

**SEP
2023**



CIVILOHOLIC

BY DEPARTMENT OF CIVIL ENGINEERING

**VOLUME
3**

**DR. B.C. ROY ENGINEERING COLLEGE
DURGAPUR**

Editor's Message

Dear Readers,

It 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. Koynndrik 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

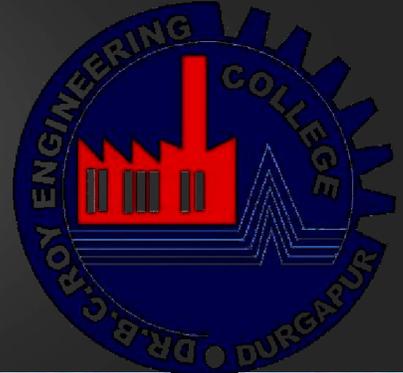
Civil engineers shape the physical environment from the cities and buildings we live in, the way we travel such as the highway networks, bridges, railways, tunnels, the dams and water systems, the power plants and transmission towers, and what not. Civil Engineering is a profession wherein the knowledge 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

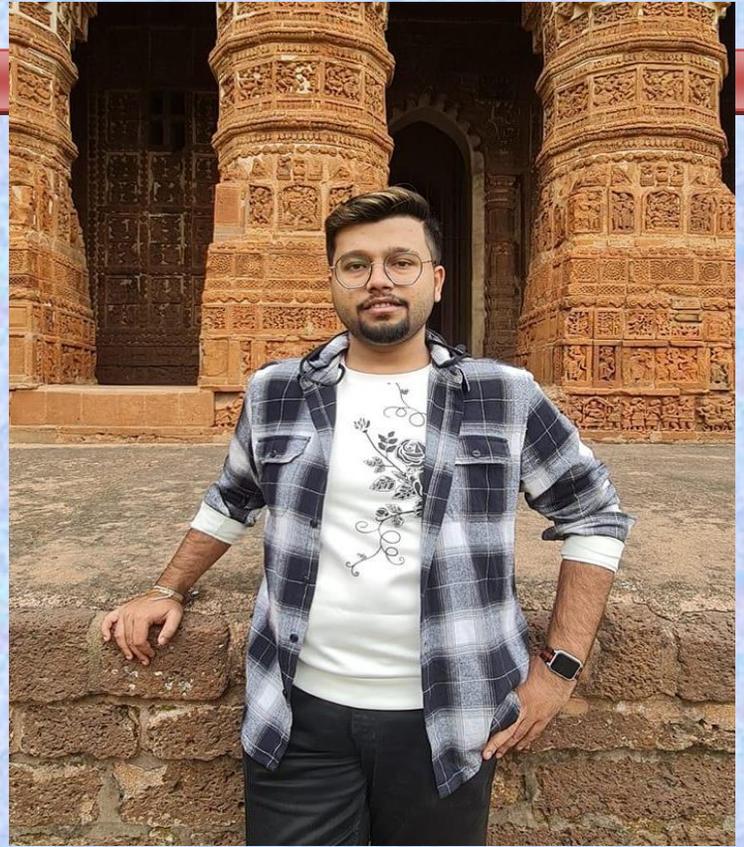
- Solid Mechanics Lab
- Surveying and Geometrics
- Fluid Mechanics Lab
- Engineering Geology Lab
- Soil Mechanics Lab
- Concrete Technology Lab
- Computer Aided Drawing Lab
- Water Resource Engineering Lab
- Environmental Engineering Lab
- Material Testing Lab
- Highway & Transportation Engg. Lab



ADVISORY COMMITTEE

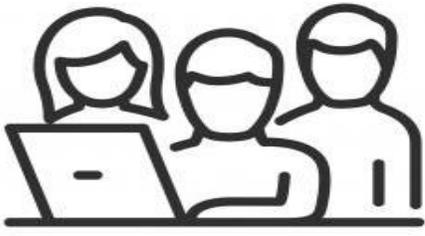


Prof. Anupam Kr. Biswas
Civil Engineering
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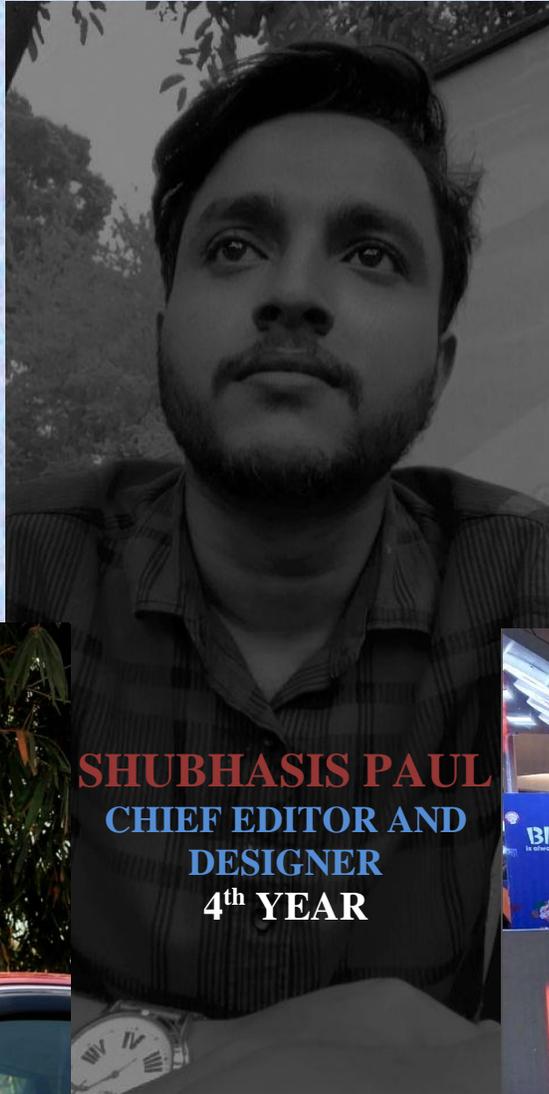


Prof. Koyndrik Bhattacharjee
Civil Engineering
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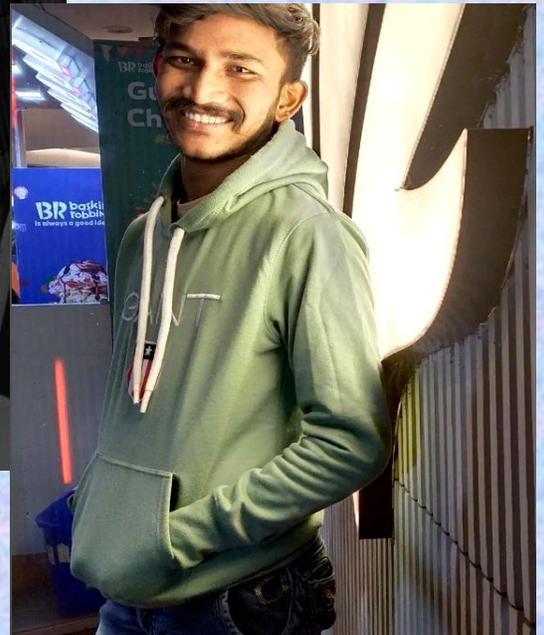




The Editorial Team



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.

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 throughout 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!



Articles-

1. What is Civil Engineering?
2. Can AI replace Civil Engineers?
3. Transportation Engineering
4. Smart Cities
5. Water Management System of Netherlands
6. 3d Printing Technology
7. Bamboo as a Reinforcement Member
8. Bitumen Emulsion
9. Imbalance between Software & Civil Engineering
10. Water Treatment

Poems & Story.

1. Sovvota
2. Maa
3. An Engineer's Valentine
4. 7 Days

Drawing & Photography-

5. Drawings
6. Photography

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.

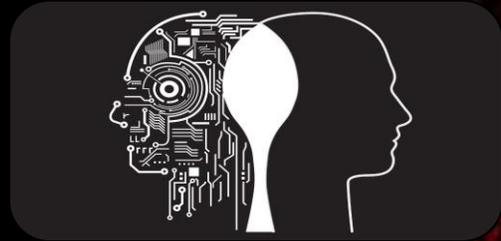
Civil Engineer responsibilities include: Managing, designing, developing, creating and maintaining construction projects. Conducting on-site investigations and analyzing data. Assessing potential risks, materials and costs.



Shubhasis Paul
4th Year
Department of Civil
Engineering



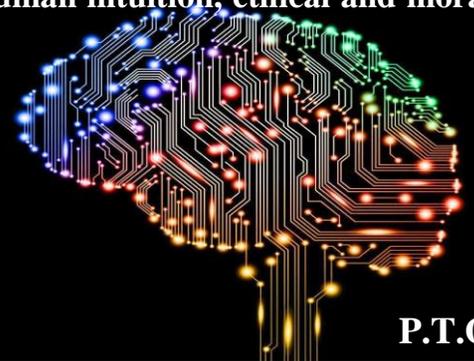
Can AI replace Civil Engineers?



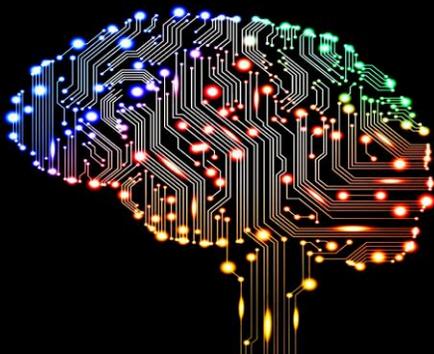
Artificial intelligence (AI) is an aggregative term for describing when a machine mimics human cognitive functions, like problem-solving, pattern recognition, and learning. AI has the potential to assist civil engineers in their work, but it is unlikely to completely replace them in the near future. 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.



- 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.

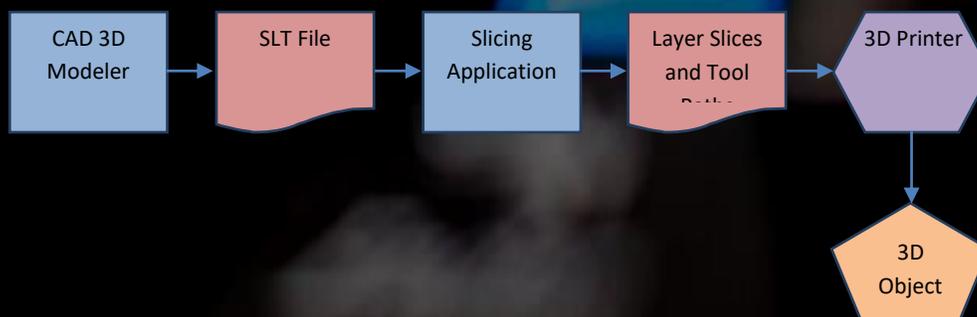


Figure Typical work-flow of 3D printing process.

➤ *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 for this 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 3D printing. 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 Figure 3.

➤ *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.

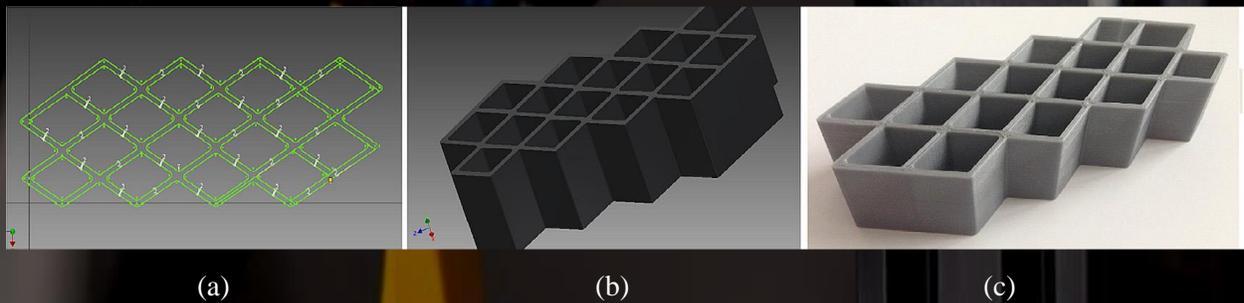


Figure: (a) 2D sketch; (b) 3D model; (c) printed replica of a Canal House wall.

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, microsurfacing 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

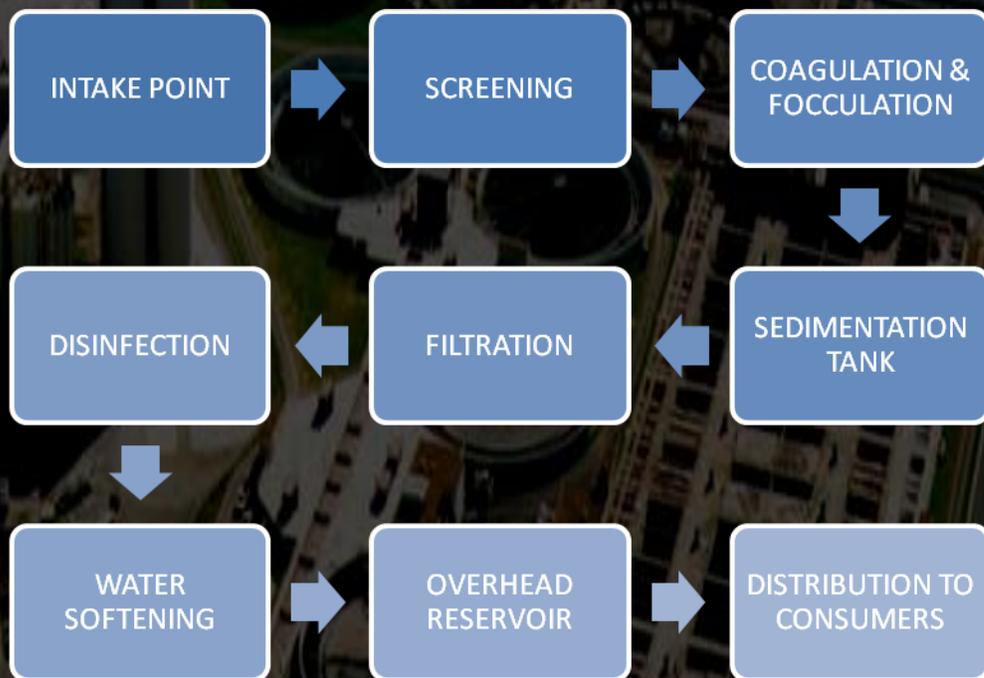
3rd Year

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, minerals, 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 collect 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 types 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 aluminium sulphate 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.

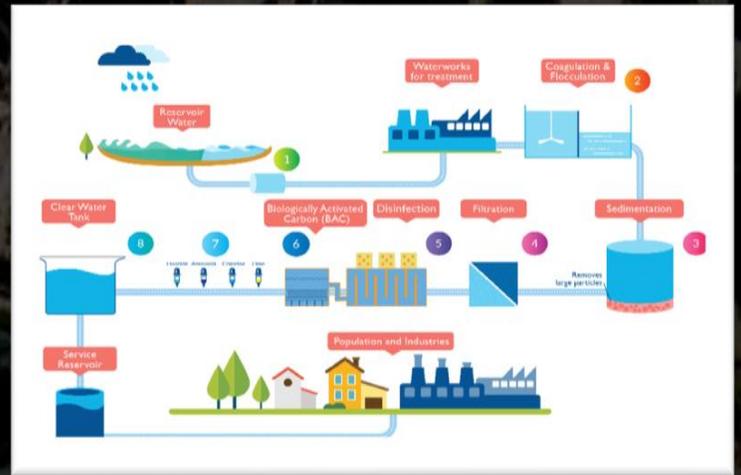
Filtration: Solids are separated from a liquid. In the water treatment, the solids that are not separated in the sedimentation tank are removing by passing water through sand and gravel beds. Filters are two types - slow sand filter & rapid sand filter.

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

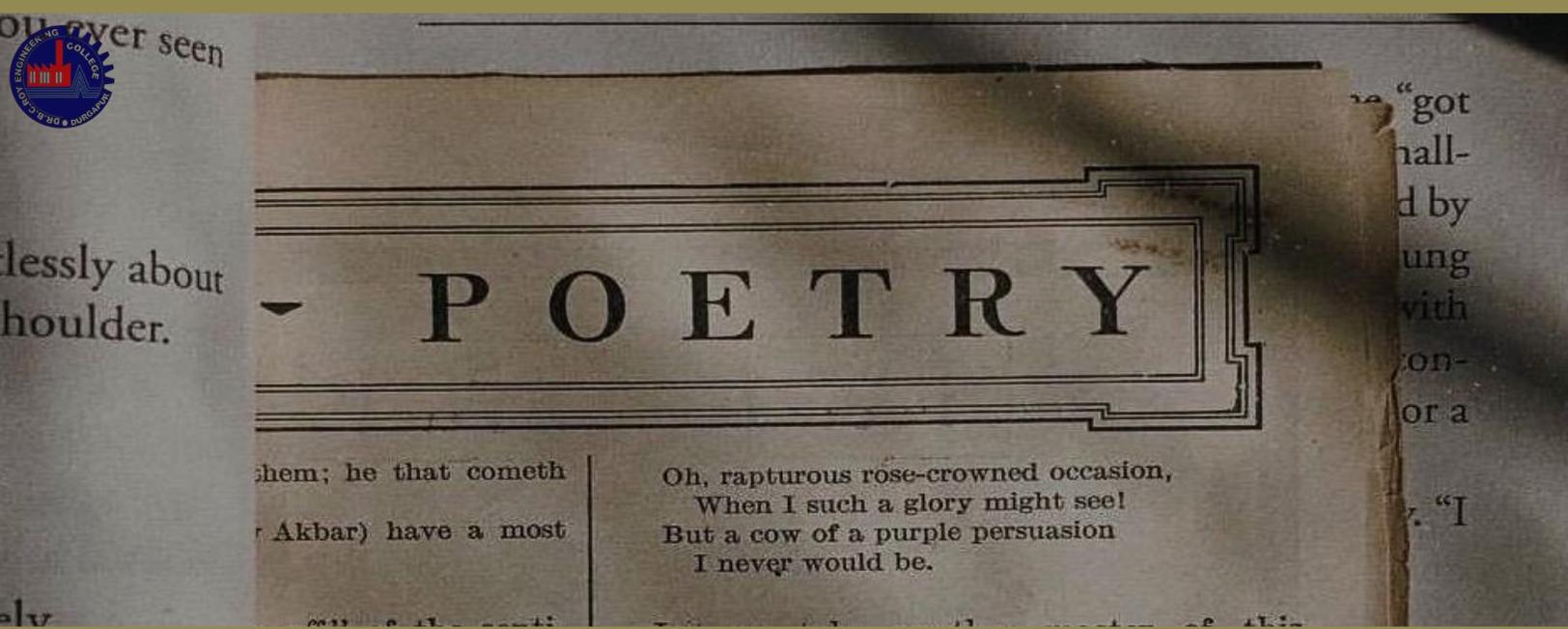
Water softening: To reduces hardness from water, corrosive effect on pipes and improves the taste of food, life of fabrics. Ion exchange is a common industrial method of water softening.

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





**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-
আর সভ্যতার চাকা- ক্ষতি কি?
যেখানে ছিল না-

তুমি আমি

মিডিয়ার রঙচঙে খবর বেচাকেনা,
ফেসবুক, হোয়াটসঅ্যাপের 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 যাদুकर
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



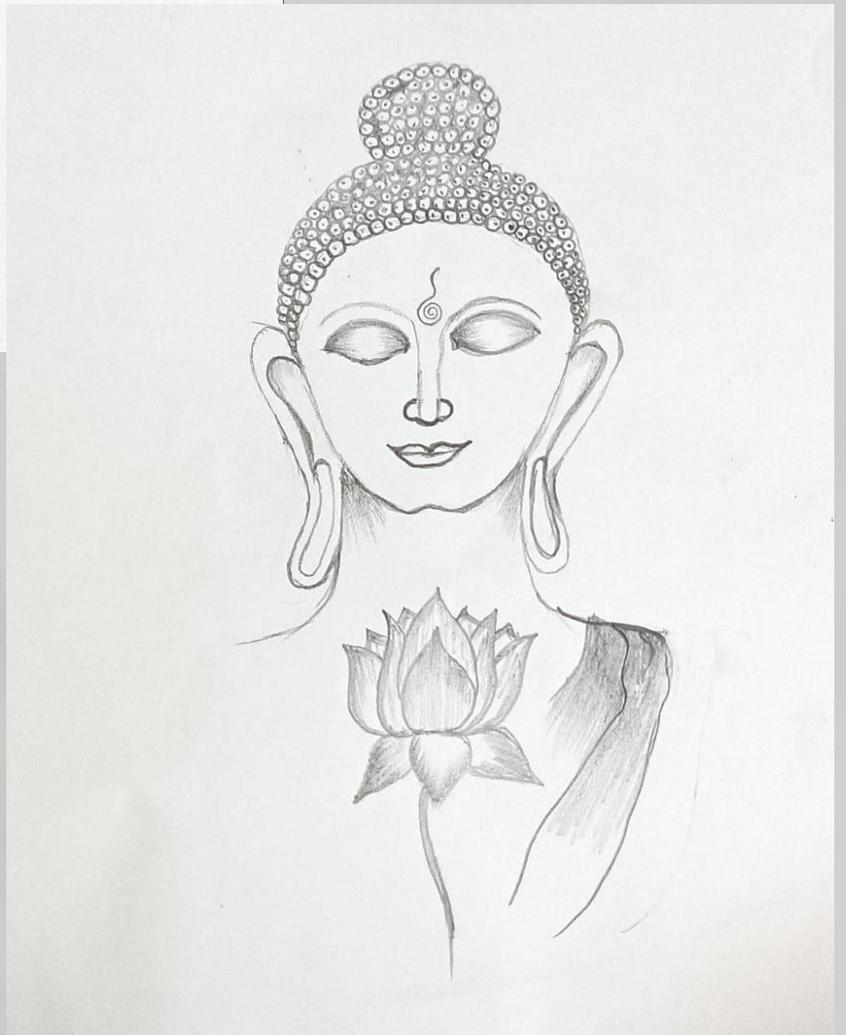
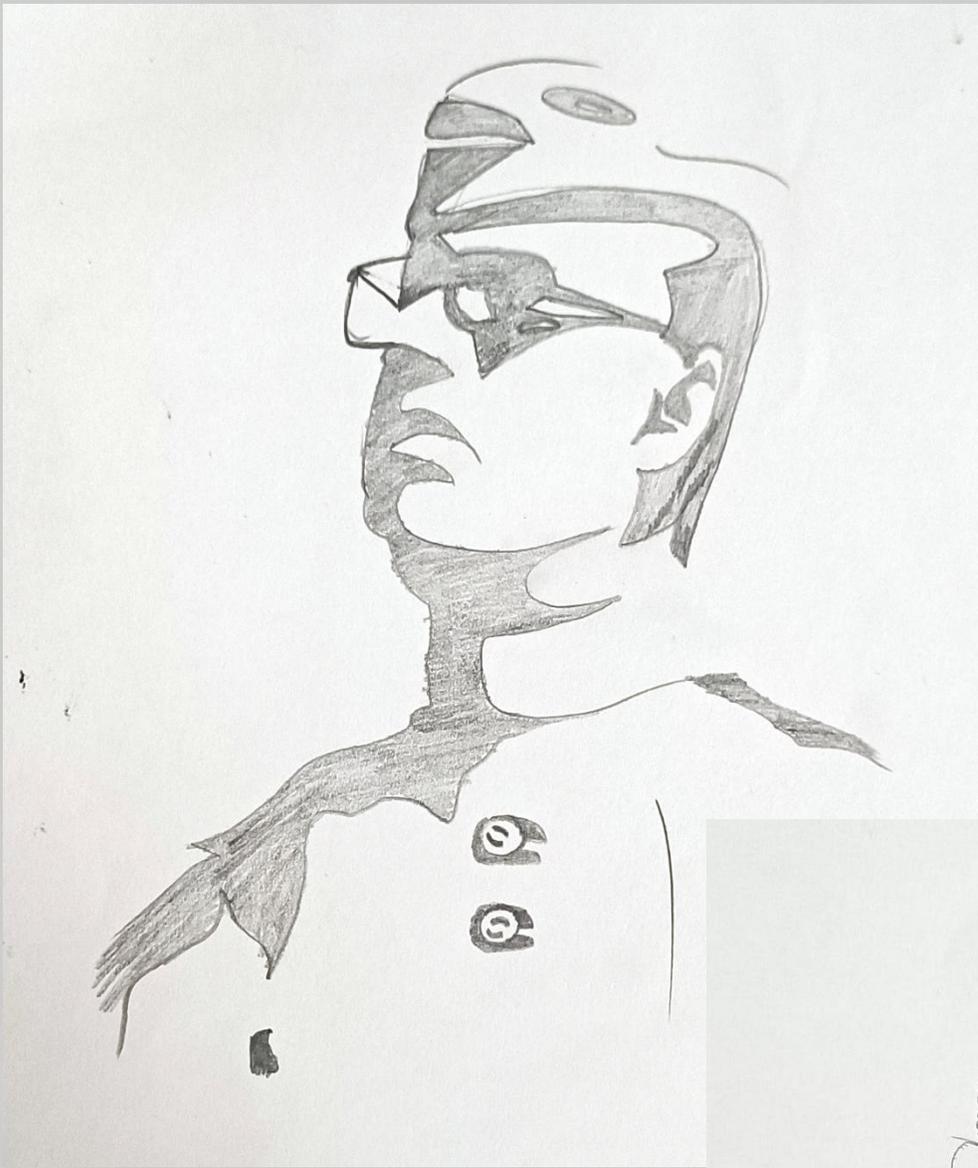
Sayan Pathak
3rd Year
Department of Civil Engineering



Manisha Dey

4th Year

Department of Civil Engineering



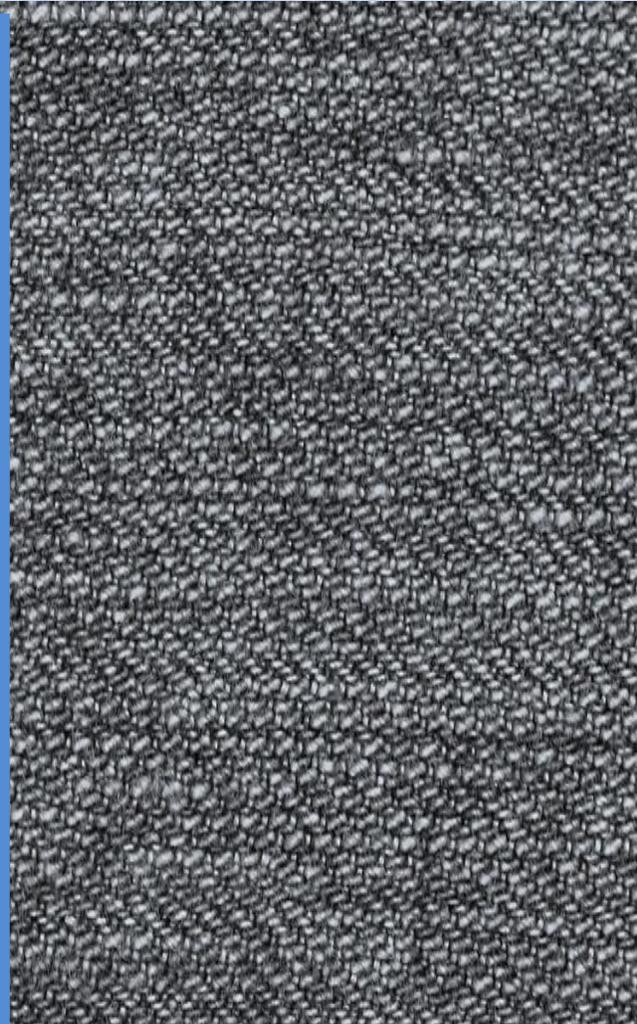
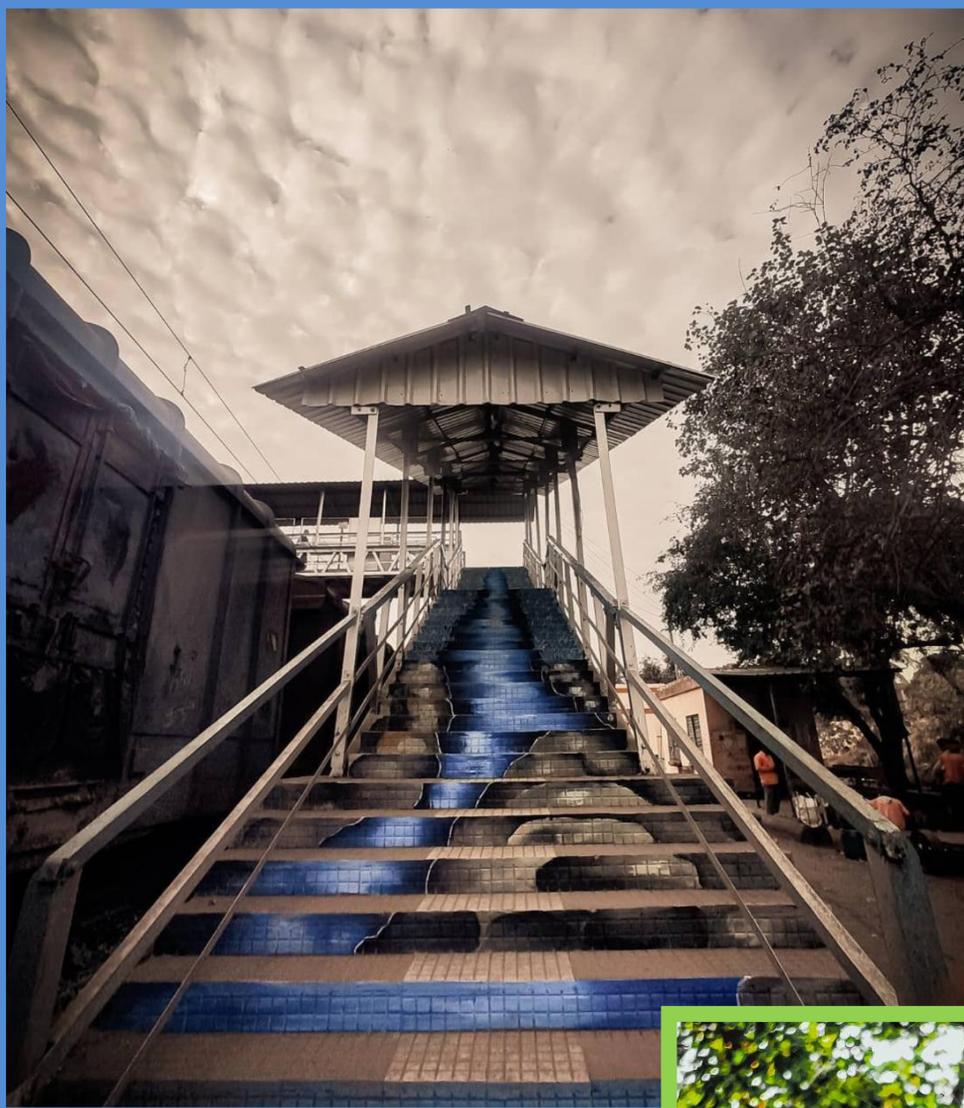
Jhulik Bandyopadhyay
4th Year
Department of Civil Engineering



photography

Photography is an art of
teleporting the past into the future.

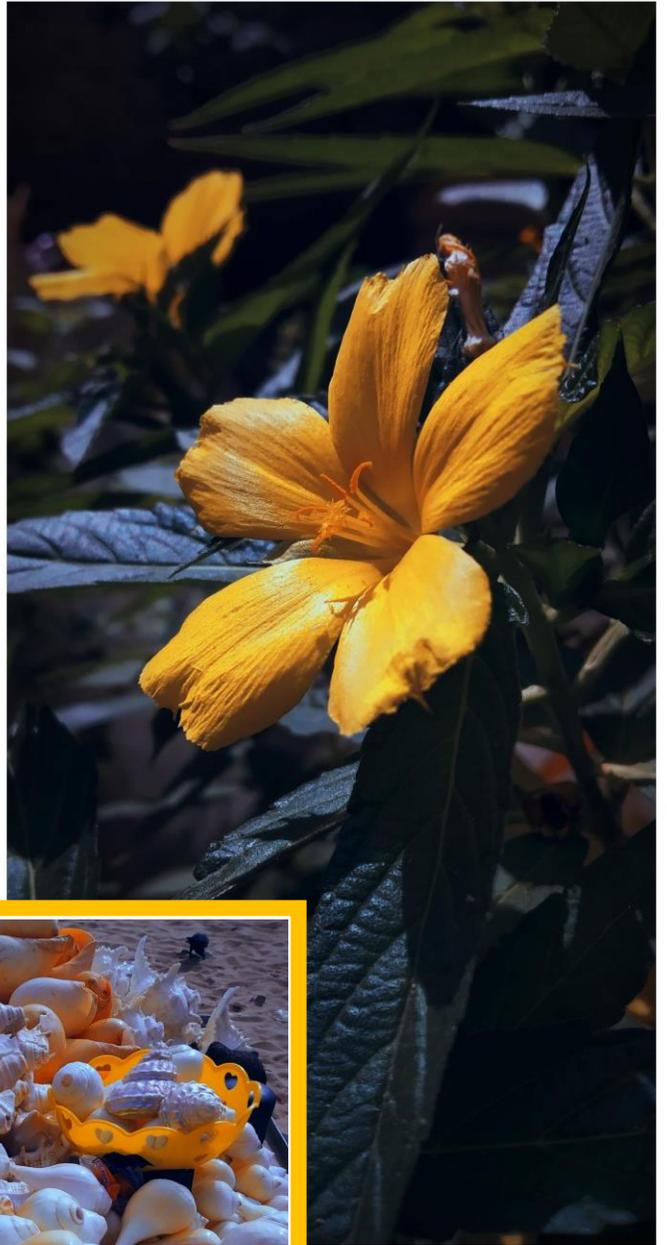
Mehmet Murat ildan



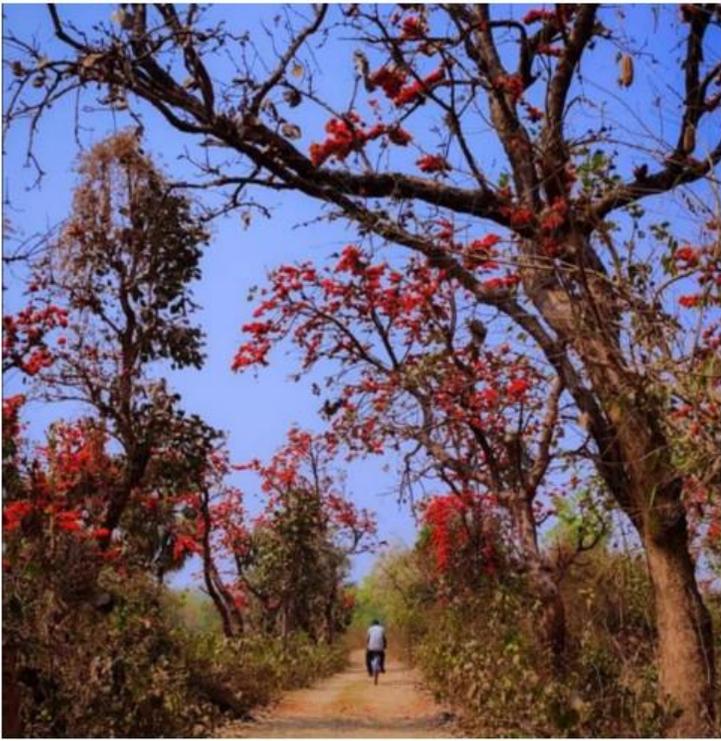
Rethik Das

4th Year

Department of Civil Engineering



Dipika Sen
3rd Year
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Shuvam Majee
3rd Year
Department of Civil Engineering



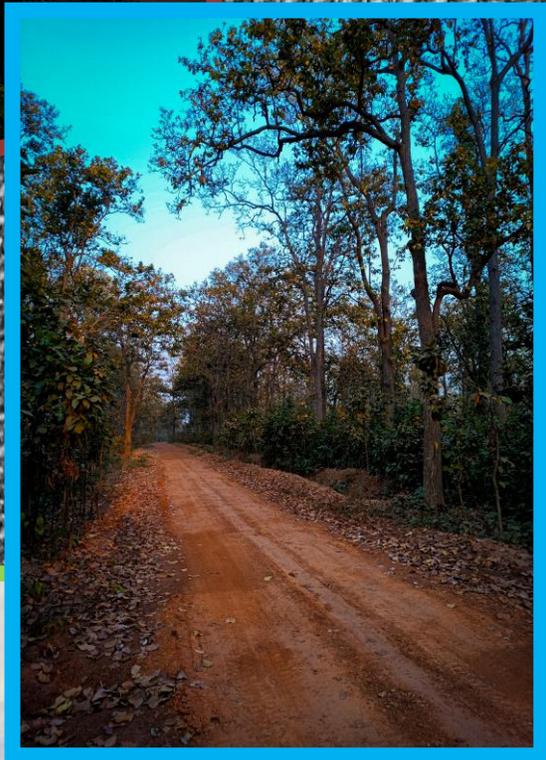
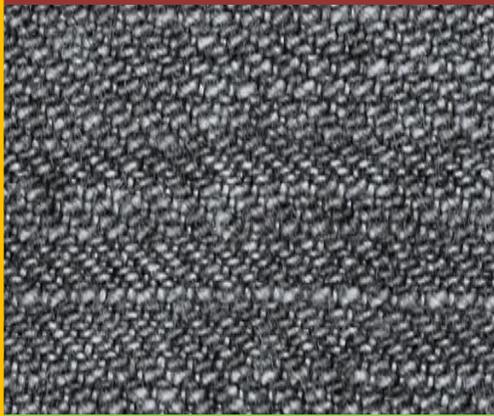
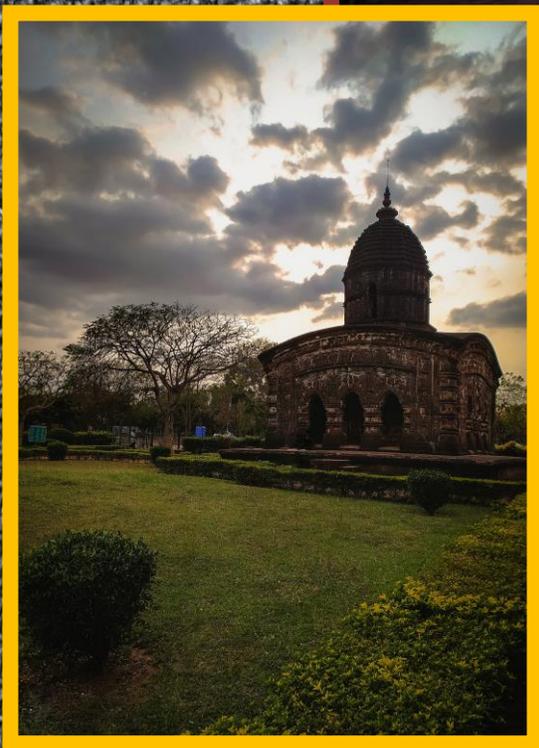
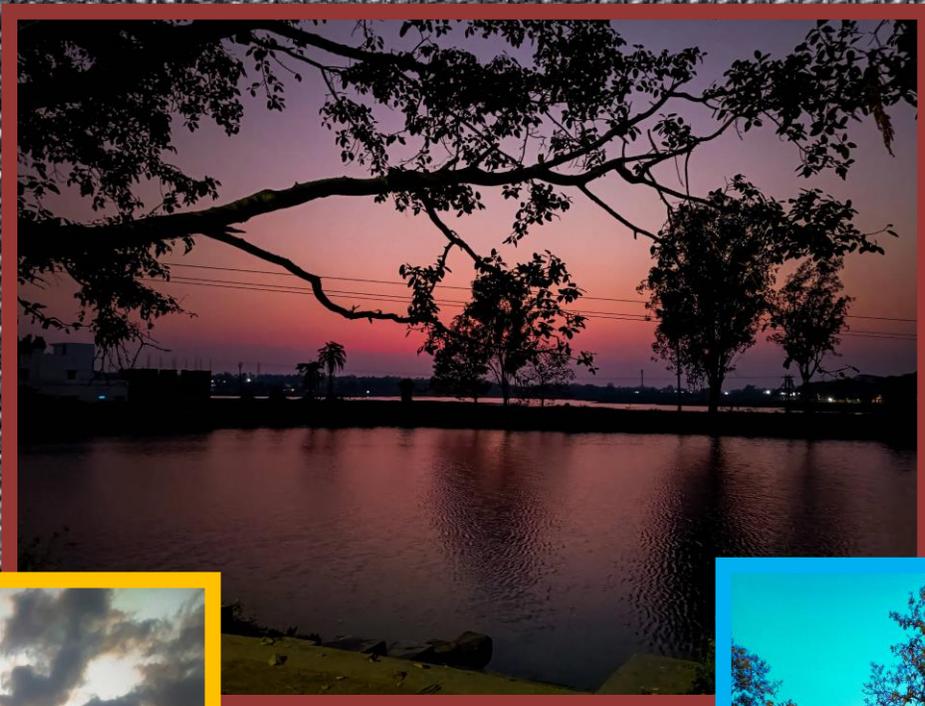
Ankita Kundu
3rd Year
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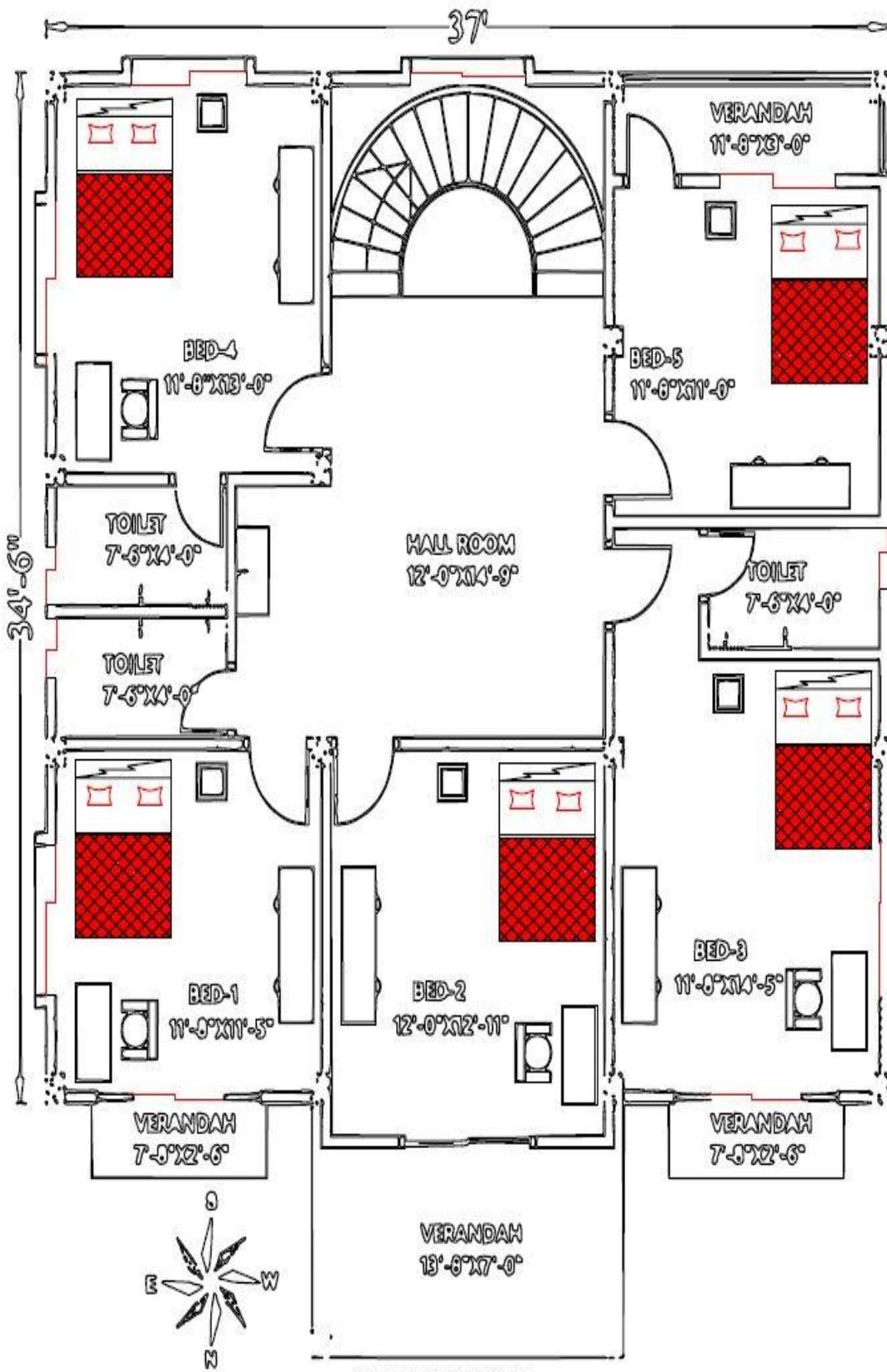
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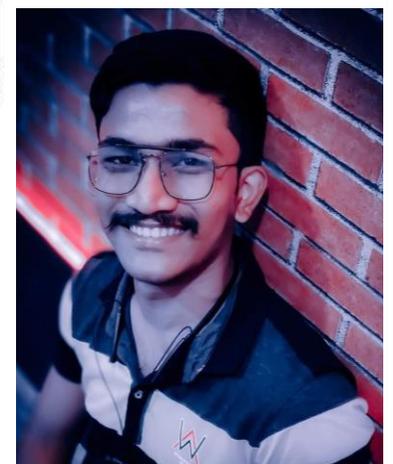
Neha Bhattacharjee
3rd Year
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Sneha Karmakar
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SUBIR GHOSH
4th Year, Civil Dept.
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E - Magazine

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!!!