesirable color, odor, taste and even disease causing microorganisms. This type of surface water is consuming by human beings for drinking, bathing, washing etc. as a result man suffers water borne diseases.

FLOW DIAGRAM OF WATER TREATMENT:

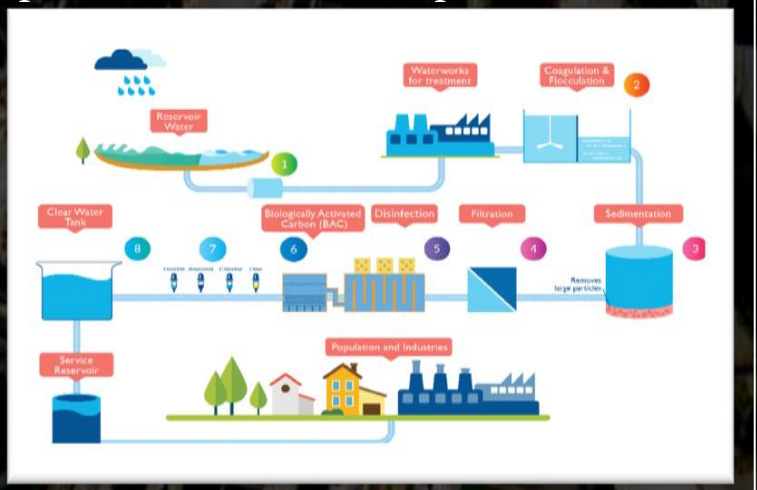


Intake point: **To** collects water in intake well so that the water can be supplied throughout the year.

Screening: **It** is the first process in water treatment. To remove all suspended solid and floating debris like wood pieces, cloth, paper pieces, decayed fruits and vegetables etc.Commonly two type of screen are used – Coarse screen(opening size 6mm to 50mm) and Fine screen (opening size 1.5mm to 5mm).

Coagulation &Flocculation: **To** removes the fine particles suspended in the water. A chemical called coagulant is added to the water, which neutralizes the fine particles negative electrical charge. Two coagulants commonly used in the treatment are aluminiumsulphate and ferric chloride. During flocculation, the water is gently stirred by paddles in a flocculation basin, and the flocks come into contact with each other to form larger forms.

Sedimentation: **To** removes heavier suspended material. The particles fall to the floor of settling tank, called sedimentation. The water is kept in the tank for several hours. The material accumulated at the bottom of the tank is called sludge, this is removed for disposal.



Filtration: **Solids** are separated from a liquid. In the water treatment, the solids that are not separated in the sedimentation tank are removing by passing water through sand and gravel beds. Filters are two types – slow sand filter & rapid sand filter.

Disinfection: **To** removes pathogenic bacteria. There are various methods of disinfection. It is necessary to protect the citizens from health hazard.

Water softening: **To** reduces harness from water, corrosive effect on pipes and improves the taste of food, life of fabrics. Ions exchange is a common industrial method of water softening.

Overhead reservoir: **The** function of this unit is to store the purified water after treatment is complete. The water from the reservoir is supplied to the consumers by gravity system.

Distribution: **The** purified water can be supplied evenly to the consumers and it can reach at every corner of various zones. The methods of distribution such as gravity system, pumping system, dual system.

Neha Bhattacharjee
3rd Year
Department of Civil Engineering

ever seen

lessly about
houlder.

POETRY

hem; he that cometh
Akbar) have a most

Oh, rapturous rose-crowned occasion,
When I such a glory might see!
But a cow of a purple persuasion
I never would be.

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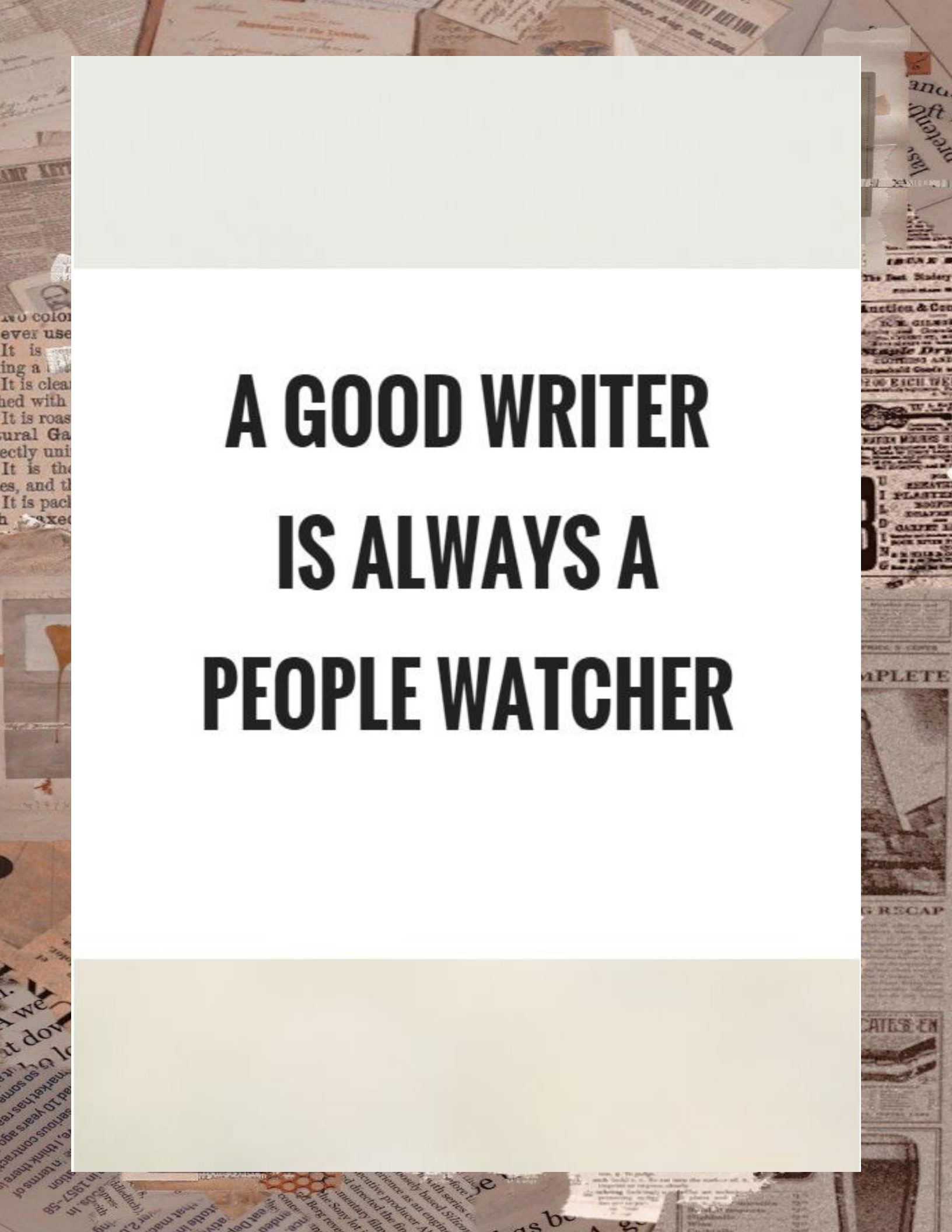
A GOOD WRITER
IS ALWAYS A
PEOPLE WATCHER

সভ্যতা

অনিন্দিতা রায় সেনগুপ্ত

সভ্যতার ধ্বজা উড়িয়ে ছুটছে সভ্যতার রথ,
উন্মত্ত বেপরোয়া সভ্য মানুষগুলো
ছুটে এসেছে অনেকখানি পথ।
আর সেই চাকায় পিষ্ট হচ্ছে প্রতিনিয়ত
আধুনিক সভ্যতা।
হারিয়ে যাচ্ছে প্রকৃত শ্রদ্ধা, সম্মান,ভালবাসা,
বিবেক, সততা।
আজ সভ্য মানুষ তাই আগ্রহী ক্ষুদ্র বসনে;
স্ট্যাটাস যাচাই হয় নাইট ক্লাব আর মদ্যপানে।
কাস্টিং কাউচে লুকিয়ে থাকে সেলিব্রিটির স্বপ্ন;
কালো হাতের ভিড়ে হাড়িয়ে যায় প্রকৃত রত্ন।
মেকী দেশপ্রেমের নামে বহুরূপীদের রাজনীতি,
অনলাইন আর খোলা মাঠের শিক্ষার মাতামাতি।
শৈশবের কুঁড়ি গুলো কেমন যেন নিস্তেজ -রুগ্ন,
স্মার্টফোনের স্মার্ট পড়ায় বড্ড তারা মগ্ন।
"" অনেক এগিয়েছি,,,যদি দুপা পিছিয়ে যাই- তুমি আমি
আর সভ্যতার চাকা- ক্ষতি কি?
যেখানে ছিল না-
মিডিয়ার রঙচঙে খবর বেচাকেনা,
ফেসবুক, হোয়াটস্অ্যাপের হাতছানি।
ছিল না-এত ব্যস্ততা ,রেশারেশি।
ছিল একসাথে বসে গল্প -আড্ডা -আলোচনা।
নিজের জন্য, সবার জন্য একটু সময় রাখা।
যদি এগুলো হয় কম সভ্যতার নিদর্শন---
তবু পিছিয়ে যেতে চাই আরো দু পা
তোমার হাতটি ধরে।
নতুন সুখে বাঁচবো নতুন করে।।

মা

হাজার যুদ্ধ বাইরে হলেও , শান্ত তখনও গর্ভ
সব সুগন্ধি হার মেনে যায় , আঁচল তোমার স্বর্গ
যাদুর খেলায় শ্রেষ্ঠ তুমি , হারছে যাদুকর
আদর শাসন মায়ার স্পর্শে তুমি , মানুষ গড়ার করিগর
তোমার সাথেই হাঁটতে শেখা , প্রথম হামাগুড়ি
তোমার কাছেই প্রথম লেখা , প্রথম হাতেখড়ি
কষ্ট হলেই আগলে নিয়ে , রেখেছো মাথায় হাত
তোমার কোলেই নিশ্চিন্তে কেটেছে , কত মন খারাপের রাত
তুমি আছো বলেই আমি , সঠিক পথে হাঁটি
জীবন বৃত্তের কেন্দ্র তুমি , আমার চাবিকাঠি

FARHAN ASHIQ
12001321009
3rd Year

7 Days

Monday saw me a wonderful hoping,

As I look rest six days joking.

Tuesday saw me smiling,

While sitting, eagerly waiting for weekend coming.

Wednesday saw me getting paid,

Money spent, bills underpaid.

Thursday convince me to doing great,

Time passed, nothing decorate.

Friday saw me a good vibes,

While napping, five days I just described.

Saturday make me more patience.

For pursue a passion, do something maintenance.

Sunday make me very rushing.

Because again Monday is coming.

- Susmita Bauri

4th Year

Department of Civil Engineering

An Engineer's valentine

-Kashinath Bhadra
4th year

Most probably,
When I was in class 12th
I was alone and
All was dark.
Beneath me and above
My life was full of confusion and wicked
But not the spark of love.
But now that are here with me
My heart is overjoyed
You have turned the straight line of my heart into sinusoidal
You load things from my memory
Onto my two-way lane
My life was once assembly code it's now like c++
My circuits, you can fix the voltage
Cross diode is much more
Than just point six or eight
With your op – amps and resistor
You have built my integrator.
You load the structural concept
That was shear force to bending moment
Then it was normal
Come to real picture,
You add structure with solved redundant reaction, the program was hanged
……..
Just recovery,
Earth pressure theory was come into the header file; you are my function generator,
I can't survive without you.
You have changed my world, increased my gain and
Made my math discrete,
So now,
I will end my poem here
With getch ().
Then press altx with double enter …

DRAWING

BE THE
TYPE OF
PERSON
YOU WANT TO
MEET

Ankita Kundu

3rd Year

Department of Civil Engineering

Anindya Chatterjee
3rd Year
Department of Civil Engineering

Sayan Pathak
3rd Year
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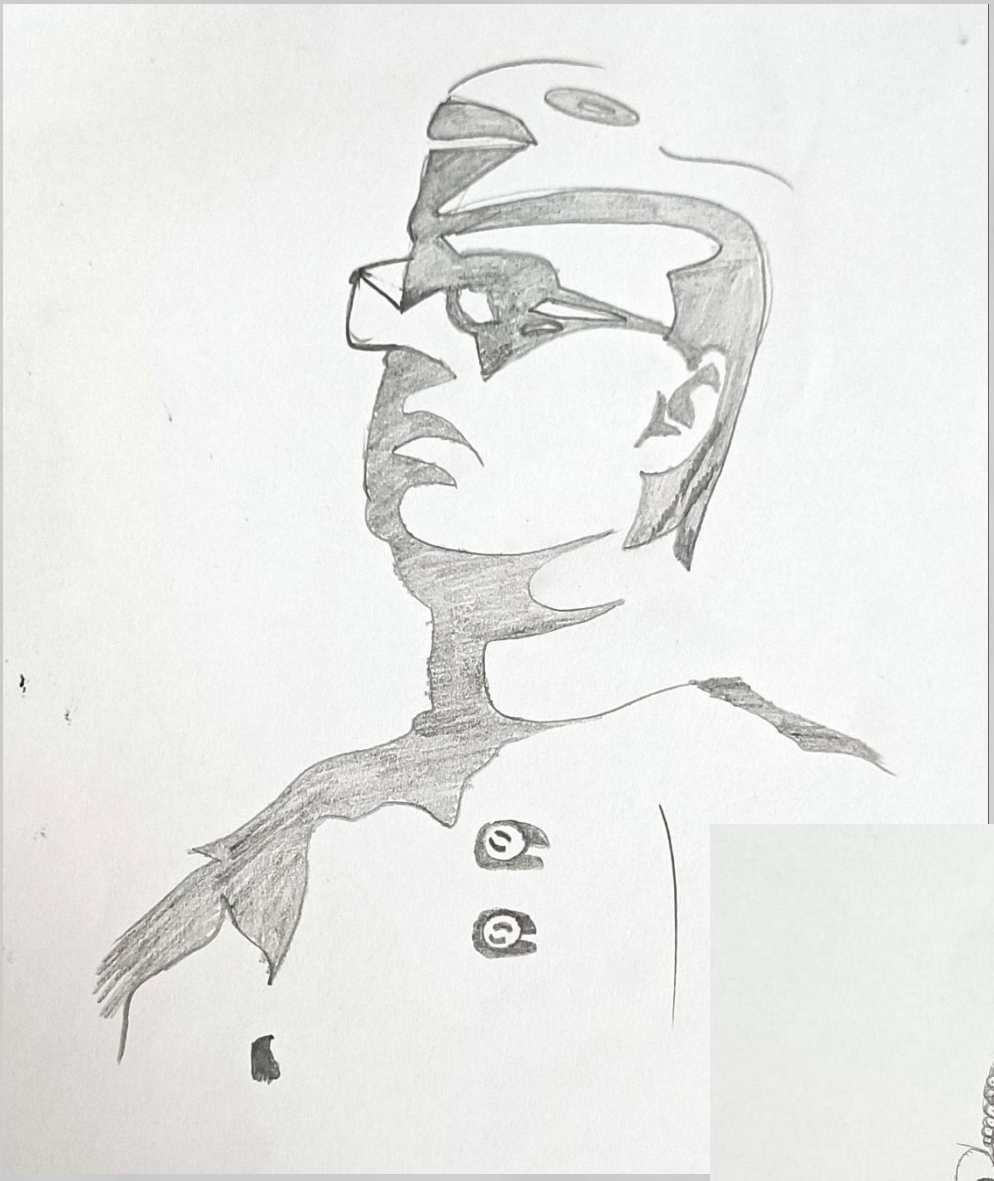
Manisha Dey
4th Year
Department of Civil Engineering

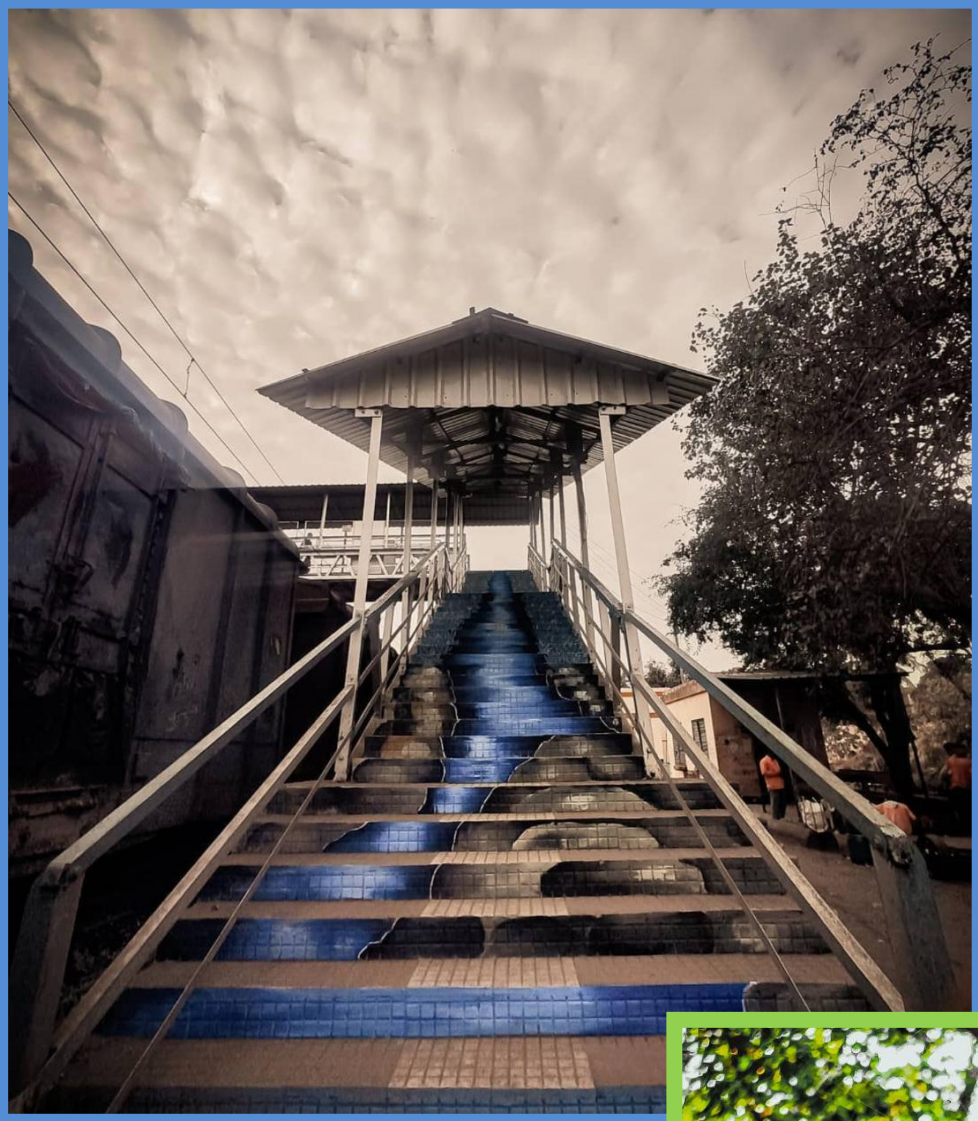


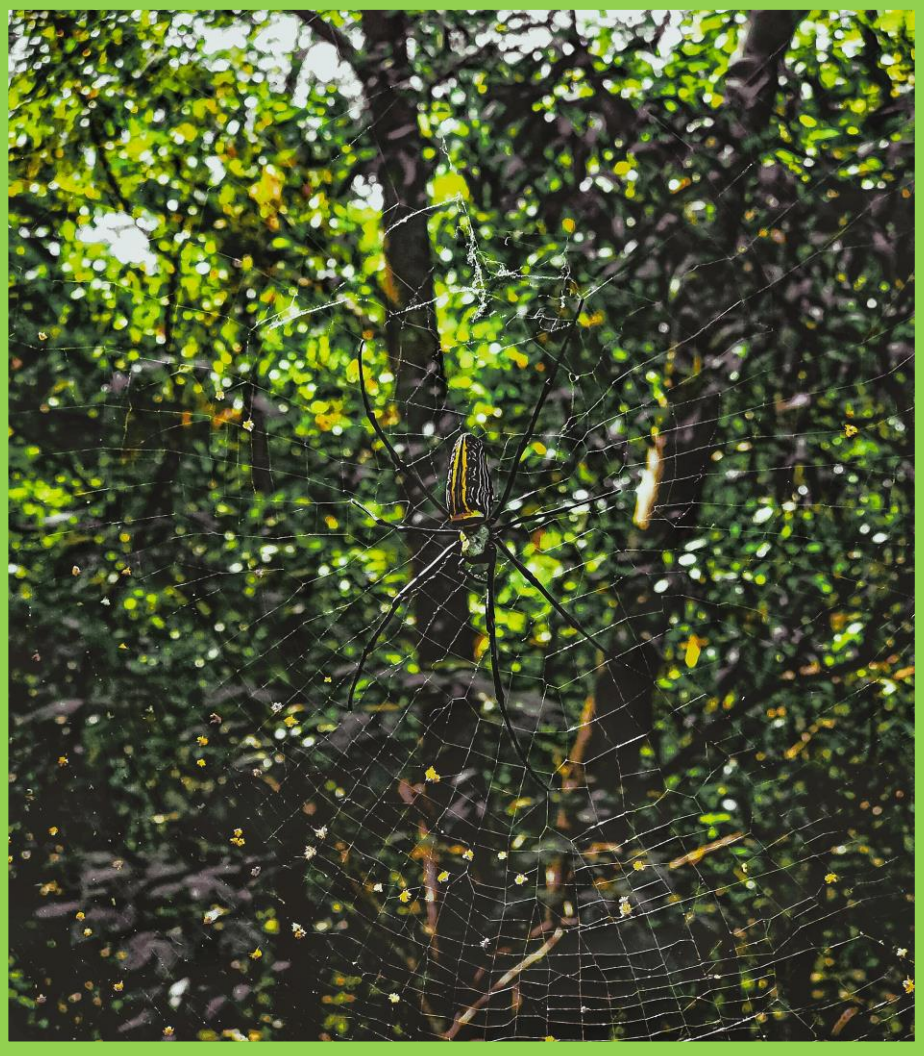
Jhilik Bandyopadhyay

4th Year

Department of Civil Engineering

photography





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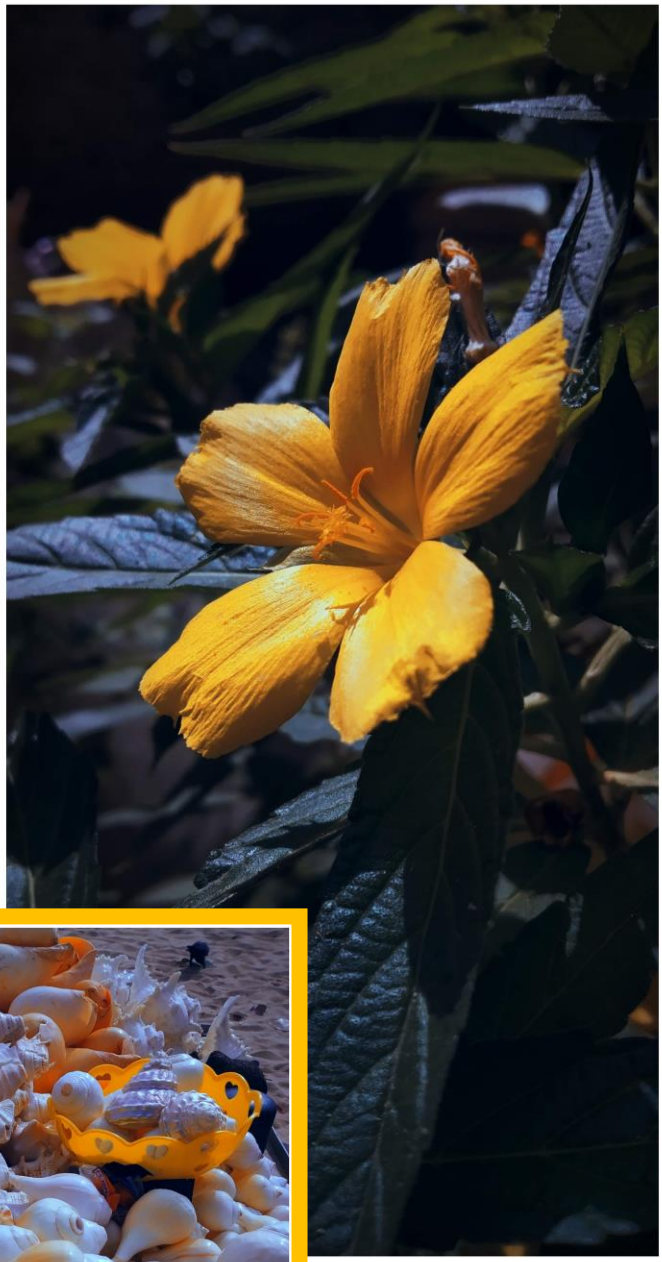

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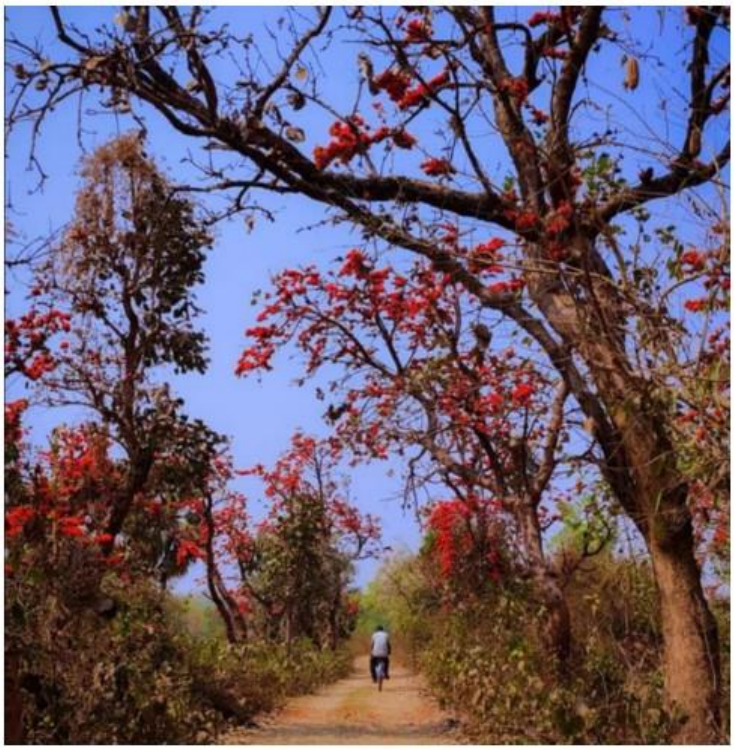

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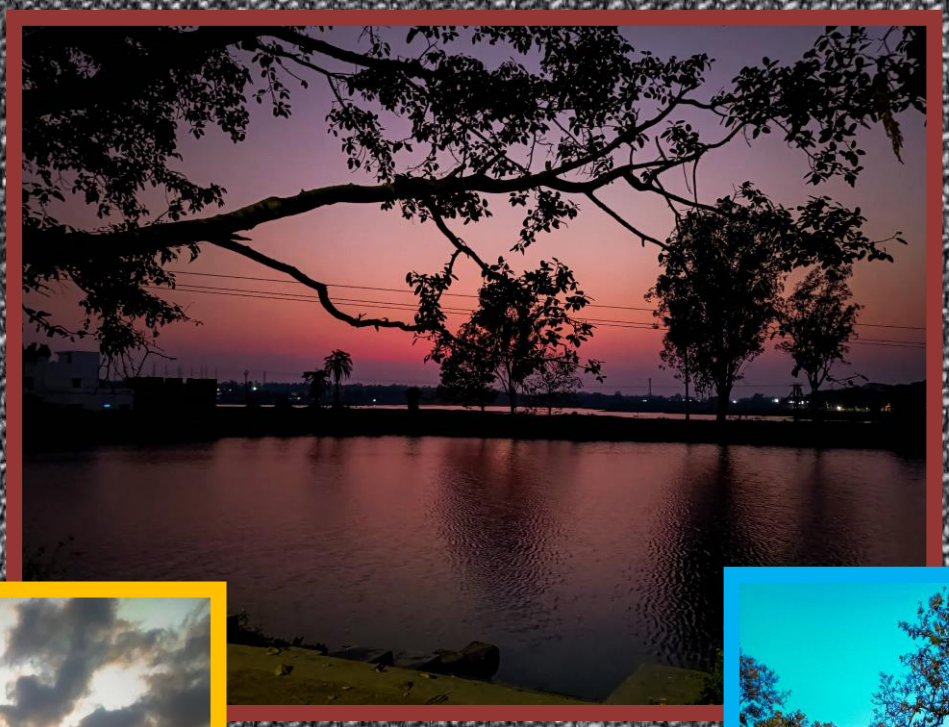

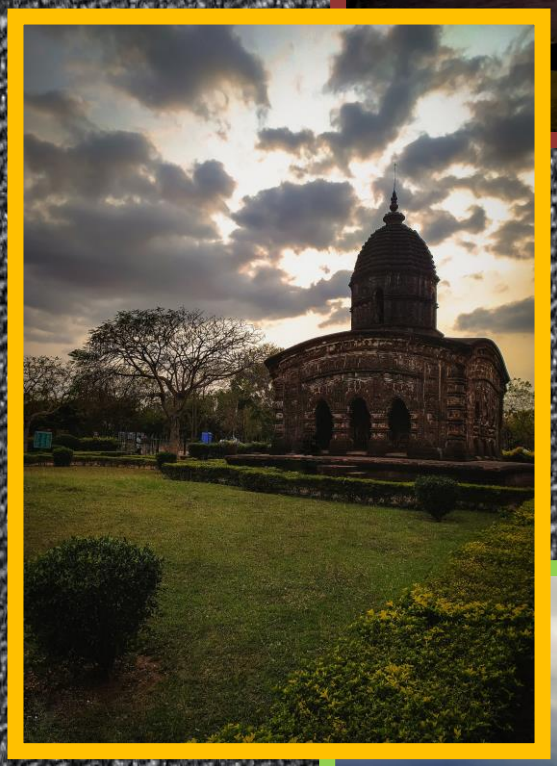

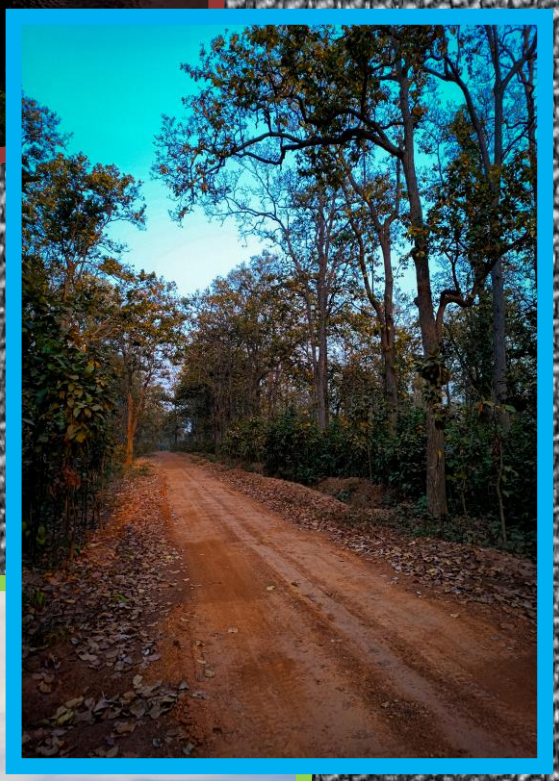

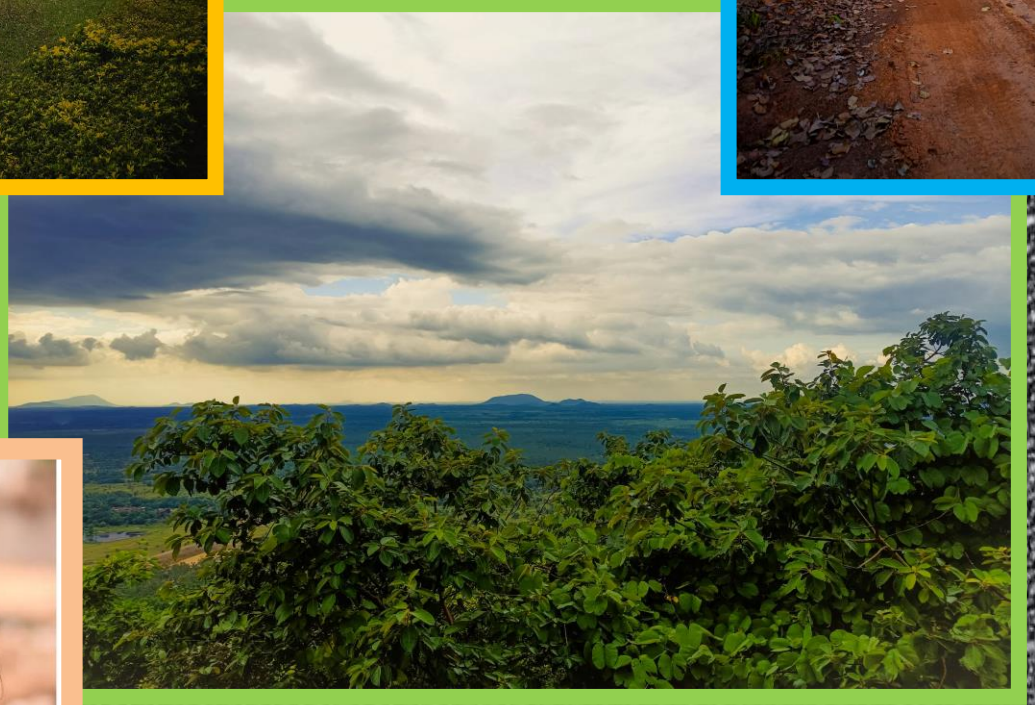

Sneha Karmakar

3rd Year

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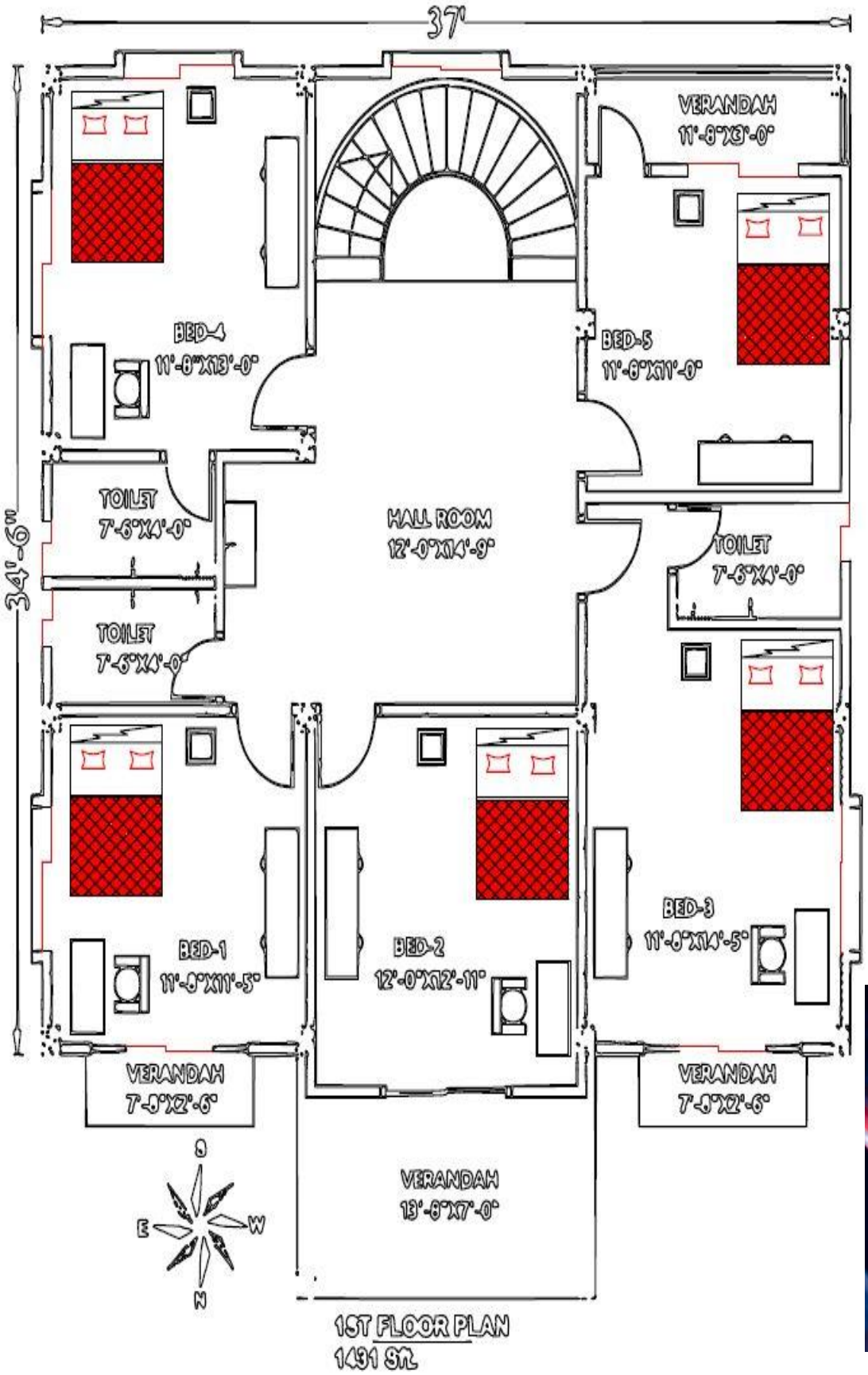

SUBIR GHOSH

4th Year, Civil Dept.

12001321069

E - Magazine

CIVILOHOLIC Vol-3

Technical Articles, Literatures, Poetry, Drawings and Photography are invited for upcoming publication.

Guidelines for submission to the magazine:

1. *Topic of Article*: Technical or Literature
2. *Language*: English, Hindi and Bengali
3. *Word limit*: 2000
4. Articles are to be sent as *Microsoft Word document*.
5. *For Photography and Drawings* send photos only in jpg/jpeg/png format.
6. Provide particulars: NAME, Roll no/Registration No., Year, Branch/ Department, and Contact Number.
7. Students of DR. B. C. Roy Engineering College can send their creations.
8. You can send suggestions if any at:

anupam.biswas@bcrec.ac.in

!!!THANK YOU!!!

MECHANICAL ENGINEERING
DEPARTMENT PRESENTS

MECH THINK

2K22-23
EDITION

VOl-3

mechthink.vl@gmail.com

#RME

rme_bcrec

ENLIGHTENMENT

om ajñāna-timirāndhasya jñānāñjana-śalākayā I
chakṣur unmīlitaṁ yena tasmai śrī-gurave namaḥ II

CONNOTATION:

I offer obeisance unto Śrī Guru, who has opened my eyes, which were blinded by the cataract of ignorance, with the collyrium of knowledge.

MESSAGE FROM THE DESK OF HEAD OF DEPARTMENT

Warm Greetings from the Department of Mechanical Engineering at Dr. B. C. Roy Engineering College, Durgapur.
We are pleased to put forward another annual issue of e-Magazine from Mechanical Engineering Department, Dr. B. C. Roy Engineering College before all. MECH-THINK covers key aspirations in the Department both within academics as well as beyond the academic fronts which kept the campus life abuzz with enthusiasm.

Excellence requires specific skills in various areas. The first step is a thirst for excellence which is motivation. This e-Magazine is an attempt towards achieving ‘motivation’. Our guiding philosophy at Mechanical Engineering Department, BCREC has been that ‘hands-on learning’ or ‘learning by doing’ trumps all other forms of learning.
It is fair to say that this philosophy has served us well in making all the students exposed to our methods take a quantum leap in better appreciating, understanding, learning and applying the engineering concepts. In the process our students have realized that learning can be easy, enriching and fun. We are sure that going forward, their exposure to our pedagogy will serve them well in all their academic and professional pursuits and careers. Recruiters always want to see in their employees, quality to show uniqueness in creativity and flexibility to blend in a team. Placement record of Mechanical Engineering Students in various organizations supports their quality of excellence.

DR.CHANDAN CHATTORAJ
PROFESSOR & HOD,
DEPARTMENT OF MECHANICAL ENGINEERING

"UDYAMENA HI SIDHYANTI KAARYAANI NA MANORATHAIH.
NAHI SUPTASYA SIMHASYA PRAVISHANTI MUKHE MRUGAAH ."

FOREWORD

I am happy to meet all of you through this 3rd Edition of MechThink and I thank all the students who have contributed for its successful publication.

I would like to share few words to you all. The young Engineers require a multi dimensional intelligence. The present world demands that the students should be able to create a modern Mindset within them. In this context I should mention that there is a huge industrial technological development in the core sectors. You will gather knowledge of Mechanical Engineering core subjects during your B.Tech course. Also you should gather knowledge of AI. In many situations you will find the application of Artificial Intelligence in the Modern Industry. The knowledge of Machine Learning and Data science will surely help you to match in the Modern Industry.
We hope that we will continue to deliver our best to serve the society and mankind.

Thank You all.

DR.KANCHAN CHATTERJEE
PROFESSOR
MECHANICAL ENGINEERING DEPARTMENT

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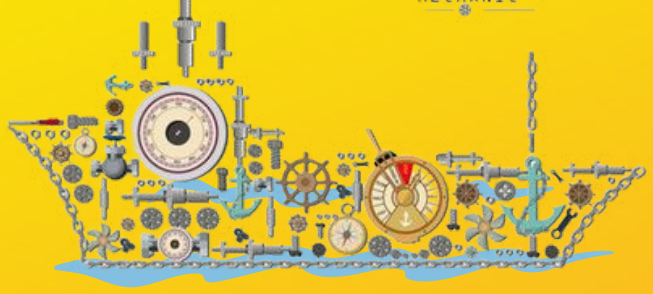

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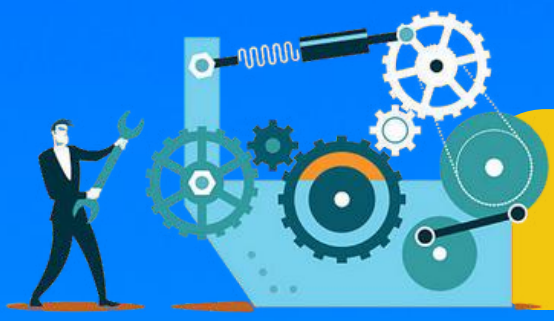
  2. LIFE



MECHANICAL ENGINEERING DEPARTMENT

VISION

To produce professionally competent engineers to cater to the needs of the industry, society and nation.

MISSION

To provide excellent opportunity for producing professionally competent engineers with the sense of social and moral responsibility by creating value added teaching and motivation for research.

WORKSHOPS

- Wood working
- Foundry
- Forging facilities
- Machine Shop
- Welding
- Forging
- Tin Smithy
- Fittings

LABORATORIES

- Engineering Graphics
- Fluid Mechanics Lab
- Thermal Engineering Lab
- Heat Transfer Lab
- Internal Combustion Lab
- Design Practice Lab
- Dynamics of Machine Lab
- Graphics Lab
- Measurements & Instrumentation Lab
- CAD-CAM Robotics Lab
- Manufacturing Technology Lab
- Mechatronics & Modern Lab
- Material Testing Lab
- Strength of Materials Lab

PROGRAM EDUCATIONAL OBJECTIVES

1. To provide conducive learning environment and quality technical education emphasizing the mathematics and science fundamentals related to mechanical engineering program to achieve professional excellence.
2. Graduates should prepare themselves for carrying out higher studies and quality technological research & development skills to keep pace with the current technological trends through out the career, either in industry or in entrepreneurship and ready to take leadership & capable of working as a member of multi discipline team.
3. To foster a sense of responsibility, professionalism, team work and ethical values by developing skills in, management and allied studies through well balanced courses which will help to develop a symbiotic relationship between the institution, society and the community.

PROGRAM SPECIFIC OUTCOMES(PSOs)

- Graduates will demonstrate the knowledge of applied mathematics and advanced software tools for design specification, development such as fabrication, analysis such as testing and operation of the physical systems, components and processes involved in mechanical engineering.
- Graduates will demonstrate the knowledge, skill and attitude to analyze the cause and effects on machine elements, processes and systems.

PROGRAM OUTCOMES

- Graduate will posses strong fundamental knowledge on applied mathematics, applied sciences and foundational Engineering concept for application in discipline.
- Graduate will develop confidence and will be able to design and conduct experiment on it as well as to analyze the problem and interpret data.
- Graduate will have the ability to design components, fluid & thermal systems, manufacturing processes and conduct testing experiment on it and interpret data for its development to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety,
- Graduate will posses fundamental knowledge and will have the ability to investigate complex problems with multidisciplinary team effort.
- Graduate will posses knowledge of using Modern tools eg. CAD/CAM and other Mechanical Engineering software like Inventor, Auto-CAD, CREO& ANSYS and have the ability to apply their knowledge from these for the solution of Mechanical Engineering problems.
- Graduate will be able to provide engineering solution, design solution which are society friendly and in this context graduates will also be able to analyze the local and global impact of Engineering on society.
- Graduate will be able to develop an environment friendly and cost effective new system and also have serious concern for the society.
- Graduate will learn the ability to understand the professional and ethical responsibility.
- Graduate will learn the ability to function individually and on multidisciplinary teams to solve complex Engineering problems by mutually sharing the knowledge with other team members.
- Graduate will be able to communicate effectively in both verbal and in the written form.
- Graduate will posses managerial skills and also have the knowledge of contemporary issues and will be able to perform in a project team. Graduate will gather the ability to calculate average cost of component, system and are capable of handling the project financially.
- Graduate will develop confidence for self and have the ability to engage in life long learning.

INDUSTRY SUPPORT : VOCATIONAL TRAINING

The Vocational Training Program is compulsory for all B.Tech students as per MAKAUT curriculum. The duration of VT is at least one & half months. It is to be completed during the periods between end of 3rd year, sixth semester and beginning of 4th year seventh semester.

- DURGAPUR STEEL PLANT
- DURGAPUR PROJECTS LTD.
- PHILIPS CARBON BLACK LTD.
- CENTRAL MECHANICAL ENGINEERING RESEARCH INSTITUTE
- ALLOY STEELS PLANT LTD
- DURGAPUR THERMAL POWER STATION
- NTPC SAIL POWER CO. LTD.
- TATA STEEL
- WIPRO INFOTECH
- STG INTERNATIONAL LTD.
- IBM, ACE
- VARIABLE ENERGY CYCLOTRON CENTRE
- CHITTARANJAN LOCOMOTIVE WORKS
- HINDUSTAN AERONAUTICS LIMITED
- WBPDCL
- NTPC NTPC, BARH
- TATA TECHNOLOGIES LTD.
- TATA CONSULTANCY SERVICES
- GOOGLE SUMMER PROJECT
- INFOSYS
- DISHERGARH POWER SUPPLY
- NALCO
- NTPC, CHATTISSGARH
- BSNL
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- IETE
- EASTERN RAILWAY
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- INDIAN OIL CORPORATION LTD.
- EASTERN COALFIELDS LTD.
- TATA CHEMICALS LTD.
- CETE
- JESSOP
- INSTRUMENTATION LIMITED
- SATLUJ JAL VIDYUT NIGAM
- TATA COMMUNICATIONS LTD.
- POWER GRID CORP.
- WELLMAN FAN INDUSTRIES
- NTPC, FARAKKA
- HINDUSTHAN PETRO CHEMICALS LTD.
- INDIAN AIRLINES
- SAHA INSTITUTE OF NUCLEAR PHYSICS
- CESC LTD.
- DVC, MAITHAN · BANDEL THERMAL POWER STATION WEST BENGAL STATE ELECTRICITY DISTRIBUTION CO. LTD.
- CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
- NML INDIA LTD.
- TATA MOTORS LTD.
- BAKRESWAR THERMAL POWER STATION
- URANIUM CORPORATION LTD.
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- HIND MOTORS LTD.
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- GARDEN REACH SHIP BUILDERS & ENGINEERS LTD.
- DELHI METRO
- AIRPORT AUTHORITY OF INDIA
- APEEJAY TEA LTD. / OIL INDIA DHULIAJANS
- TATA RYERSON
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- GLOBSYN TECHNOLOGIES LTD.
- MICROPRO
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- NORTH EASTERN ELECTRIC POWER CORP LTD.
- ISM
- TATA METALICS LTD. HINDUSTHAN COPPER LTD, ICC, MOUBHANDAR
- TRS SHED, EASTERN RAILWAY
- CMPDI
- BHARAT COKING COAL LTD.
- N.F. RAILWAYS
- PWD
- L&T LTD

ACHIEVEMENTS OF OUR DEPARTMENT

With a combined effort of our honorable teachers and hardworking students, every year students gets graduated from our department and secure a placement in various companies visiting to our college. Previous year too, many of our following students got their job and started a new phase of their career with flying colours.

2022 Placement List:
(Mechanical Engineering Department)

NAME	COMPANY NAME
SWAAGATO CHAKRABORTY	TCS
DEV MANGAL CHOUBEY	Wipro Limited
SAURAV BHARDWAJ	Wipro Limited
SOUVIK CHAKRABORTY	Wipro Limited
AARAV KUMAR	Wipro Limited (Velocity)
ASHISH KUMAR SINGH	Wipro Limited
SHUBHAM KUMAR	GrindMaster Machines Pvt. Ltd.
SUMAN BIR	Prestige Ice Creams Pvt. Ltd. (Rollick)
BISHAL KAR	Prestige Ice Creams Pvt. Ltd. (Rollick)
RISHABH TIWARI	Wipro Limited
SWAGATO CHAKRABORTY	Technip-FMC
ANUP KUMAR	Dhoot Transmission Pvt. Ltd
BIDHAN CHANDRA GHARA	Dhoot Transmission Pvt. Ltd
HANS PAL	Dhoot Transmission Pvt. Ltd
MD ASAD	Dhoot Transmission Pvt. Ltd
MD ZARDAR ALAM	Dhoot Transmission Pvt. Ltd
MRITYUNJOYMAHATO	Dhoot Transmission Pvt. Ltd
NEERAJ KUMAR	Dhoot Transmission Pvt. Ltd
PALASH PANJA	Dhoot Transmission Pvt. Ltd
PRABHAT KUMAR	Dhoot Transmission Pvt. Ltd
PRAFFUL BHARDWAJ	Dhoot Transmission Pvt. Ltd
RAJIB DAS	Dhoot Transmission Pvt. Ltd
RAMAN KUMAR HELA	Dhoot Transmission Pvt. Ltd
RAVI KUMAR	Dhoot Transmission Pvt. Ltd
SANTANUMAJI	Dhoot Transmission Pvt. Ltd
SAURAV KUMAR SIL	Dhoot Transmission Pvt. Ltd
SHUBHAM KUMAR	Dhoot Transmission Pvt. Ltd
SHUBHRODEEPSEN	Dhoot Transmission Pvt. Ltd
SOUMALYADUTTA	Dhoot Transmission Pvt. Ltd
SOUMIK RAJGURU	Dhoot Transmission Pvt. Ltd
SOURAV RAJ	Dhoot Transmission Pvt. Ltd
SUBHAMKONER	Dhoot Transmission Pvt. Ltd
SUBHASH KUMAR GUPTA	Dhoot Transmission Pvt. Ltd
SUBRATA MANNA	Dhoot Transmission Pvt. Ltd
SUMAN BIR	Dhoot Transmission Pvt. Ltd
SUMANJEETRAJAN	Dhoot Transmission Pvt. Ltd

SWAPNANIL DAS	Dhoot Transmission Pvt. Ltd.
SAYAN CHATTERJEE	Duflon Industries Pvt. Ltd
BISWAJIT MONDAL	Duflon Industries Pvt. Ltd
B. NAVEEN KUMAR	Duflon Industries Pvt. Ltd
AMIT CHOUHAN	Duflon Industries Pvt. Ltd
DIPAYAN MUKHERJEE	Duflon Industries Pvt. Ltd
PURAN CHANDRA MITRA	Duflon Industries Pvt. Ltd
SUBHAMOYKHATUA	Duflon Industries Pvt. Ltd
ROHAN DAN	Duflon Industries Pvt. Ltd
BIKASSAMANTA	Duflon Industries Pvt. Ltd.
SAYAN CHATTERJEE	Duflon Industries Pvt. Ltd
BISWAJIT MONDAL	Duflon Industries Pvt. Ltd
B. NAVEEN KUMAR	Duflon Industries Pvt. Ltd
AMIT CHOUHAN	Duflon Industries Pvt. Ltd
DIPAYAN MUKHERJEE	Duflon Industries Pvt. Ltd
PURAN CHANDRA MITRA	Duflon Industries Pvt. Ltd
SUBHAMOYKHATUA	Duflon Industries Pvt. Ltd
ROHAN DAN	Duflon Industries Pvt. Ltd
BIKASSAMANTA	Duflon Industries Pvt. Ltd.
DIPAYAN MUKHERJEE	BMW Industries Ltd
RAJ KUMAR GOPE	Merchant Navy
PINKI MONDAL	Merchant Navy
ABHISHEK KUMAR ANAND	Merchant Navy
SUMIT MONDAL	Minimac Systems Pvt. Ltd
ABHIJEET KR. PASWAN	Minimac Systems Pvt. Ltd.
MD. MUNAJIR HUSSAIN ANSARI	MEIL
DEV MANGAL CHOUBEY	MEIL
ANUPAM RAJ	MEIL
ANUBHAV ANAND	MEIL
SOUMEN ADHIKARI	MEIL
SPANDANSOM	MEIL
SOURAV SAINI	MEIL
PINKI MONDAL	IOTL
AMIT CHOUHAN	Minimac Systems Pvt. Ltd
SUBHADIP DAS	Minimac Systems Pvt. Ltd
TANVEER HASAN	Minimac Systems Pvt. Ltd.
ASHU SHARAN	Wipro Limited
PRAFFUL BHARDWAJ	Wipro Limited
SOUGATO KAR	Wipro Limited
ANUPAM RAJ	Wipro Limited
SHIV SHANKAR DE	IOTL
RAJIB DAS	Tega Industries Ltd.
BISHAL PAL	JiwanramSeoduttrai Group
ASHU SHARAN	Infosys
PRABHAT KUMAR	Infosys
PRAFFUL BHARDWAJ	Infosys
RAMAN KUMAR HELA	HITPL (Hiralal Industrial Technologies Pvt. Ltd.)
SAURAV BHARDWAJ	Capgemini

MECH THINK

2K22-23

TEACHERS DAY 2K22

TEACHER'S DAY 2K22

INAUGRATION OF THE EVENT ALONGWITH RESPECTING OUR CULTURE.

CAKE CUTTING CELEBRATION

SPEECH BY OUR HONOURABLE TEACHERS

THE CONCLUSION OF THE EVENT WITH SOME MELODIOUS SONGS

MECH THINK

2K22-23

VISHWAKARMA POOJA 2022

Happy

VISHWAKARMA Puja

HE IS THE DIVINE ARCHITECT, SCULPTOR, AND ENGINEER.
THE DAY TO PRAY TO THE CREATOR OF TOOLS AND MACHINES AND SEEK HIS BLESSINGS FOR A PROGRESSIVE AND PROSPEROUS LIFE... WARM WISHES ON VISHWAKARMA PUJA TO ALL.

"Sangachhadhwam Samvadadhwam Samvo-manaansi Jaanataam."

-May we march forward with a common goal. May we be open-minded and work together in harmony.

MECH THINK

2K22-23

PHOTOGRAPHY

PAPAI OJHA
2nd YEAR
ME DEPARTMENT

RAJNISH KUMAR RANJAN
3rd YEAR
ME DEPARTMENT

KRISHANU MANDAL
2nd YEAR
ME DEPARTMENT

BIRTH TO MATURITY CAPTURED IN THE CAMERA

1

2

BISHAL SINGH
2nd YEAR
ME DEPARTMENT

3

4

SOURAV DAS
2nd YEAR
ME DEPARTMENT

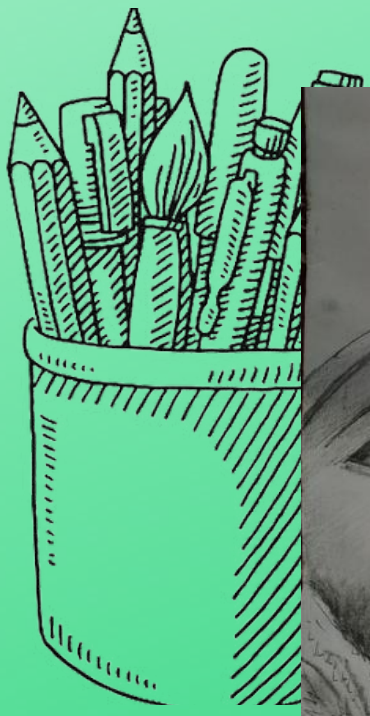
DIPANSHU RAJ
2nd YEAR
ME DEPARTMENT

MECH THINK

2K22-23

PAINTINGS

RAJNISH KUMAR RANJAN
3rd YEAR
ME DEPARTMENT



SOURAV DAS
2nd YEAR
ME DEPARTMENT

AYUSH KUMAR
3rd YEAR
ME DEPARTMENT

ANURAG PRASAD
3rd YEAR
ME DEPARTMENT

MECH THINK

2K22-23

POETRY

MECHANICAL ENGINEER-ING

Fabricat-ing,Cast-ing,Forg-ing,
Major part of Manufactur-ing.

Drill-ing,Mill-ing,Shap-ing,Bor-ing,
These are nothing but Machin-ing.

Weld-ing,Rivet-ing, Braz-ing,
These are types of Join-ing.

Carnot,Otto,Diesel,Brayton,Joule,
Provides you thermodynamics tool.

Source,Sink,Enthalpy,Entropy,
Convert Heat to Work Energy.

Gear,Shaft,Coupling,Bear-ing,
Study carefully while Design-ing.

DR,. KANCHAN CHATTERJEE
PROFESSOR
ME DEPARTMENT

GROWING OLDER

Struggling through the pain that somewhere worth of...
Somewhere each painful hustle valued,
When the cozy nights were used to be restless...

Expected for the best, Sacrifices the
Peace with the rest...
Dawn to dusk looking for the productive result..
which one comes by a meaningless test..

Days used to be spiky ,nights are Soaked.
Moving to the place with a curious hope..
Reached to the height, but downed to the Feet..
Body gets ease but soul turns to rest in peace...

Growing older with the tough with the rough..
With the needs with the deeds..
Yes!! Again the Sun I'll be shine with
Bright..
When things came out and all I'll be
Alright...

VICKY KUMAR MANDAL
3rd YEAR
ME DEPARTMENT

।। সমান্তরাল ।।

ইশারা, ইঙ্গিতে
চেনা হলেও,অচেনা ভঙ্গিতে
ভাসা অস্বাভাবিকতায়',
মন খারাপের দেশে--
সবকিছুই সমান্তরাল ।
খুব সাহসী আজ
ষড়যন্ত্রের মিথ্যা অপবাদ।
ভীতু নয় তবু ঘরকুনো আত্মসম্মান সত্যবাদ।
দিনের আলোয় লেখা শব্দেরা ,
রাতের আঁধারে পথহারা ।

স্মিতহাস্য মুখে আজ
উলঙ্গ রসিকতা,
দিগন্তে প্রান্তরে ভরা
সবুজ ঘাসের হাতছানি,
হয়তো ভোরের শিশিরকে, আর ভাবায় না।
চোখের কালো মেঘ অশ্রুপাত ঘটালেও,
সেরকম আর কাঁদায় না ।
আসলে--
মেঘে সুত্রপাত তো মনে।
আর তার অন্তরালে---
সবটুকুই যে সমান্তরাল ।।

KAMALA DAS
2nd YEAR
ME DEPARTMENT

শূন্য

শূন্য থেকেই জীবন শুরু,
শূন্যতাতেই শেষ
শূন্য থেকেই পাচ্ছি আমি ,
অন্তহীন-এর আবেশ।

শূণ্য হলেই ভাবি মোরা ,
এটাই সবার শেষ
কিন্তু শূন্য দিয়েই গড়েছি
আমার স্বপ্নের এভারেস্ট।

সেই স্বপ্নের হাতছানি পায়
রাতের অবকাশে
তাই রাতের আকাশ ঝলসে ওঠে
স্বপ্নের ক্যানভাসে।

সেই এভারেষ্ট ছুঁয়ে আমি
হারিয়ে যেতে চাই
কারণ হারিয়ে গিয়েই'
আমি মোর নতুন এভারেস্ট পাই।

DIYA MONDAL
2nd YEAR
ME DEPARTMENT

নীল দিগন্তে

তব সুস্থির, চিরগম্ভীর, বাঁধনে বাঁধা মন,
আমি তব মনে কোন সে গোপনে ছুটেছি চিরোক্ষণ।

তুমি চিরব্যাপী, টুকরো জোনাকি, আলোর পারাপার,
আমি নিঃশ্বাস, সন্ধে আকাশ, জ্বেলেছি তারা হাজার।

তবু কেনো হায়, ধরতে না পায়, মন লুকোনো সে কোন প্রান্তে,
মন কেনো হায়, তবু ছুটে যায়, কোন সে নীল দিগন্তে।

ARDHENDU SAHA
3rd YEAR
ME DEPARTMENT

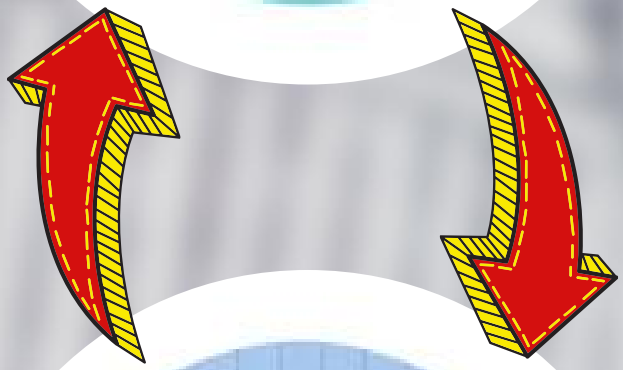
MECH THINK

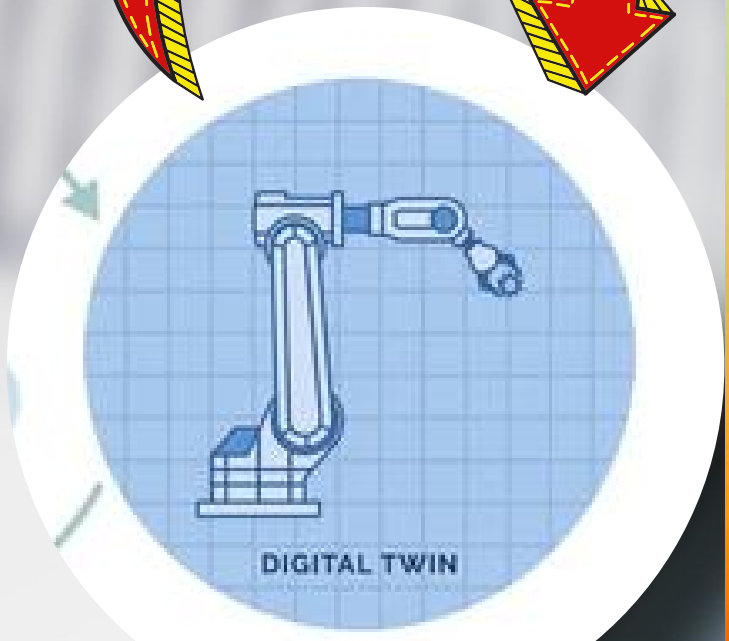
2K22-23

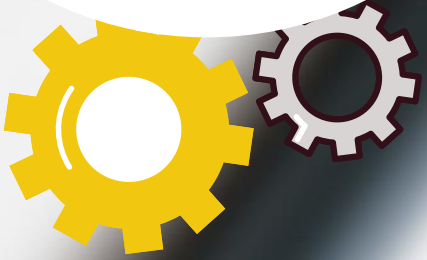
ARTICLE

MECH THINK

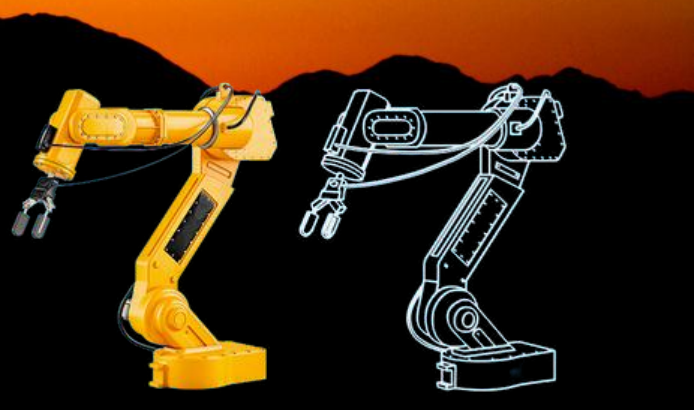
2K22-23







DIGITAL TWIN



DIGITAL TWIN

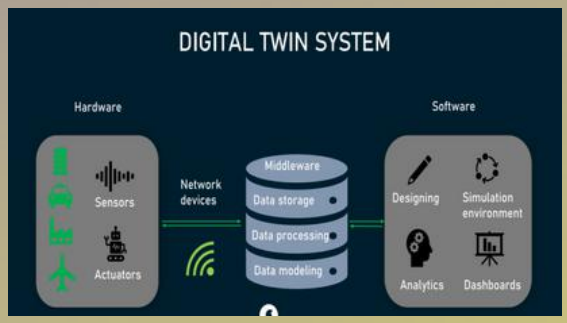
In the flourishing world of new technologies and machines , accuracy and precision plays very crucial role for every one who will going to get involved with it .It is not sufficient to check only the what if's? of any arriving technology .It's important to know how will it behave when interacting with the real world objects ?.

With advancement of technologies it is now possible through Digital Twin(DT) technology. In simple words It is the virtual replica of the physical object with all the real world information's .It may sound familiar with some existing technologies like simulation or 3D CAD modelling but there is some major difference that will discuss latter.
In 1960's mirroring technology was first used by NASA to replicate system in space .Later the term digital twin was coined by Dr Michael Grieves chief scantiest of advance manufacturing in 2002. DT comprises of the physical space the virtual space and flow of information .It is a righteous combination of existing technologies like 3D simulation , IOT(internet of things) , big data , artificial intelligence , cloud computing , edge computing , blockchain , etc.

The expertise develop a virtual model that simulates the original object. the virtual models created is such way that it can collect data from the real world through sensors. the digital model imitate and simulate the action of the original object in the real world and give an insight to the developer of the potential , performance and problems .It create a path to exchange real time information like temperature , power etc. Simulation and other technologies issue for design and offline optimization and how it will behave in certain cases .But DT works on the real time data life cycle . Simulation does not give us information about how the product will interact in real world but DT can give a look into the consequences when physical thing will interact.

This DT technology is majorly used in manufacturing ,automobiles healthcare service s, urban planning etc. for example in automobile sector it can detect energy loss and improved performances . In health care it is immensely growing the digital twins of the patient organs how will it react to specific environment in real life. The biggest example we can take is Tesla which has digital twin for every car get the maximum accuracy as possible.

The new uprising of industries 4.0 , India has come another one step forward , where some digital twin startups is developed in India for a better next generation development. Like Paninia company for next generation aerospace product , Switch on company for cutting edge technology to empower intelligence in manufacturing technology , and some more .



With all the benefits of reduce downtime, improved productivity, increase reliability its another a futuristic approach for a better future and sustainable approach from planning to manufacturing a product with fewer available resources .It provides a way to reduce energy consumptions and will help in achieve climate goals.

PAYEL NAYAK
3rd YEAR
ME DEPARTMENT

MECH THINK

2K22-23

GREEN ENERGY

POWERING A SAFER FUTURE

GREEN ENERGY

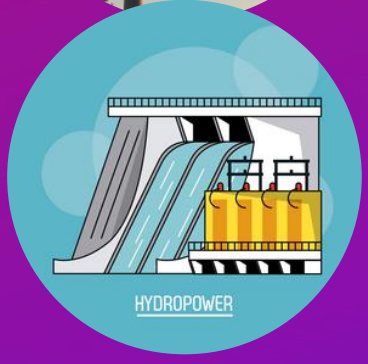
POWERING A SAFER FUTURE

Green Energy is any type of energy that we use and is generated from natural resources and mainly we get this from Renewable energy. There are some of the major Green Energy sources like Solar Energy, Geothermal Energy, Wind energy etc. There is still some of the confusion between Green Energy and Renewable Energy and this is need to be resolved to get a more advanced idea about Green Energy. Though there is a fine thin line between Green Energy and Renewable Energy but this line enough to create an impact on future. Green Energy means a resource that will not produce pollution or cannot damage or disturb the ecosystem much. But if we see forest wood or things similar to this, they are some kinds of Natural and Renewable sources of Energy but when we burnt them, they produce Carbon-dioxide surely due to burning so it cannot be green form of Energy. Green Energy sources also avoid excavation, mining process as because they disturb and damage the ecosystem.

Types of Green Energy- There are many sources of Green Energy, but the major and important sources are Wind Energy, Hydro Energy, Solar Energy.

Ø Wind Energy- This energy is mainly helpful and particularly suited to offshore and higher altitude sites; this energy uses the power of flow of air whenever available around the world to push the Turbines that then generate electricity.

Ø Hydro Energy- This type of Green Energy uses the flow of water in rivers, dams or wherever it is available to produce electricity. This can even be used on a small scale by using the flow of water through pipes in home or from rainfall etc.



Ø Solar Energy- This energy is produced by suing PV (photovoltaics) cells that capture sun's ray and transform it into electricity through solar panels. It consists of an arrangement of several components;

1. Solar Panels -Converts sun's ray to electricity.
2. Solar Inverter- Converts D.C to A.C.
3. Mounting, Cabling- Working system.

Solar Tracking- Improve the system overall efficiency.

Solar PV ranges from small, rooftop-mounted or building integrated system with capacities from few to several tens of KW to large utility scale power station of hundred megawatts. It can be used for domestic purposes etc.

Importance of Green Energy- Green Energy is important for the environment and for the future needs also, because day by day we are damaging the ecosystem directly or indirectly, Green Energy also provides a stable and a pocket friendly cost solution for the energy needs to many parts of the world, this cost will be falling continuously as we all will increase the use of it more. Green Energy has the capacity to replace fossil fuels in future. Green Energy provides real benefits for the environment since the power is coming from the natural resources such as sunlight, wind, water that means they are opposite to the unsustainable, carbon emitting fossil fuels that have powered us for a century or more. Green Energy is environment friendly and also day by day fossil fuels are moving towards the shortage as they are running out. As the fossil fuels are becoming more expensive due to lack of resources and at the same time Green Energy is becoming more pocket friendly then as a result if we can use the Green Energy at the right position, right area and at right condition and location then it will be more useful and efficient, like if we use Solar Energy at the strong sunlight area then it will create more electricity at a very minimal cost. Currently Wind farms are seen to be the most efficient source of Green Energy as it requires less processing than production so we have to use the Green Energies at the right places. Green Energy now a days used in industries, transportation, and it has great impact on environment, moving towards zero emission, lowering the greenhouse gases emission and it is also saving our health at the same time.

Conclusion- Green Energy can be more efficient in future and it has shown its efficiency in present also. Green Energy offering a cleaner alternative to many of today's energy sources. Rapidly replenished, these energy sources are not just good for the environment but are also leading to the job creation and look set to become economically viable as development is ongoing. By developing a variety of Green Energy solutions e can create a totally sustainable future for our energy provision, without damaging the world we all are living, so always Go green, breathe clean.

JEET DUTTA
3rd YEAR
ME DEPARTMENT

MECH THINK

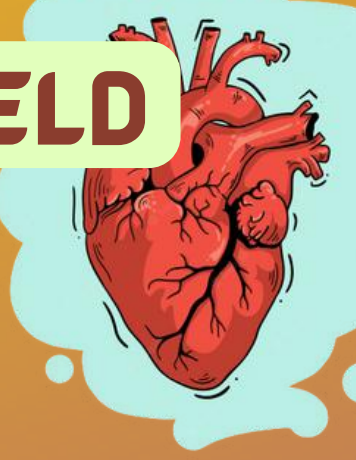
2K22-23

3-D PRINTING IN MEDICAL FIELD

A REVOLUTIONARY TOOL OR JUST A GIMMICK

3D PRINTING IN MEDICAL FIELD

A REVOLUTIONARY TOOL OR JUST A GIMMICK



3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file.The creation of a 3D printed object is achieved using additive processes. In an additive process an object is created by laying down successive layers of material until the object is created. Each of these layers can be seen as a thinly sliced cross-section of the object. This technology creates a three-dimensional object by reading a digital blueprint and reproducing successive layers using filament and ultraviolet light. One of its primary benefits is that it doesn't require the clumsy, expensive equipment necessary in traditional manufacturing, which speeds up the production of products. At many hospitals, surgeons use 3D renderings of a patient's anatomy to practice procedures before surgery, and 3D printers can be used to customise body parts such as knee implants.

3D printing in medicine and healthcare could revolutionise drug creation and the production of medical equipment. It could also offer new methods for practising medicine, optimising supply chains, and propose cheaper and way more personalized medical services. Some $20 billion in global spending is expected to be devoted to 3D printing by 2025, nearly three times as much as in 2017, according to estimates from GlobalData. In the medical sector, increased 3D spending is attributable to the needs of an ageing population.

A post on the American Hospital Association website reports that in 2019, 113 hospitals had centralised 3D facilities for point-of-care manufacturing, compared to only three in 2010. And according to Pew Trust, the 3D printing healthcare market increased dramatically during the COVID-19 pandemic when many hospitals depended on this technology for the rollout of personal protective equipment (PPE), and medical devices.

PERSONALISED MEDICAL EQUIPMENT:

It is a well-known fact that medical equipment is expensive. Thus, 3D printing splints, medical models used before surgeries or other necessary means for healing could save vast amounts of money. And there are already brilliant examples on the market of how to do it!

Ian McHale, a senior at the US Steinert High School, created a blueprint for producing finger splints. A low-end 3D printer can print his splint quickly and affordably, about 2¢ worth of ABS plastic in about ten minutes! For developing countries, where splints can often be ordered from overseas only in bulk, it could mean the cheapest solution for poor communities. At the same time, it could efficiently serve personal needs.

As for 3D printed plaster casts, for the moment, these remain a distant hope. In theory, it sounds amazing; however, the technology still seems niche, facing several challenges before its mass adoption. The appeal for 3D-printed casts isn't based on hype alone. They are thin, breathable, customisable, waterproof, easily removable, and prevent infection and muscle atrophy. In short, they outperform traditional casts in many ways. For in many ways, 3D-printed casts represent the natural evolution in casts.

To separate the hype from the fact, researchers investigated this technique's advantages over traditional casts. A study, conducted in 2017, found that 3D-printed casts "increased patient comfort and satisfaction." Another one in 2018 also found superior "patient satisfaction, comfort, and perceived functions" with 3D printed casts.

But the same study added that both conventional and 3D-printed casting techniques "demonstrate similar objective function" based on their functions and the dexterity they provide the wearer. Juan Monzón Fabregat the ex-CEO of Exovite, a company that used to manufacture 3D-printed casts itself.,shared a similar opinion. "The traditional splints are not that bad," he commented. "Of course, the personalised 3D-printed splint is a better product but is not better than the traditional ones to take a chance to change."

MODELS FOR SURGICAL PLANNING AND EDUCATION:

3D printing can also help medical research and the outcome of complex operations and particularly challenging cases. Researchers in China and the US have both 3D printed models of cancerous tumours to aid the discovery of new anti-cancer drugs and to better understand how tumours develop, grow, and spread. Bioprinted cancer models can even “mimic the 3D heterogeneity of real tumours.“

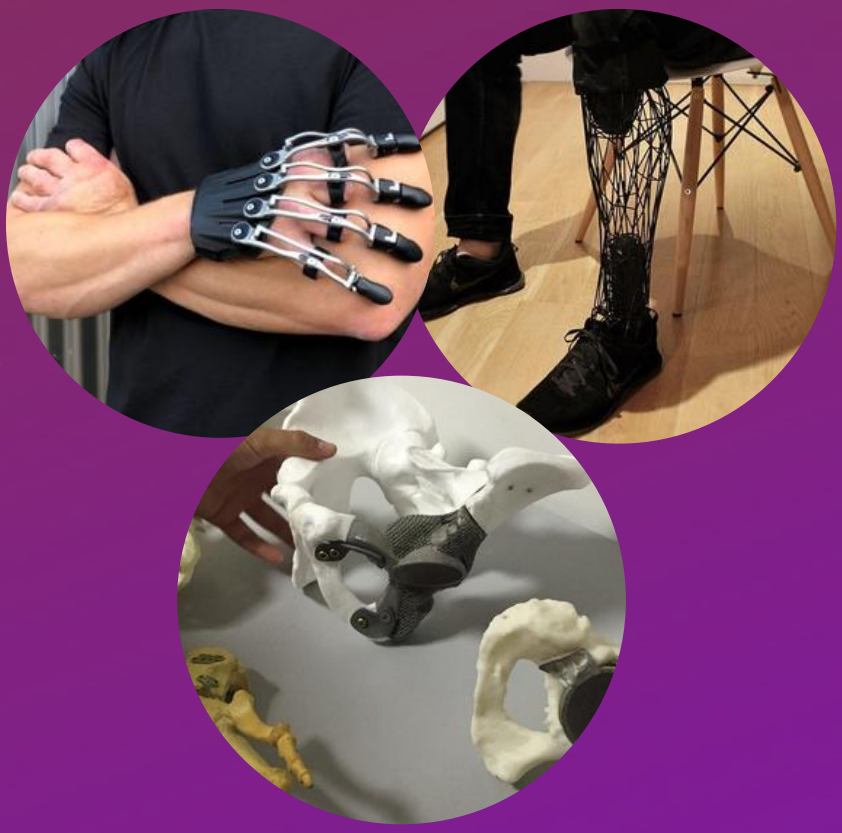
Researchers have also used scans of animal hearts to create printed models and then added flexible electronics on top of those models. The material can be peeled off the printed model and wrapped around the real heart for a perfect fit. The next step is to enhance the electronics with multiple sensors. 3D printing in medicine can be used to print organ models. These could also be helpful for patient education and pre-operative planning for surgeons. Just recently, scientists are using a combination of MRI and ultrasound imaging along with 3D-printing technology to help doctors prepare for fetal surgeries. With the 3D printed model, doctors can more easily identify potential obstacles and reduce the risk of surgery on babies with spina bifida, a congenital disability.

Another example is Schiner 3D Repro GmbH ‘s Digital Anatomy 3D printer. The device can help simulate anatomies and pathologies with ultra-realistic 3D printed models, reducing the need for human and animal cadavers, ensuring high repeatability and acceleration across the design validation process.

PROSTHETICS AND IMPLANTS:

Globally, over 30 million people need mobility devices such as prosthetics, while 80 percent of the world's amputees do not have access to modern prosthetics. However, creating traditional prosthetics is very time-consuming and destructive, which means that any modifications would destroy the original moulds. In collaboration with Autodesk Research and CBM Canada, researchers at the University of Toronto used 3D printing to quickly produce cheap and easily customisable prosthetic sockets for patients in the developing world.
NGOs like Refugee Open Ware and Not Impossible are also helping people in need with 3D printing in medicine. They create 3D-print prosthetics for refugees from war-torn areas. Not Impossible, for example, took 3D printers to Sudan, where the chaos of war has left many people with amputated limbs. The organisation's founder, Mick Ebeling, trained locals to operate the machinery, create patient-specific limbs, and fit these new, very inexpensive prosthetics.

Personalised medical implants could also be 3D printed. This is especially important in complex and rare cases. Back in 2014, Dutch surgeons replaced the entire top of a 22 year-old woman's skull with a customised printed implant made from plastic. The patient was suffering from a rare condition that caused the inside of her skull to grow extra bone, which squeezed her brain. The growth was discovered after she reported severe headaches and then lost her sight and motor control. If untreated, the extra bone would have killed her.



A novel 3D printing technique makes it possible to create astonishingly small and complex biomedical implants. Engineers and biomedical scientists at RMIT University in Australia created a 'reverse' 3D printing, versatile enough to use medical grade materials off-the-shelf. "The approach involves printing glue moulds that can then be filled with biomaterial filler. Once the mould is dissolved away, the biomaterial structure remains. Excitingly, the technique uses standard 3D printers, such as those now commonly even found in high schools, and PVA glue as a printing material." Imagine the possibilities of this achievement!

3D PRINTING BIOMATERIALS:

3D printing in medicine is a powerful tool for tissue engineering. No matter whether it is about blood, bones, heart or skin. It is the technology that lets your jaw drop and scares the hell out of you at the same time when you first encounter it.

1. BLOOD VESSELS:

Researchers at Harvard University were the first to use a custom-built 3D printer and a dissolving ink to create a swatch of tissue that contains skin cells interwoven with structural material that can potentially function as blood vessels in the future. The vasculature network enables fluids, nutrients, and cell growth factors to be perfused uniformly throughout the tissue.
As a next step, Korean engineers have created implantable 3D printed blood vessels and successfully implanted them into a rat. With the process, they hope to develop functioning artificial blood vessels needed to cure cardiovascular diseases.

2. BONES:

Professor Susmita Bose of Washington State University modified a 3D printer to bind chemicals to a ceramic powder creating intricate ceramic scaffolds that promote the growth of the bone in any shape. It helps hip and knee replacements last longer through developing a body-friendly calcium phosphate-based coating for the implant materials. Once integrated, the coated implants are expected to last longer – possibly doubling the life of cemented implants. Researchers, in the meantime, started using sea coral or graphene and ceramics to create bone-like structures with 3D printing.
And using a novel method at the University of New South Wales in Sydney, Australia, doctors can create new bone tissue during surgery exactly where it is needed. “We can go directly into the bone where there are cells, blood vessels and fat, and print a bone-like structure that already contains living cells, right in that area”, – said Associate Professor Kristopher Kilian, who co-developed the technology in the university statement.

3. HEART VALVE:

Jonathan Butcher of Cornell University has 3D printed a heart valve possessing the same anatomical architecture as the original valve. It will soon be tested in sheep. He used a combination of cells and biomaterials to control the valve's stiffness. Butcher believes bioprinting will gain much more traction in the tissue engineering and biomedical community over the next five years, potentially becoming the standard in complex tissue fabrication.

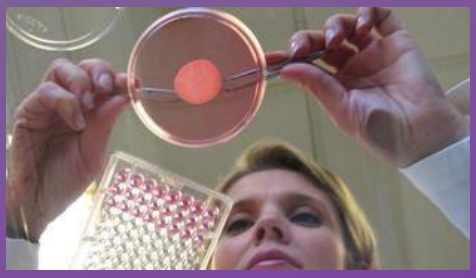
4. REPLICATING HUMAN EARS/NOSES:

Lawrence Bonassar of Cornell University used 3D photos of human ears to create ear moulds. The moulds were then filled with a gel containing bovine cartilage cells suspended in collagen, which held the shape of the ear while cells grew their extracellular matrix. They created the replica of a human ear:

Canadian scientists have printed synthetic noses for skin cancer patients. The printing used real human nose cartilage cells, donated by people having nose jobs, with collagen-based hydrogel. The nose job requires surgery, though, while Chinese scientists started research on mice printing the ear directly inside the animal.

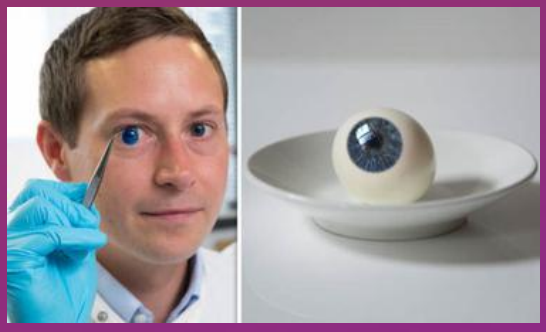
5. SYNTHETIC SKIN:

In 2017, James Yoo at the Wake Forest School of Medicine in the US and researchers at the University of Madrid have developed the prototype of a 3D printer that can create synthetic skin. It is adequate for transplanting patients who suffered burn injuries or have other skin issues. It may also be used in research or the testing of cosmetic, chemical, and pharmaceutical products. A significant step forward for skin grafts and burn victims is the development of living skin. Researchers at the Rensselaer Polytechnic Institute developed a method to 3D-print living skin along with blood vessels.



6. SYNTHETIC ORGANS:

When talking about 3D-printed organs, people tend to think of a machine that can create readily available, implantable human organs. However, the reality is far from this optimistic image. Researchers worldwide are working on possible solutions: Organovo successfully bioprinted liver tissues already in 2014. They then seemed to be 4-6 years away from printing liver parts for transplantation. Together with the Murdoch Children's Research Institute, Organovo even created miniature human kidneys in the lab.



Bioprinted organs could also be used in the pharmaceutical industry to replace animal models for analysing the toxicity of new drugs. Technological solutions like BioAssemblyBot and entirely new methods that can lead to patient-specific heart tissue printing will eventually lead to success: industry leaders expect a breakthrough in about a decade. In an interview for our Patreon site, Erik Gatenholm, CEO of CELLINK, said, "we will see fully functioning organs within the next decade or so."

THE FUTURE OF PHARMA: 3D PRINTED DRUGS:

In 2015, the FDA approved the first-ever drug made by 3D printers, and in 2021, the second such medication received approval. Chinese pharmaceutical company Triastek, Inc. has received Investigational New Drug (IND) clearance from the FDA for its first 3D printed drug product, T19, which is designed to treat rheumatoid arthritis. Fantastic news for the industry as it opens up a range of opportunities to bring the supply chain to the following level.

3D printing of multiple medicines on a single pill, known as a polypill, is already possible. In 2020 FabRx released the first pharmaceutical 3D printer to manufacture personalised medication. 'M3DIMAKER' can print personalised medicine real fast – about 28 pills/minute. Imagine how fast the distribution of medication could be with a 3D printer in pharmacies!
Or imagine how different our attitude towards pharmacies would be if we could print out pills at home.

MEDICAL 3D PRINTING – AN INDIAN PERSPECTIVE

India has a vast segment of highly qualified doctors who deal with some of the most complex surgeries known across the world. Yet, with a population of over 1.3 Billion and over 1 Million people undergoing surgeries every year, they are highly short-staffed, with a ratio of 1:1600 as opposed to WHO norm of 1:1000 with 80% in urban areas. This gives rise to the need for innovation in processes and technology that can make surgeries faster, easier, and more precise for the medical team. This allows medical personnel to cater to more patients in the same amount of time, with fewer chances of failure, thereby avoiding a recurrence of the condition. One of the most effective ways to cater to this problem is to obtain dependable pre-operative information and customized tools to ensure the treatment is smooth and effective in the first attempt. Such a complex problem can have a simple solution, utilizing additive manufacturing, commonly known as 3D Printing.

Anatomiz3D's foundation was formed on a case of an infant suffering from a complex cyanotic congenital heart defect called DORV (Double Outlet Right Ventricle) with a large remote VSD (Ventricular Septal Defect) and 2 adequate sized ventricles. Many surgeons were doubtful to perform this complex surgery on a 6-month-old baby. To find a solution, the surgeon opted for a 3D printed heart model. This model played a crucial role for the surgeons to plan the surgery and perform it smoothly. It was the first surgery performed across the whole of the soft tissue vertical using the 3D printing technology in India.

3D printing in medicine is one of the most disruptive technologies that truly have the potential to change medicine and healthcare by making care affordable, accessible and personalized. It can bring a new era if printers become more sophisticated, printing biomaterials gets safely regulated and the general public acquires a common sense about how 3D printing works.

SUSANTA GUPTA
3rd YEAR
ME DEPARTMENT

MECH THINK

2K22-23

VISIT TO KUMARTULI

PLACE WHERE HUMAN BRING INTO BEING A GOD

VISIT TO KUMARTULI

PLACE WHERE HUMAN BRING INTO BEING A GOD

Kolkata is known for its traditional potters' quarters. It is home to several talented potters who toil tirelessly to create clay idols for several generations.

I have always wondered how these beautiful idols are sculpted, how long it takes to craft the idol so intricately. So whenever I get an opportunity to visit Kumartuli, I don't miss a chance.

The potters live here with their families and have their own studios. The place is very congested with just small windows and no proper ventilation. They use very basic equipment like clay, straw, ropes, bamboo sticks, and mundane things to create art pieces so vivid, stylized, and grand that it evokes lifetime awe.

People from all over the world come here to see the place and you can peep into the workshops to see the sculptors at work anytime of the year. You will find rows of idols on either side.

Visiting Kumartuli once in your life will be a great experience.

SHAUNAK BANERJEE
4th YEAR
IT DEPARTMENT

MECH THINK

2K22-23

LIFE

A

TRAGEDY FOR AN EMPATH

AND

COMEDY FOR A THINKER

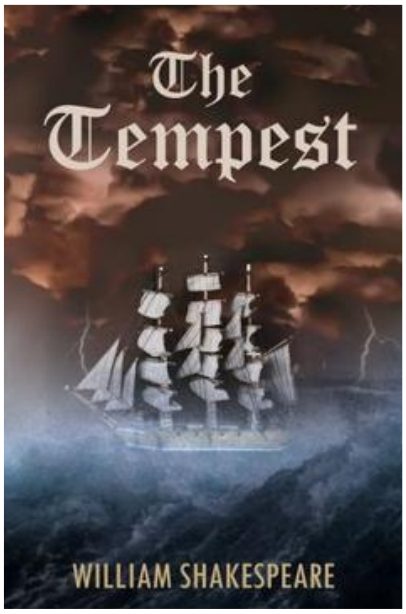
LIFE

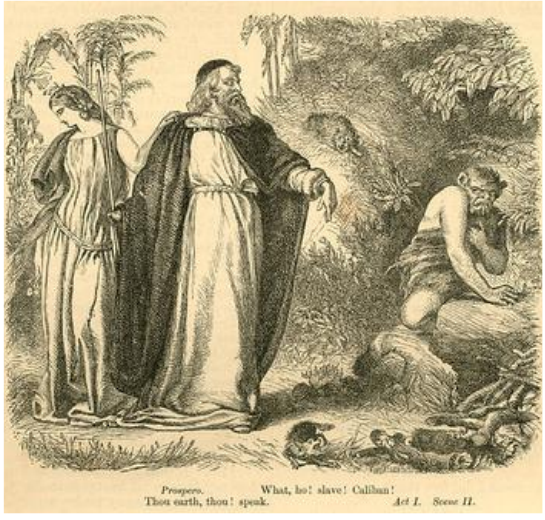
A TRAGEDY FOR AN EMPATH AND COMEDY FOR A THINKER

"LIFE IS A TRAGEDY TO THOSE WHO FEEL AND COMEDY TO THOSE WHO THINK."

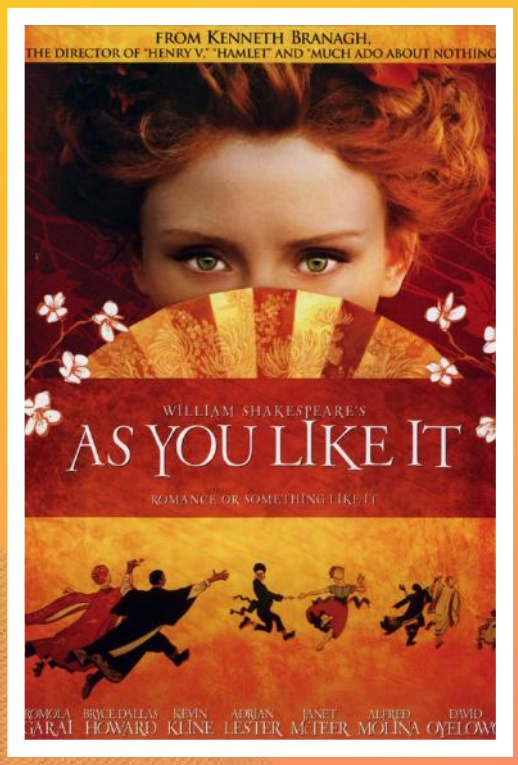
This remark by Horace Walpole, in the 18th century philosopher points to the essential difference between tragic outlook and comic vision. Life is a comedy to those who stand aloof and take a disinterested view of life. Viewed from reason and intellect, life is a comedy, but for the man who has emotional attitude to life, who is emotionally identified with the problems of life, life becomes tragic.

There are two attitudes literary appreciations- involvement and detachment. If the readers are involved in fortunes and fluctuations of the characters, characters are tragic but if they look at the characters from distance, with detachment , the characters are comic. Prospero in the tempest has no involvement in what is happening, he does not feel about his own predicament- because he has attained a lofty height of detachment and disinterestedness through his intellectual grasp of things. For him life is a phantasmagoria-a dream of which men are made. From the vintage point of Prospero who has attained the magical power by his industry and scholarship, the evils cease to have any meaning. Keats has said, “to think is to be full of sorrows”. But actually, Keats think with sensibility and emotion, and not with reason and experience.

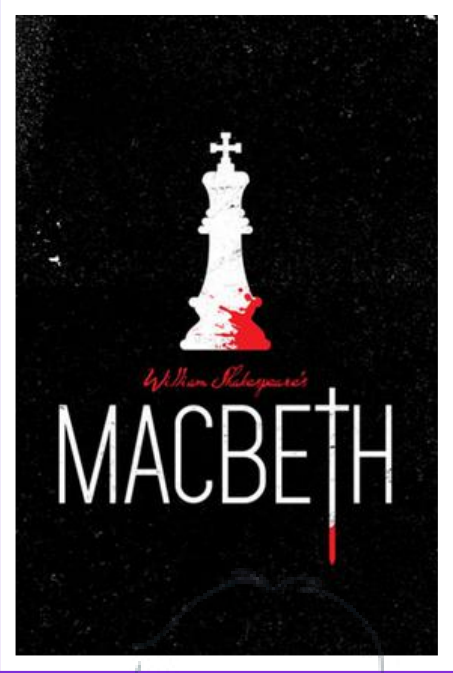




Touchstone and Jaques in as you like it represents two standpoints. Touchstone posseses a sharp insight and also a capacity for searching analysis, and it is this intellectual attitude which makes him of critical of human absurdities in all spheres of life. But his criticism is enlivened by fun and humour. He keeps a cheerful frame of mind under all circumstances. He laughs at the absurdities of the characters and at the same time loves them because he knows that they are part of human life. He can rise above a sense of superiority and stand on the same level with those whom he mocks. From his point of view life is essentially ludicrous and funny. Jaques on the other hand is sentimentalist. He is moved to tears at the sight of sobbing dear. He moralises on it in a thousand similies. He indulges in sad reflections on life and he does not find good in anything. Jaques's cynicism is sentimentalism turned inside out. His sensibility has made him bitter with himself, and life is tragic for him. He cannot accept life because because he feels and his feelings are diseased. A pessimist or a cynic is a tragic character because it is his sensibility and sentiment that shape his character.

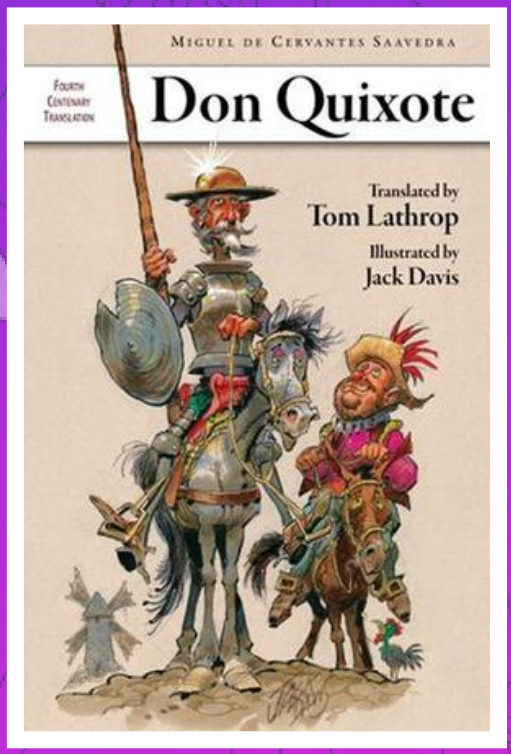


A comedian looks at life with intellect and thought. Chaucer is a disinterested spector of life and so he can glance at the weakness and frivolities of the charecters-even religious men and women with sympathetic humour. He loves life's variety and his vision is enriched with his profound thought. He has not allowed his intellect to be warped by sloppy sentimentalism.



Shakespeare Can create an astonishing variety of characters and look at the bright as well as the seamy side of life with detachment and disinterestedness because he can think deeply and comprehensively. Macbeth becomes pessimistic because he feels that he has made a waste of life, but Shakespeare cannot because he feels that life is a mingled yarn woven of good and evil. His vast experiences have encouraged an intellectual attitude to life.

There are comic characters who have this intellectual attitude. Don Quixote, Falstaff and Micawber are comic characters because they are not disturbed by sentiments and emotion. They live their own careless, irresponsible life little caring for what others are thinking of them. They do not feel, they are not emotionally involved in what they do and how they behave, they have detached intellectual attitude. Macbeth sees ghost and is disturbed by it because he feels the anguish of conscience, but the porter sees visions and remain comical because he is not involved.



Classical literature enjoys on this balance and poise that can be achived by cultivating the brain along with the heart. Romantic poets are emotionally identified with what they write. Their feeling is intense and their emotions are strong. They feel the tragedy of life. But the classicists stand apart and look at life more less with detachment. There is a balance of empathy and detachment, in their attitude. Feeling has to be combined with thinking in order to achieve balance in personality. Romantics condemn rational thinking and eulogise imagination and emotion. But emotions untampered by intellect tend to become sloppy sentimentally which prevents correct apprehension of life. Comic attitude is the zest and ardour of life. Shakespeare deals with tragic issues but he shows his sanity of outlook by depicting the problems and predicaments of life with the attitude of humourist. He can enter the character of a hero and a villain alike. It is this 'negative capability' that makes his character so living, so lively, so vital.

LITERATURE

RAMYADEEP BARMAN
3rd YEAR
ME DEPARTMENT

MECH THINK

BI-ANNUAL E-MAGAZINE

Articles, Hand sketch and Photography are invited for upcoming publication. Guidelines for submission to the magazine:

1. Topic of Article: Technical or Literature 2. Language: English, Bengali, Hindi.

3. Word limit: 3000

4. Articles are to be send as Microsoft Word document.

5. For Photography send photos with specifications mentioning ISO, SHUTTER SPEED, and APERTURE.

6. Provide particulars: NAME, Roll no/Registration No., Year, Branch/Department, Institution, and Contact Number.

7. Student of any educational institute can send their creations.

8. Send your softcopy to mechthink.v1@gmail.com Feel free to send your feedback to mechthink.v1@gmail.com.

Dr. B. C. ROY ENGINEERING COLLEGE, DURGAPUR

(Approved by AICTE & Affiliated to MAKAUT, WB)

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☎ : (0343) 250-1353/4106/4121/4245, 6297128554, Fax : (0343) 250-4059
E-mail : info@bcrec.ac.in • Website : www.bcrec.ac.in

To
The Project Director,
Project Implementation Unit,
NHAI, Durgapur.

Sub: Request for approval for One-Day Site Visit in the Panagarh- Palsit Stretch with 35 Students

Sir,
We wish to organize a site visit for one day, preferably on 18th March, 2023 in the Panagarh-Palsit stretch as a part of the MoU between NHAI & BCREC (Ref: 11021/3/2020/PIU(DUPJBCREC/4315 dated 28.10.2020), where the construction work is going on. We wish to visit a few different types of construction works like the approach of a flyover, base-course preparation, preparation of surface course etc. 35 UG students from our department will be there along with 3-4 faculty members including me.

Hence, I request you to do the needful and allow our students to visit the construction sites under your purview.

Regards,

Sanjay Sengupta 09/02/2023

Sanjay Sengupta,
Head, Department of Civil Engineering,
Dr. B. C. Roy Engineering College, Durgapur,
Jemua Road, Fuljhore, Durgapur- 713206.

H.O.D
CIVIL ENGG. DEPT.
Dr. B. C. ROY ENGINEERING COLLEGE
DURGAPUR

DR. B. C. ROY ENGINEERING COLLEGE ★ Durgapur

Department of Civil Engineering, BCREC	
Eligible Students for One-Day Site Visit	
Name	**Roll No.**
SABYASACHI NANDI	12001321052
RAVI KUMAR	12001320015
SONALPRIYO BANERJEE	12001321060
DEEYA CHATTOPADHYAY	12001320025
MIRZA SARIFUL ISLAM	12001321064
PRAKASH DE	12001321070
NIRAJ KUMAR	12001320002
PRITAM BISWAS	12001321010
SUBHAJIT PRADHAN	12001321012
SUSMITA BAURI	12001321051
ATANU SINHA MAHAPATRA	12001321058
BASU BHOWMICK	12001321008
MD ADIF NAUSHAD	12001320021
ABHISHEK KUMAR	12001320023
JHILIK BANDYOPADHYAY	12001321050
MANISHA DEY	12001321016
AVIJIT CHAKRABORTY	12001321044
SAIKAT SAMANTA	12001321062
SUBHAJIT BANERJEE	12001321065
SOUVIK BHADRA	12001321072
SOUMODEEP DAS	12001320024
SUBIR GHOSH	12001321069
RANJEET KUMAR MANDAL	12001320001
SK FARHAN ASHIQ	12001321009
BISWAPRIYA BANDYOPADHYAY	12001321011
ARITRA MONDAL	12001321057
MD ANAJ KHAN	12001321063
SUBHAJIT DANDAPAT	12001321073
KASHI NATH BHADRA	12001320013
SUBHAJIT KAURI	12001321007
SUBHADEEP MONDAL	12001321015
SONU KUMAR	12001320003
DEBDEEP KOLEY	12001320007
SAGEN MARANDI	12001320012
KAZI FAHIM FAISAL	12001320020
AMRIT SINGH	12001320018
DEEP BANERJEE	12001321053
MOHAMMAD SAIFUZZAMAN	12001321045
SABYASACHI GHOSH	12001321013
PARTHA SARATHI MAJHI	12001321046
SUBHAJIT DUTTA	12001321071

Soumyadip Das

Sanjay Sengupta
H.O.D. I.C.E.
Dr. B. C. Roy Engg. College, Durgapur

Dr. B.C Roy Engineering College, Durgapur

(Internal-Note-Sheet)

Memo No: BCREC/2022-23/20(Budget)/CE/PR **Date:** 02-Mar-2023

To: General Secretary

From: HOD / CE

Sub: Request for fund approval for one day site for 3rd Year CE students to Panagarh- Palsit stretch under the 'Training and Travel Budget fund' of the Civil Engineering Department for the FY 2022-23.

Dear Sir,

This is to inform you that the Departmental Budget Committee has gone through the approved budget for Civil Engineering Department for the FY 2022-23 and has finalized the one-day site by 3rd Year CE students to Panagarh-Palsit stretch under the 'Training and Travel head'.

The committee has discussed and approved the proposal of **Rs. 9350/- (Tentative)** for the bus expense for the Industrial visit and flex printing cost for publicity purposes.

Therefore, it is requested to you kindly sanction the amount of Rs. 9350 (Nine thousand three hundred and fifty only), from the approved budget amount under the 'Training and Travel' head.

Forwarding office	Remarks	Comments by other offices required for clarifications / comment	Signature with Date
HOD,CE	The approval for NHAI site visit has been received. The required expense for travel and flex printing may kindly be approved.		Sanjoy Sengupta 02/03/2023
Registrar	OK		2/3/2023
Vice Principal	Submitted for kind approval		3/3/2023
Principal	Recommended for the travel expenses for Industrial visit of civil Engineering students		03/03/2023
General Secretary	Approved		3/3/2023

No. 12

BILL

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Address Durgapur

Sl No.	PARTICULARS	Rs.	P.
1.	1 Pc Flex Print - 6' x 4'		
	"site visit NHAI"		
	Department of Civil Engineering =	312.	00
	17/03/23		
	TOTAL	312.	00

Date 19/3/23

Amal Roy
Signature

Form No. : 57

South Bengal State Transport Corporation

DURGAPUR - 713201

No. A. 4091

Date 6/3/23

Received from Mr. Alak Kahali B.C.Roy College

Rs. 10360/- (Rupees Ten thousand three hundred sixty only) on account of Hiring charge of SBSTC Bus on 18/3/23 Dept. to Bandwan as per ND: DTO/135/5/SBSTC Dt- 3/3/23

Hiring Ch. 7510
GST 1350
Toll 500
Sanity 1000
10360

Rs. 10360/-

18/3/23

Head Cashier / A.H.D. Cashier / Cashier
South Bengal State Transport Corporation

To
The D. I.
SBSTC, Durgapur

Sub: Refund of the Security Deposit

Sir,

I Soumyadip Das, on behalf of Dr. B.C.Roy Engineering College, Durgapur wish to get back the security deposit of Rs. 1000/- for the booking of a bus on 18th march, 2023. We started at around 8:30 am (the bus started from the depot at around 8:00 am) & the journey completed at around 4:00pm & the bus thereafter returned to the depot.

Kindly approve my request.

Security In charge
Please put up
in time -
out time -

Out time - 08/00 AM.
In time - 16/17 P.M.

21/3/23

Will be get full refund of Rs. 1000/- (Rs. One thousand only) as a security deposit money.
21/3/23

Thanks & regards,
Soumyadip Das,
AP, Dept. of CE,
BCREC.
M - 7908017716

Received, Rs. 1000/-
Soumyadip Das
21/03/2023