Foundation

Eastern University
CIVIL
ENGINEERING

Annual Report 2024
Department of Civil Engineering

Editors
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January 2025

Eastern University

Road 6, Block B, Ashulia Model Town
Birulia, Savar, Dhaka -1345

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Professor Dr. Shahid Akhtar Hossain
Vice Chancellor

MESSAGE

It is with immense pride that I share this message for the 2nd Annual Report of the Civil Engineering Department. The accomplishments of this department over the past year are a testament to the unwavering dedication, academic rigor, and innovative spirit that define our institution.

Civil engineering is a cornerstone of development, shaping the infrastructure that supports our communities and economies. I am delighted to see the department excel in fostering a culture of excellence, from producing cutting-edge research to preparing students to become future leaders in the field. The strides made in sustainability, disaster resilience, and advanced construction technologies reflect a forward-thinking approach that aligns with global needs.

I commend the faculty, students, and staff for their collective efforts in achieving these milestones. Your commitment not only enhances the reputation of the department but also reinforces the university's mission to contribute meaningfully to society.

Together, let us continue to pursue excellence and innovation, creating a lasting impact on the engineering world and beyond.

Professor Dr. Md. Mahfuzur Rahman
Dean
Faculty of Engineering and Technology

MESSAGE

It is a privilege to present this message for the 2nd Annual Report of our esteemed Civil Engineering Department. Over the past year, our department has demonstrated remarkable growth, innovation, and resilience, solidifying its position as a hub of excellence in engineering education and research.

Our collective efforts have resulted in groundbreaking achievements, from pioneering research to impactful community projects. We take pride in our students, who continue to excel academically and professionally, embodying the values of leadership and creativity. Our faculty members have also made significant contributions to advancing knowledge, collaborating with industry and academia to address real-world challenges.

As we reflect on this year's accomplishments, we remain steadfast in our mission to nurture the next generation of engineers who will shape a sustainable and technologically advanced future. I thank our faculty, students, alumni, and industry partners for their dedication and support.

Let us continue to build on this success and reach greater heights together.

Professor Dr. SM Shirazi, CEng
Chairperson

MESSAGE

It is with great pride and enthusiasm that I extend my heartfelt greetings to all as we celebrate the 2nd Annual Report of our Civil Engineering Department. Over the past year, we have continued to uphold our commitment to excellence in education, research, and community service. This report is a testament to the hard work, dedication, and collaboration of our faculty, students, and staff.

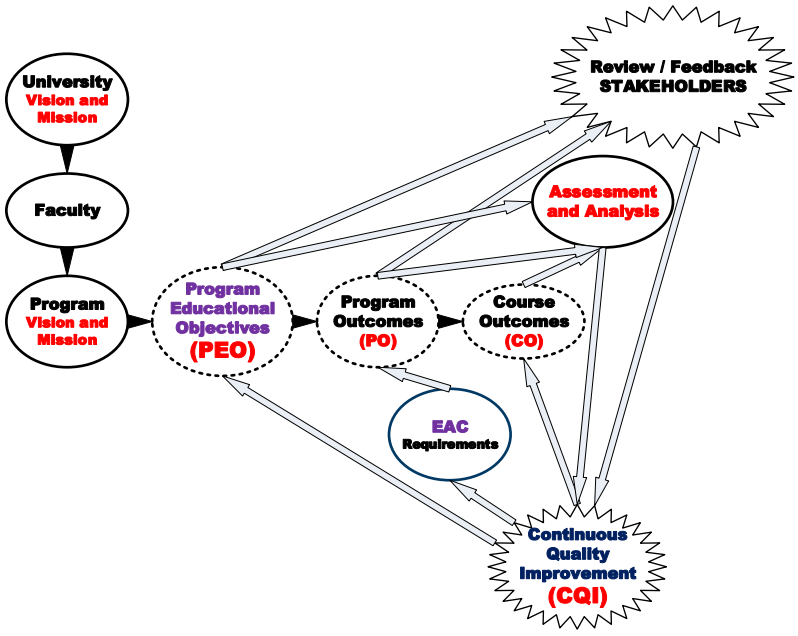
In this dynamic and evolving field, our department has achieved significant milestones, including innovative research projects and industry partnerships. We have also prioritized sustainability and resilience in our curriculum, ensuring our students are equipped to tackle the challenges of tomorrow.

I extend my sincere gratitude to our stakeholders and industry leaders, for their unwavering support. Let us continue to strive for innovation and excellence as we build a future that reflects the core values of our discipline.

Thank you for being part of our journey. Together, we will construct a better tomorrow.

1. Mission and Vision

The Department of Civil Engineering offers a 4 years undergraduate Program of Bachelor of Science in Civil Engineering. To become a graduate in this field one has to complete 160 credit hours. It is utmost necessity to enhance the quality of higher education in Bangladesh for national and global context. Eastern University (EU) is one of the private universities trying to maintain quality education for creating the leader of the leaders since 2003. Department of Civil Engineering has projected itself as one of the vital departments of the faculty of engineering and technology. Experienced and learned teachers teach the courses based on Outcome Based Education (OBE) system. Eastern University is well equipped with necessary lab facilities for test, and research works. The academic programs of this University are continually being updated and improved to reflect the latest development in engineering education. The mission of Civil Engineering department is to become a department of quality and distinction enabling students to flourish academically, personally, and socially through obtaining soft skill by OBE system.



Flow chart of Continuous Quality Improvement

Vision:

- Graduates are competent, innovative and entrepreneurial in acquiring and applying knowledge towards solving Civil Engineering problems.
- Graduates possess leadership qualities, able to work, manage in diverse teams and serve the society in multi-disciplinary environment.
- Graduates demonstrate professionalism and uphold ethical values with emphasis on sustainable development.
- Graduates are able to communicate effectively, possess strong self-confidence and recognize the need for life-long learning.

2. Faculty Members and Officials

Professor


Dr. SM Shirazi, CEng


Dr. Zakia Begum


Dr. Sharmin Islam


Dr. Amena Ferdousi


Dr. Gulshan Khatun

Associate Professor


Md. Abdur Rob


Dr. Iqbal Mahmud

Assistant Professor


Mohammad Ibna Anwar


Farzana Mahbub


Sonika Islam

Lecturer


Md. Mahmud


Abdullah-Al-Fahad


Md. Rajaur Rahman


Nafisa Huq

Lab Assistant


Khandaker Ahad

3. Research Activities

Development of Environmental Flow Framework for Flora and Fauna at Turag River Basin in Dhaka

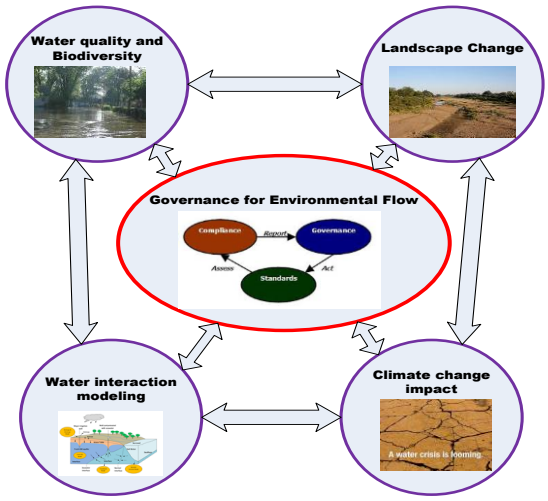
Prof. Dr. SM Shirazi, CEng
Chairperson
Department of Civil Engineering
Eastern University

Water crises may have two main reasons; one belongs to management and other predominately attached to the resource itself. The climate change effects on human beings and on terrestrial ecosystems will further aggravate water crisis in future. The shortage of water resource is not yet the main issue behind temporary water shortage in some regions in Dhaka, but the fragmental way of water resource management in the country has caused temporary water shortages in some regions. An integrated resource management strategy should be developed to avert any water shortages in Bangladesh. The concept of integrated water resources management (IWRM) has been surfaced for last more than one decade but its application in managing water resources in Bangladesh still lacks methodology support that can translate IWRM concept into practice. The present study plan to link environmental flow (including ecological flow, maintenance flow, conditioning flow, compensation flow, and minimum river flow) to the catchment developments (including human activities and nature impacts). The proposed methodology will consider environmental flow for requirement of water by whole ecosystem, aquatic life, and human being which are closely dependent on water availability in a watershed. Turag River Basin will use as a case study to build, run, and implement the environmental flow model.

Objectives

The overall objective of the study is to develop a framework for determining environmental flow for Turag River Basin in Dhaka. The framework will be based on a scientific grouping of ecological, hydrological, and environmental baseline data. The scientific grouping of the above factors will include an assessment of changes resulting from anthropogenic effects which occurred in the basin. The specific objectives of the study include:

1. To assemble and synthesize the information which is necessary for enabling stakeholders and river basin managers to develop environmental flow recommendations for the basin.
2. To develop an inclusive database for monitoring environmental flow and to evaluate the environmental flow guidelines.



Conceptual diagram of Environmental Flow process

Development of an urban sprawl Model for Dhaka City by using an Artificial Neural Network with CA-Markov Chain

Mohammaad Ibna Anwar
Assistant Professor
Department of Civil Engineering
Eastern University

Urbanization is an intricate socio-economic progression that transforms rural into urban settlements by shifting the spatial distribution of a population from rural to urban areas. A foremost outcome of urbanization is an increase in population size and land area of urban settlements as well as the proportion of urban inhabitants compared to rural residents. Spatial and urban planning and financial investments in infrastructure shape the urbanization process. As an increasing share of economic activity, a city gradually turns into a hub for the flow of transport, trade, and commerce.

The Markov chain (MC) model is developed based on a stochastic approach which has been extensively used in urban growth modeling which is adopted for the present study. Depending on the transition matrices, this method assesses the temporal change in land-use type. In the CA-MC combined model, a spatial filter of the CA model assesses the spatial changes, while MC part detects the temporal changes in land-use. Although the CA-MC model has the potential of spatial and temporal changes detection, for the realistic simulation, socio-economic and environmental factors need to be taken into account. In addition to that it simulates the changes in linear propagation method. Therefore to get a better understanding of growth pattern changes as well as to improve the prediction capability of model, the CA-MC model may need to be combined with other models such as Artificial Neural Network (ANN), one of the most powerful models that is subjected to artificial intelligence. ANN has the ability to develop a non-linear relationship between factors. Also, it deals more effectively with complex patterns like urban growth and land-use changes. Furthermore, it has the ability to deal with missing or fuzzy data.

Objectives

Due to rapid unplanned urbanization, Dhaka city is unable to cope with challenges like sanitation and drainage, solid waste management, degradation of soil and land, uncontrolled emissions from domestic and industrial activities, road traffic congestions and improper disposal of hazardous waste resulting in poor health of people because of the limitation of resources and management. Understanding the key trends of urbanization is crucial to making the city safe, resilient and sustainable for human settlements. The objectives of the present study are given below

1. Develop an urban sprawl model for Dhaka city by ANN with Cellular Automata-Markov Chain.
2. To identify the factors which affect the urban growth of the study area
3. To validate the accuracy of the model
4. To simulate the future land –use map of Dhaka city.

Superparamagnetic Behaviour of MnZn Ferrite Nanoparticles

Md. Mahmud
Lecturer, Department of Civil Engineering
Eastern University

This paper delves into the intriguing realm of nanoscale magnetic materials by investigating the super paramagnetic behavior of MnZn ferrite nanoparticles. These nanoparticles have garnered significant attention due to their unique magnetic properties, which stem from their small size and high surface-to-volume ratio. The study begins with a comprehensive review of the existing literature on superparamagnetism. The obtained results reveal the Superparamagnetic nature of the MnZn ferrite nanoparticles, focusing on their response to external magnetic fields and their potential applications in various fields. The findings suggest that the nanoparticles' magnetic behavior transitions from superparamagnetic to blocked as the temperature decreases, leading to potential applications in data storage, biomedical imaging, and targeted drug delivery. The implications of these findings extend beyond the realm of fundamental research, opening doors for technological advancements. By understanding and harnessing the superparamagnetic behavior of MnZn ferrite nanoparticles, researchers can design novel devices with enhanced functionalities. However, challenges related to size distribution, stability, and surface modification need to be addressed to fully exploit the potential of these nanoparticles.

Objectives

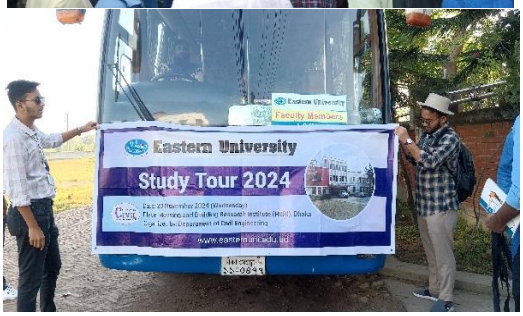
1. To analyze the different structural properties and comparative study of MnZn ferrite.
2. Analysing superparamagnetic characteristics of nanoparticles.
3. To find out the whether MnZn ferrite nanoparticles show superparamagnetism.
4. To understand the feasibility of future uses of MnZn nanoparticles.

4. Orientation Program

On September 15, 2024, the Department of Civil Engineering held a small celebration to welcome the freshmen students. The event was graced by the presence of Prof. Dr. Shahid Akhtar Hossain, Honorable Vice Chancellor of Eastern University, Prof. Md. Shamsul Huda, Treasurer of Eastern University, Dr. Abul Basher Khan, Registrar of Eastern University, Prof. Dr. Md. Mahfuzur Rahman, Dean of the Faculty of Engineering and Technology, and Prof. Dr. SM Shirazi, Chairperson of the Department of Civil Engineering, who shared their inspirational insights into the field of civil engineering.

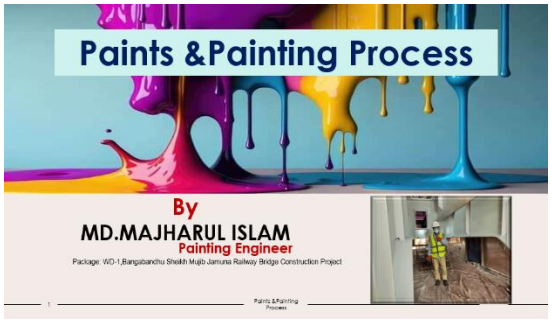
5. Study Tour 2024 at Housing and Building Research Institute (HBRI)

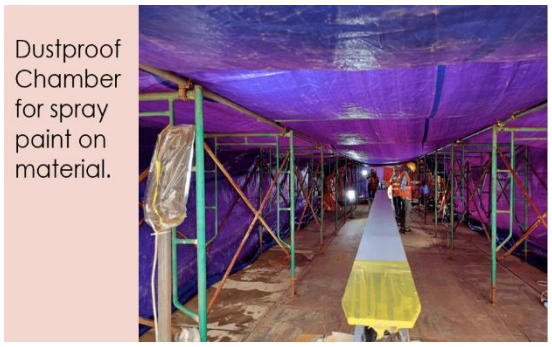
On November 20, 2024, the Department of Civil Engineering held a study tour at the Housing and Building Research Institute, Dhaka. The students of the Department of Civil Engineering wholeheartedly participated in the tour. It was a wonderful opportunity for learning about research works on Structural Engineering and Construction, Building Materials, Soil Mechanics and Foundation Engineering, Housing.



6. Seminar 2024 on "Paint and Painting Process of Steel Structures"

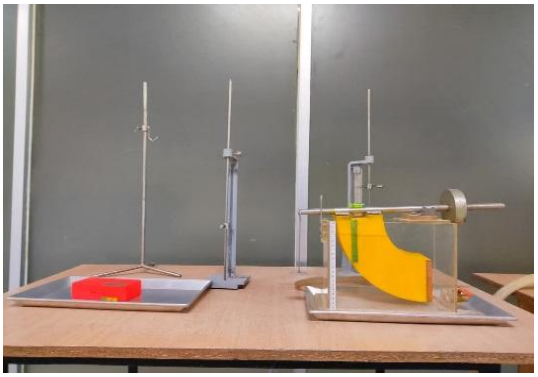
On November 23, 2024, the Department of Civil Engineering arranged a seminar on "Paint and Painting Process of Steel Structures." It was a great opportunity for students to learn about painting on steel structures from Md. Majharul Islam. Students' bright and eager eyes reflect the boundless potential of the future.





7. Laboratory Activities

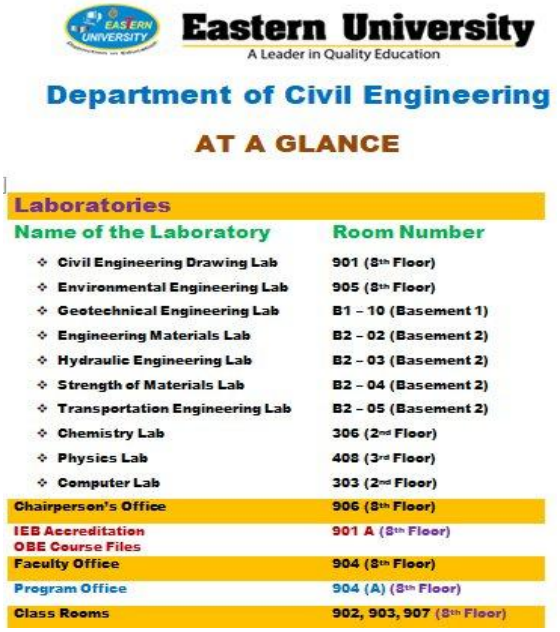
Just like every year, the students of the Department of Civil Engineering earned practical experience through laboratory work in our well-equipped strength of materials lab, and hydraulics laboratories.



8. Field Surveying

Students' performed their field survey course this year which gave them essential experience of real-life applications and hands-on experience.

9. Display Board



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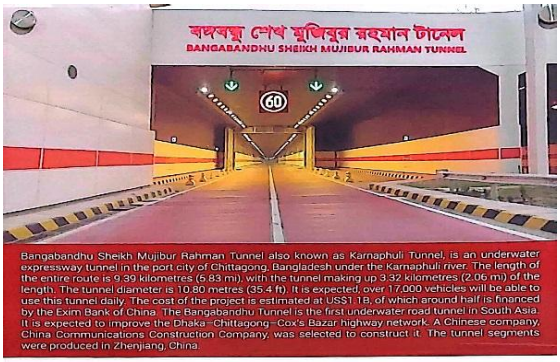
A Leader in Quality Education

Department of Civil Engineering

AT A GLANCE

Laboratories

Name of the Laboratory	Room Number
Civil Engineering Drawing Lab	901 (8th Floor)
Environmental Engineering Lab	905 (8th Floor)
Geotechnical Engineering Lab	B1 – 10 (Basement 1)
Engineering Materials Lab	B2 – 02 (Basement 2)
Hydraulic Engineering Lab	B2 – 03 (Basement 2)
Strength of Materials Lab	B2 – 04 (Basement 2)
Transportation Engineering Lab	B2 – 05 (Basement 2)
Chemistry Lab	306 (2nd Floor)
Physics Lab	408 (3rd Floor)
Computer Lab	303 (2nd Floor)
Chairperson's Office	906 (8th Floor)
IEB Accreditation OBE Course Files	901 A (8th Floor)
Faculty Office	904 (8th Floor)
Program Office	904 (A) (8th Floor)
Class Rooms	902, 903, 907 (8th Floor)



Bangabandhu Sheikh Mujibur Rahman Tunnel also known as Karnaphuli Tunnel, is an underwater expressway tunnel in the port city of Chittagong, Bangladesh under the Karnaphuli river. The length of the entire route is 9.39 kilometres (6.83 mi), with the tunnel making up 3.32 kilometres (2.06 mi) of the length. The tunnel diameter is 10.80 metres (35.4 ft). It is expected, over 17,000 vehicles will be able to use this tunnel daily. The cost of the project is estimated at US$1.18, of which around half is financed by the Exim Bank of China. The Bangabandhu Tunnel is the first underwater road tunnel in South Asia. It is expected to improve the Dhaka–Chittagong–Cox's Bazar highway network. A Chinese company, China Communications Construction Company, was selected to construct it. The tunnel segments were produced in Zhenjiang, China.

DESCRIPTION

The Saidabad-3 project aims at doubling the current site's production capacity by commissioning a new unit supplying 450,000 m3 per day, as well as installing a water intake and a pumping station on the Meghna River, 30 km from Dhaka, which will supply raw water to the three Saidabad units. A treated water pipeline will also be built and the primary distribution network strengthened, including in Dhaka's poor neighbourhoods.
As the Meghna River is one of the last options for supplying Dhaka with surface water (due to the pollution of the rivers around the capital), the project will go hand-in-hand with an environmental management plan to preserve the river's water quality.
This highly ambitious project is one of the largest water treatment infrastructures in the world funded by European cooperation. AFD is the lead financial partner, in partnership with KfW and EIB.

Cost

The construction of the tunnel cost ৳10374 crore (US$970 million).In October 2016, during the visit of Chinese President Xi Jinping to Dhaka, the loan agreement for the construction of the Bangabandhu Tunnel was signed. According to the agreement, Exim Bank of China provided ৳5913 crore (US$550 million) as a 20-year loan at 2 percent interest rate. The rest of the funding was provided by the Bangladesh government.

Overview		Technical		Operation	
Other name(s)	Karnaphuli Tunnel	Design engineer	Chinese	Opened	October 28, 2023
Location	Chittagong, Bangladesh	Length	3.32 km (1.39 km excluding approach road)	Owner	Government of Bangladesh
Coordinates		No. of tubes	4	Traffic	17,000 per day
Status	Operational	Operating speed	Maximum 80 km/h	Toll	৳200-৳1,000
Waterway	Karnaphuli River	Width	10.8 m		
Route	2	Depth of tunnel below water level	15 to 31 m		
Start	South Pannya	Grade	A1		
End	Anwara Upazila				

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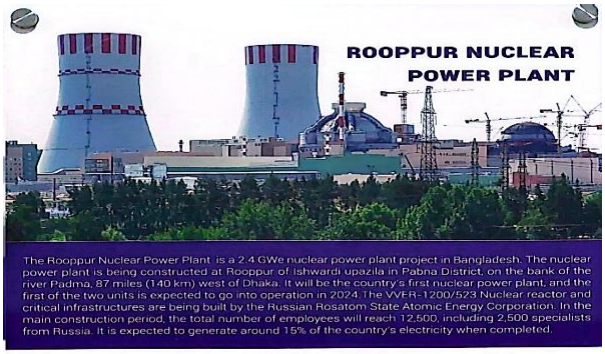

The Rooppur Nuclear Power Plant is a 2.4 GWe nuclear power plant project in Bangladesh. The nuclear power plant is being constructed at Rooppur of Ishwardi upazila in Pabna District, on the bank of the river Padma, 87 miles (140 km) west of Dhaka. It will be the country's first nuclear power plant, and the first of the two units is expected to go into operation in 2024. The VVER-1200/523 Nuclear reactor and critical infrastructures are being built by the Russian Rosatom State Atomic Energy Corporation. In the main construction period, the total number of employees will reach 12,500, including 2,500 specialists from Russia. It is expected to generate around 15% of the country's electricity when completed.

Construction

In 2016 ground preparation work commenced. The $12.65 billion contract is 90% funded by a loan from the Russian government. The two units generating 2.4 GWe are planned to be operational in 2024 and 2025. Rosatom will operate the units for the first year before handing over to Bangladeshi operators. Russia will supply the nuclear fuel and take back spent nuclear fuel.
On 4 November 2017, Bangladesh Atomic Energy Commission received, from Bangladesh Atomic Energy Regulatory Authority, the design and construction license of Unit 1, paving the way for the nuclear island first concrete pour.

Country	Bangladesh
Location	Rooppur, Ishwardi, Pabna Bangladesh
Status	Running
Commission date	2024
Construction cost	$12.65 billion
Owner(s)	Bangladesh Atomic Energy Commission
Operator(s)	Nuclear Power Plant Company Bangladesh Limited

Power generation	
Make and model	VVER-1200/523
Units under const.	2 × 1,200 MW (gross)
Nameplate capacity	2,160 MW

Nuclear power station	
Reactor type	PWR
Cooling towers	4 × Natural Draft
Cooling source	Padma River
Thermal capacity	2 × 3,200 MWt

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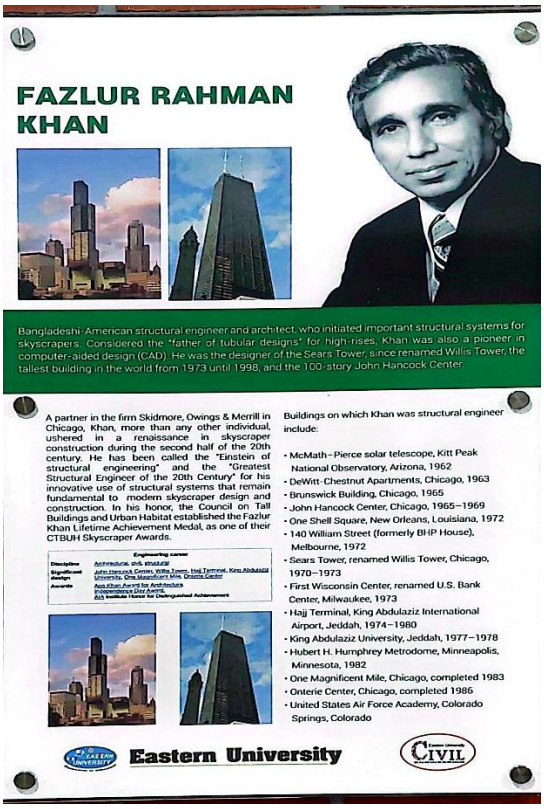
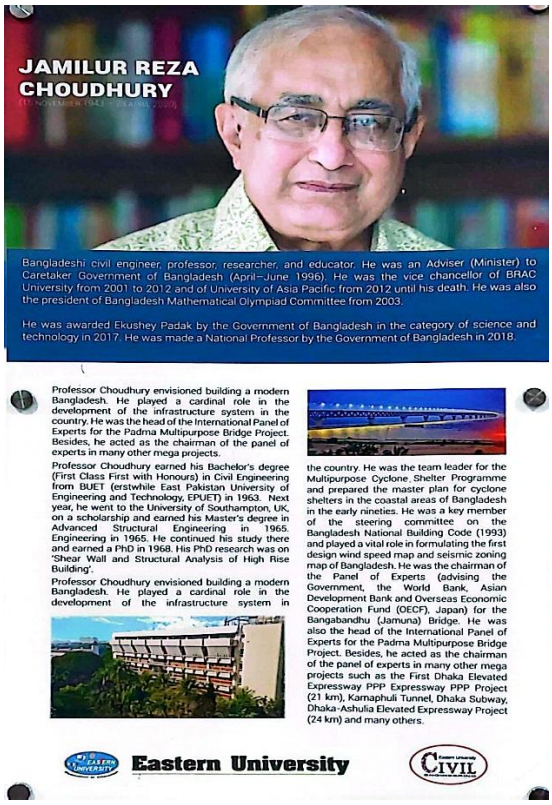

FAZLUR RAHMAN KHAN
Bangladeshi-American structural engineer and architect who initiated important structural systems for skyscrapers. Considered the "father of tubular designs" for high-rises, Khan was also a pioneer in computer-aided design (CAD). He was the designer of the Sears Tower, since renamed Willis Tower, the tallest building in the world from 1973 until 1998, and the 100-story John Hancock Center.
A partner in the firm Skidmore, Owings & Merrill in Chicago, Khan, more than any other individual, ushered in a renaissance in skyscraper construction during the second half of the 20th century. He has been called the "Einstein of structural engineering" and the "Greatest Structural Engineer of the 20th Century" for his innovative use of structural systems that remain fundamental to modern skyscraper design and construction. In his honor, the Council on Tall Buildings and Urban Habitat established the Fazlur Khan Lifetime Achievement Medal, as one of their CTBUH Skyscraper Awards.
Buildings on which Khan was structural engineer include:
• McMath–Pierce solar telescope, Kitt Peak National Observatory, Arizona, 1962
• DeWitt-Chestnut Apartments, Chicago, 1963
• Brunswick Building, Chicago, 1965
• John Hancock Center, Chicago, 1965–1969
• One Shell Square, New Orleans, Louisiana, 1972
• 140 William Street (formerly BHP House), Melbourne, 1972
• Sears Tower, renamed Willis Tower, Chicago, 1970–1973
• First Wisconsin Center, renamed U.S. Bank Center, Milwaukee, 1973
• Hajj Terminal, King Abdulaziz International Airport, Jeddah, 1974–1980
• King Abdulaziz University, Jeddah, 1977–1978
• Hubert H. Humphrey Metrodome, Minneapolis, Minnesota, 1982
• One Magnificent Mile, Chicago, completed 1983
• Onterie Center, Chicago, completed 1986
• United States Air Force Academy, Colorado Springs, Colorado
Eastern University


JAMILUR REZA CHOUDHURY
Bangladeshi civil engineer, professor, researcher, and educator. He was an Adviser (Minister) to Caretaker Government of Bangladesh (April–June 1996). He was the vice chancellor of BRAC University from 2001 to 2012 and of University of Asia Pacific from 2012 until his death. He was also the president of Bangladesh Mathematical Olympiad Committee from 2003.
He was awarded Ekushey Padak by the Government of Bangladesh in the category of science and technology in 2017. He was made a National Professor by the Government of Bangladesh in 2018.
Professor Choudhury envisioned building a modern Bangladesh. He played a cardinal role in the development of the infrastructure system in the country. He was the head of the International Panel of Experts for the Padma Multipurpose Bridge Project. Besides, he acted as the chairman of the panel of experts in many other mega projects.
Professor Choudhury earned his Bachelor's degree (First Class First with Honours) in Civil Engineering from BUET (erstwhile East Pakistan University of Engineering and Technology, EPUET) in 1963. Next year, he went to the University of Southampton, UK, on a scholarship and earned his Master's degree in Advanced Structural Engineering in 1965. Engineering in 1965. He continued his study there and earned a PhD in 1968. His PhD research was on 'Shear Wall and Structural Analysis of High Rise Building'.
Professor Choudhury envisioned building a modern Bangladesh. He played a cardinal role in the development of the infrastructure system in the country. He was the team leader for the Multipurpose Cyclone Shelter Programme and prepared the master plan for cyclone shelters in the coastal areas of Bangladesh in the early nineties. He was a key member of the steering committee on the Bangladesh National Building Code (1993) and played a vital role in formulating the first design wind speed map and seismic zoning map of Bangladesh. He was the chairman of the Panel of Experts (advising the Government, the World Bank, Asian Development Bank and Overseas Economic Cooperation Fund (OECF), Japan) for the Bangabandhu (Jamuna) Bridge. He was also the head of the International Panel of Experts for the Padma Multipurpose Bridge Project. Besides, he acted as the chairman of the panel of experts in many other mega projects such as the First Dhaka Elevated Expressway PPP Expressway PPP Project (21 km), Karnaphuli Tunnel, Dhaka Subway, Dhaka-Ashulia Elevated Expressway Project (24 km) and many others.
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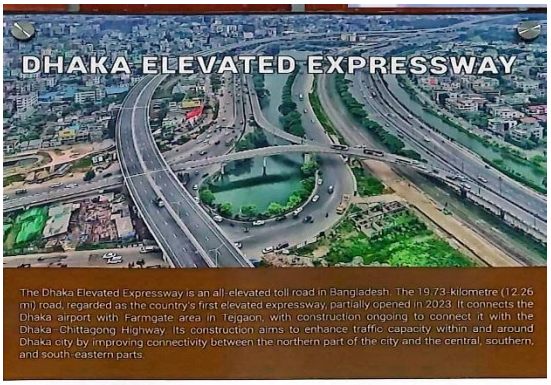
DHAKA ELEVATED EXPRESSWAY
The Dhaka Elevated Expressway is an all-elevated toll road in Bangladesh. The 19.73-kilometre (12.26 mi) road, regarded as the country's first elevated expressway, partially opened in 2023. It connects the Dhaka airport with Farmgate area in Tejgaon, with construction ongoing to connect it with the Dhaka–Chittagong Highway. Its construction aims to enhance traffic capacity within and around Dhaka city by improving connectivity between the northern part of the city and the central, southern, and south-eastern parts.
Route description
The four-lane Dhaka Elevated Expressway route begins near Hazrat Shahjalal International Airport at Kawla and runs alongside the railway line through Tejgaon, Maghbazar, Kamalapur, and ends at Kutubkhali near Jatrabari along the Dhaka–Chittagong Highway.
Once completed, the 19.73-kilometre (12.26 mi) expressway will feature ramps at 31 points, making its total length, including these ramps, 46.73 kilometres (29.04 mi). Additionally, there will be 11 toll plazas along the route.
As per the design specifications, the speed limit on the expressway is set at 80 kilometres per hour (50 mph). However, the government has temporarily enforced a speed limit of 60 kilometres per hour (37 mph) from Kaula to Tejgaon. The expressway is toll-operated and accessible to eight types of vehicles, including buses, minibuses, sedans, SUVs, specific trucks, and pickups. However, motorcycles, CNG-run auto-rickshaws, three-wheelers, bicycles, and pedestrians are not permitted on the expressway.
The Dhaka Elevated Expressway project commenced in 2011. On 15 December 2013, the Bangladesh Bridge Authority signed a revised agreement with the First Dhaka Elevated Expressway Company Limited, the investment company of the project.
This project is being implemented under the public–private partnership model, with the Thailand-based Italian-Thai Development holding 51 percent of the shares, China Shandong International Economic & Technical Cooperation Group holding 34 percent, and Sinohydro Corporation Limited holding 15 percent.
The total cost of the project, including main construction cost of the expressway, land acquisition, resettlement of the displaced, relocation of utility service lines, and consultation, amounts to ৳138.57 billion (US$1.3 billion).
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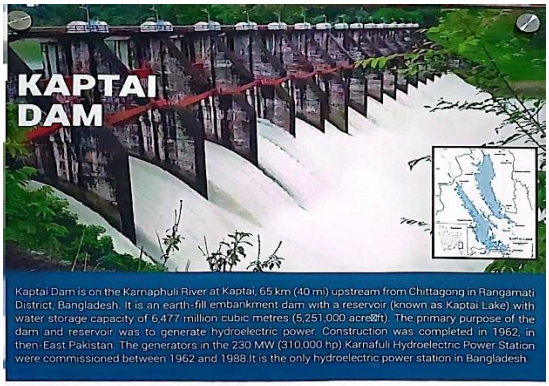
KAPTAI DAM
Kaptai Dam is on the Karnaphuli River at Kaptai, 65 km (40 mi) upstream from Chittagong in Rangamati District, Bangladesh. It is an earth-fill embankment dam with a reservoir (known as Kaptai Lake) with water storage capacity of 6,477 million cubic metres (5,251,000 acre⋅ft). The primary purpose of the dam and reservoir was to generate hydroelectric power. Construction was completed in 1962, in then-East Pakistan. The generators in the 230 MW (310,000 hp) Karnafuli Hydroelectric Power Station were commissioned between 1962 and 1988.It is the only hydroelectric power station in Bangladesh.
Location Kaptai, Rangamati District
Coordinates 22°29'42"N 92°13'30"E
Purpose Power
Status Operational
Construction began 1957
Opening date 1962
Dam and spillways
Type of dam Embankment
Impounds Karnaphuli River
Height 45.7 m (150 ft)
Length 670.6 m (2,200 ft)
Width (crest) 7.6 m (25 ft)
Width (base) 45.7 m (150 ft)
Dam volume 1,977,000 m³ (69,800,000 cu ft)
Spillway type Controlled, 16 gates
Spillway capacity 16,000 m³/s (570,000 cu ft/s)
Reservoir
Creates Kaptai Lake
Total capacity 6,477,000,000 m³ (5,251,000 acre⋅ft)
Catchment area 11,000 km² (4,200 sq mi)
Surface area 777 km² (300 sq mi)
Normal elevation 33 m (108 ft)
Power Station
Commission date 1962, 1982, 1988
Turbines 2 x 40 MW (54,000 hp), 3 x 50 MW (67,000 hp) Kaplan-type
Installed capacity 230 MW (310,000 hp)
Eastern University


BANGABANDHU BRIDGE
Bangabandhu Bridge, also known as the Jamuna Multi-purpose Bridge is a bridge opened in Bangladesh in June 1998. It connects Bhuapur on the Jamuna River's east bank to Sirajganj on its west bank. It was the 11th longest bridge in the world when constructed in 1998 and at present is the 6th longest bridge in South Asia. The Jamuna River, which it spans, is one of the three major rivers of Bangladesh, and is fifth largest in the world in discharge volume.
Sub-structure
The bridge is supported on tubular steel piles, driven into the river bed. Sand was removed from within the piles by airlifting and replaced with concrete. Out of the 50 piers, 21 piers are supported on groups of three piles (each of 2.5 m diameter) and 29 piers on groups of two piles (each of 3.15 diameter). The driving of 121 piles started on October 15, 1995, and was completed in July 1996. The pier stems are founded on concrete pilecaps, whose shells were precast and infilled with in-situ reinforced concrete. The reinforced concrete pier stems support pierheads which contain bearings and seismic devices. These allow movement of the deck under normal loading conditions but lock in the event of an earthquake to limit overall seismic loads through the structure and minimise damage.
Crosses Jamuna River
Locale Tangail and Sirajganj
Official name Bangabandhu Bridge
Other name(s)Jamuna Bridge
Maintained byBangladesh Bridge Authority
History
Designer T.Y. Lin International
Constructed by Hyundai Engineering & Construction
Opened June 1998
Characteristics
Design Box girder bridge
Material Prestressed concrete
Total length 4.98 km
Width 18.5 m
Longest span 99 m
Superstructure
The main bridge deck is a multi-span precast prestressed concrete segmental structure, constructed by the balanced cantilever method. Each cantilever has 12 segments (each 4 m long), joined to a pierhead unit (2 m long) at each pier and by an in-situ stitch at mid span. The deck is internally prestressed and of single box section. The depth of the box varies between 6.5 metres at the piers to 3.25 metres at mid-span. An expansion joint is provided every 7 spans by means of a hinge segment at approximately quarter span. The segments were precast and erected using a two-span erection gantry. The erection gantry was designed by Butterley Engineering Ltd. from Ripley, Derbyshire, UK and at 200m long was thought to be one of the largest in the world at that time.
Eastern University
CIVIL


DHAKA METRO RAIL
The Dhaka Metro Rail or simply the Dhaka Metro, is a mass rapid transit system serving Dhaka, the capital and largest city of Bangladesh. It is owned and operated by the Dhaka Mass Transit Company Limited (DMTCL). Together with the under construction Dhaka BRT, proposed Dhaka Subway and Dhaka suburban circular rail, it is expected to reduce traffic congestion in the city. The metro rail network has five planned lines which are the MRT Line 5, the only operational line, MRT Line 1 and MRT line 5, which are under construction, and MRT Line 2 and MRT Line 4, which are in the planning stages. It is part of the Strategic Transport Plan outlined by the Dhaka Transport Coordination Authority (DTCA).
Overview
Native name
Owner Road Transport and Highways Division
Locale Greater Dhaka, Bangladesh
Transit type Mass Rapid Transit
Number of lines 1 operational
3 under construction
2 planned
Operation
Began operation 29 December 2022
Operator(s) Dhaka Mass Transit Company Limited
Number of vehicles MRT 6: 12 pairs of trains (total 24 trains)
Train length 6 coaches
Technical
System length 20.1 km (12.5 mi)
Track gauge Standard gauge
Electrification 1500V DC via Overhead (Elevated)
750V DC via Third Rail (Underground)
Average speed 30 km/h (19 mph)
Top speed 100 km/h (62 mph)
Cost
Originally, the project cost was Tk 219,850 million but it was later increased by Tk 114,870 million to Tk 334,720 million, although the full Project is not yet completed. The first route, originally projected to start from Uttara, a northern area of Dhaka, to Sayedabad, in the south of the capital was eventually extended north to Uttara and truncated south to Motijheel. The original length which was 20.10 km (12.49 mi) has been increased by 1.16 km to 21.26 km (13.21 mi). It was planned to have 16 stations originally but it has been increased to 17 stations.
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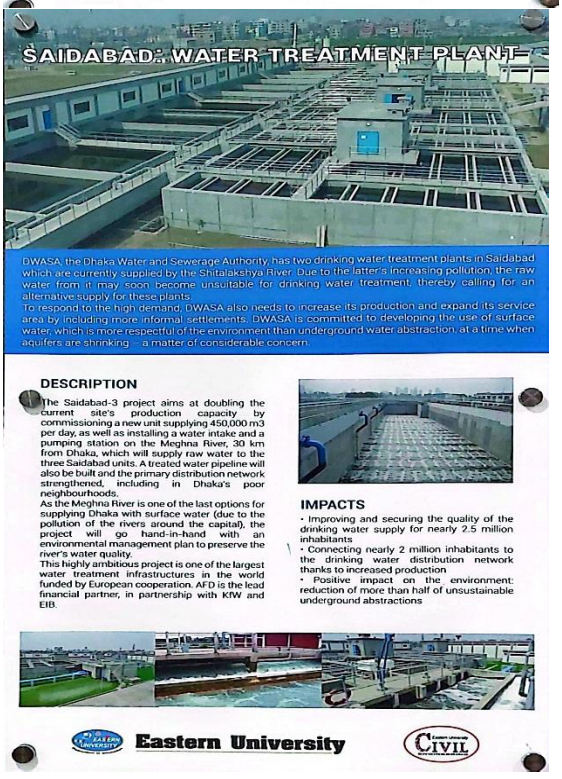
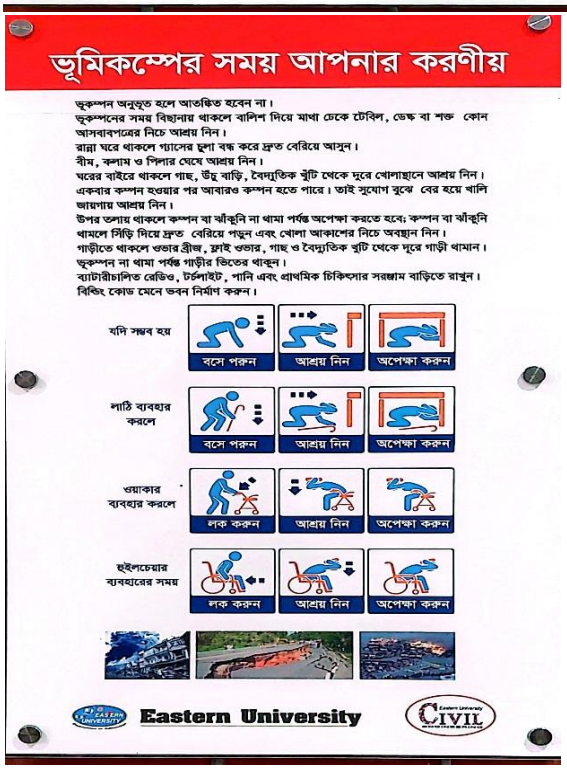
CIVIL


SAIDABAD WATER TREATMENT PLANT
DWASA, the Dhaka Water and Sewerage Authority, has two drinking water treatment plants in Saidabad which are currently supplied by the Shitalakshya River. Due to the latter's increasing pollution, the raw water from it may soon become unsuitable for drinking water treatment, thereby calling for an alternative supply for these plants.
To respond to the high demand, DWASA also needs to increase its production and expand its service area by including more informal settlements. DWASA is committed to developing the use of surface water, which is more respectful of the environment than underground water abstraction, at a time when aquifers are shrinking – a matter of considerable concern.
DESCRIPTION
The Saidabad-3 project aims at doubling the current site's production capacity by commissioning a new unit supplying 450,000 m3 per day, as well as installing a water intake and a pumping station on the Meghna River, 30 km from Dhaka, which will supply raw water to the three Saidabad units. A treated water pipeline will also be built and the primary distribution network strengthened, including in Dhaka's poor neighbourhoods.
As the Meghna River is one of the last options for supplying Dhaka with surface water (due to the pollution of the rivers around the capital), the project will go hand-in-hand with an environmental management plan to preserve the river's water quality.
This highly ambitious project is one of the largest water treatment infrastructures in the world funded by European cooperation. AFD is the lead financial partner, in partnership with KfW and EIB.
IMPACTS
• Improving and securing the quality of the drinking water supply for nearly 2.5 million inhabitants
• Connecting nearly 2 million inhabitants to the drinking water distribution network thanks to increased production
• Positive impact on the environment: reduction of more than half of unsustainable underground abstractions
Eastern University
CIVIL

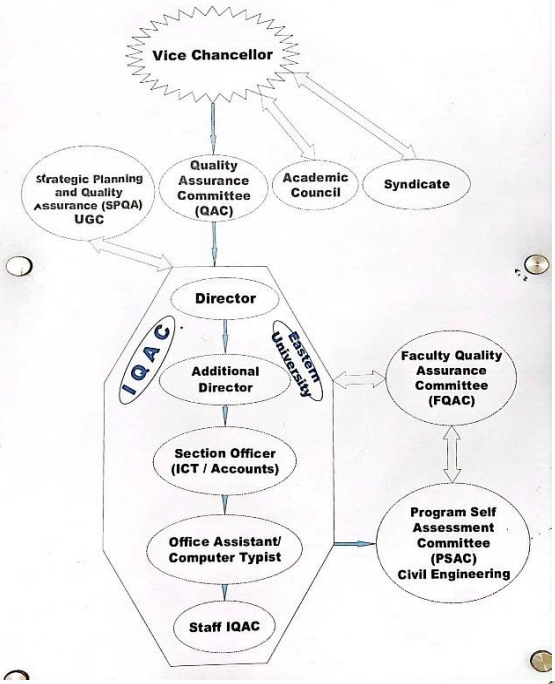

ভূমিকম্পের সময় আপনার করণীয়
ভূকম্পন অনুভূত হলে আতঙ্কিত হবেন না।
ভূকম্পনের সময় বিছানায় থাকলে বালিশ দিয়ে মাথা ঢেকে টেবিল, ডেস্ক বা শক্ত কোন আসবাবপত্রের নিচে আশ্রয় নিন।
রান্না ঘরে থাকলে গ্যাসের চুলা বন্ধ করে দ্রুত বেরিয়ে আসুন।
বীম, কলাম ও পিলার ঘেষে আশ্রয় নিন।
ঘরের বাইরে থাকলে গাছ, উঁচু বাড়ি, বৈদ্যুতিক খুঁটি থেকে দূরে খোলাস্থানে আশ্রয় নিন।
একবার কম্পন হওয়ার পর আবারও কম্পন হতে পারে। তাই সুযোগ বুঝে বের হয়ে খালি জায়গায় আশ্রয় নিন।
উপর তলায় থাকলে কম্পন বা ঝাঁকুনি না থামা পর্যন্ত অপেক্ষা করতে হবে; কম্পন বা ঝাঁকুনি থামলে সিঁড়ি দিয়ে দ্রুত বেরিয়ে পড়ুন এবং খোলা আকাশের নিচে অবস্থান নিন।
গাড়ীতে থাকলে ওভার ব্রীজ, ফ্লাই ওভার, গাছ ও বৈদ্যুতিক খুটি থেকে দূরে গাড়ী থামান।
ভূকম্পন না থামা পর্যন্ত গাড়ীর ভিতর থাকুন।
ব্যাটারীচালিত রেডিও, টর্চলাইট, পানি এবং প্রাথমিক চিকিৎসার সরঞ্জাম বাড়িতে রাখুন।
বিল্ডিং কোড মেনে ভবন নির্মাণ করুন।
যদি সম্ভব হয়
বসে পরুন
আশ্রয় নিন
অপেক্ষা করুন
লাঠি ব্যবহার করলে
বসে পরুন
আশ্রয় নিন
অপেক্ষা করুন
ওয়াকার ব্যবহার করলে
লক করুন
আশ্রয় নিন
অপেক্ষা করুন
হুইলচেয়ার ব্যবহারের সময়
লক করুন
আশ্রয় নিন
অপেক্ষা করুন
Eastern University
CIVIL

Department of Civil Engineering

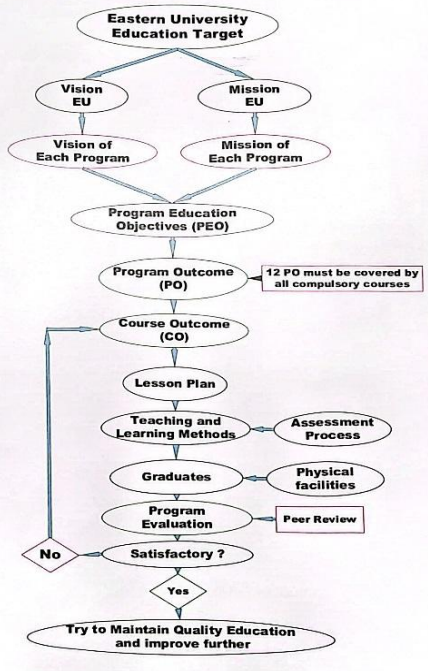
Guidelines: Civil Engineering Lab

- Know the location of exits, telephones, fire extinguishers, safety showers and eye washes for use (either your own use or to assist someone else) in case of emergency.
- Always wear shoes in the laboratory. DO NOT WEAR SANDALS or perforated shoes.
- Safety glasses or goggles must be worn at all times in the laboratories which require them.
- Wear protective lab coats.
- Always wear long pants. DO NOT WEAR SHORTS in the laboratories.
- Do not store open and/or unlabeled chemicals or solutions at any time.
- All waste chemicals and broken glass must be disposed of in approved containers. Put broken glass or other sharps only in a sharps container.
- DO NOT work alone in the laboratory if you are working with hazardous materials.
- DO NOT drink water from any sources other than drinking fountains or kitchens.
- Report all chemical spills immediately to lab contact person and clean up following established procedures.
- Don't taste or sniff chemicals.
- Don't experiment on yourself.

Dept. of Civil Engineering in IQAC



Department of Civil Engineering



Department of Civil Engineering

Program Outcomes (PO) for the B. Sc. in Civil Engineering

PO 1	Engineering Knowledge	Apply knowledge of mathematics, natural science, and engineering fundamentals.
PO 2	Problem analysis	Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO 3	Design/ development of solutions	Design solutions for complex engineering problems taking in to consideration to safety, health and welfare of the public and environment.
PO 4	Investigation	Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
PO 5	Modern tool usage	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.
PO 6	The engineering and society	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.
PO 7	Environment and sustainability	Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.
PO 8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 9	Individual work and teamwork	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
PO 10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project planning and finance	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

EASTERN UNIVERSITY
Distinction in Education

Department of Civil Engineering

Program Outcomes (PO) for the B. Sc. in Civil Engineering

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EASTERN UNIVERSITY
Distinction in Education

Department of Civil Engineering

Vision

Vision of Eastern University
The vision of Eastern University is to be a globally recognized university in its chosen fields of higher education and research in terms of quality.

Vision of Civil Engineering Department
To be a globally renowned Civil Engineering department for producing leader of the leaders through quality education.

Mission

Mission of Eastern University
The mission of the University is to equip the students with knowledge and skills essential for leadership in the private and public sector in the increasingly competitive and globalized environment.

Mission of Civil Engineering Department
To advance civil engineering knowledge and learning through essential soft skills for leadership at globally private and public sector.

Program Educational Objectives (PEO)

PEO 1 : Graduates are competent, innovative and entrepreneurial in acquiring and applying knowledge towards solving Civil Engineering problems.

PEO 2 : Graduates possess leadership qualities, able to work, manage in diverse teams and serve the society in a multi-disciplinary environment.

PEO 3 : Graduates demonstrate professionalism and uphold ethical values with emphasis on sustainable development.

PEO 4 : Graduates are able to communicate effectively, possess strong self-confidence and recognize the need for life-long learning.

Eastern University

Message from the Chairperson

Prof. Dr. SM Shirazi, CEng
FIEB, MASCE, MIWA, FJSPS

MESSAGE

As the Chairperson of the Civil Engineering Department, I am delighted to share with you the remarkable achievements and advancements within our department. Civil engineering stands as the cornerstone of societal development, and our principles are deeply intertwined with the betterment of human civilization. At our department, we instill in our students not only technical expertise but also a profound sense of responsibility towards society and the environment. Over the years, our faculty members have been at the forefront of cutting-edge research, exploring innovative solutions to pressing global challenges. I am immensely proud of our students, who have shown exceptional dedication and ingenuity in their academic pursuits and extracurricular activities. Their passion for learning and commitment to excellence testify to civil engineering's bright future. I welcome you all to our beautiful department. Together, we will continue to inspire and innovate, shaping a world that is safer, more sustainable, and more resilient for generations to come.

Department of Civil Engineering

Laboratory and Class Activities of Civil Engineering Department


Engineering Drawing Class


Faculty Members with Freshers


Fluid Mechanics Lab


Hydraulic Engineering Lab


Strengths of Materials Lab


Field Surveying

Student's View of Civil Engineering Department


July Akhter Srabony
President, EUCEC

My sophomore year in civil engineering has been dynamic, exploring structural design, environmental principles, and transportation systems. The reality of the challenges ahead is sinking in, but I'm determined to overcome them and emerge stronger


Sazzad Hossain Pritom
Organizing Secretary, EUCEC

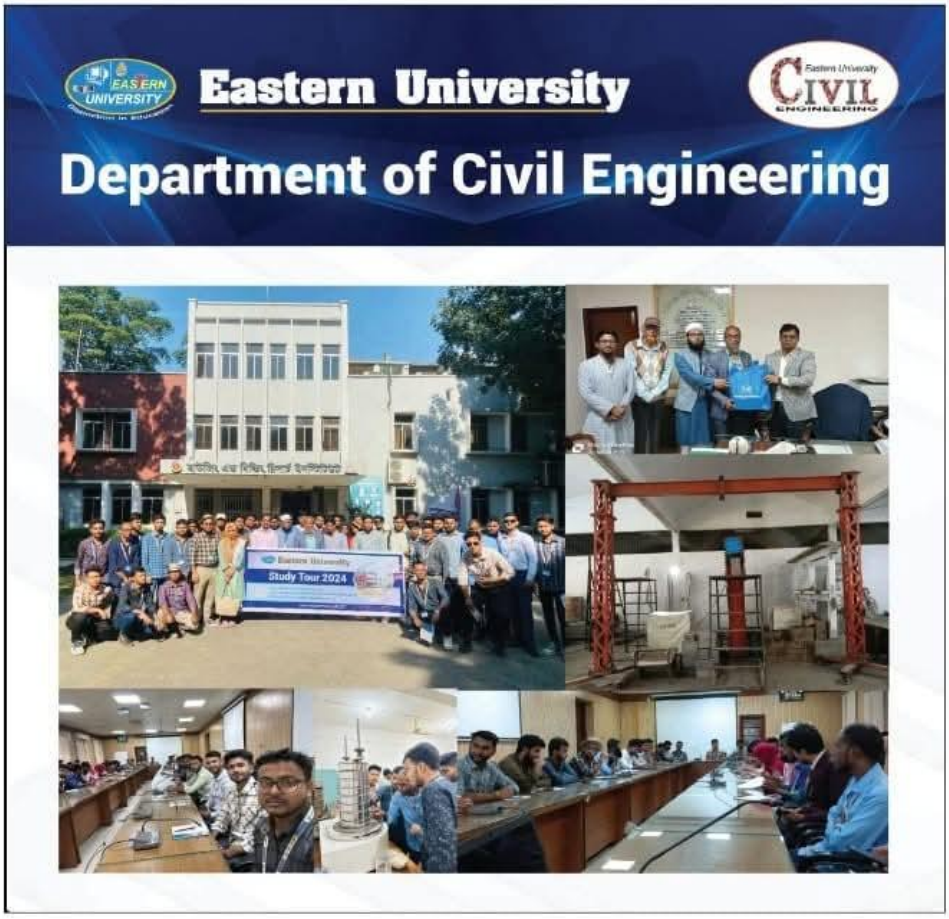
As a first year student of Civil Engineering Department of Eastern University, I am really grateful to our academic staff and university authority. I am inspired from my teachers and seniors and I confidently believe to achieve my dream as a professional Civil Engineer

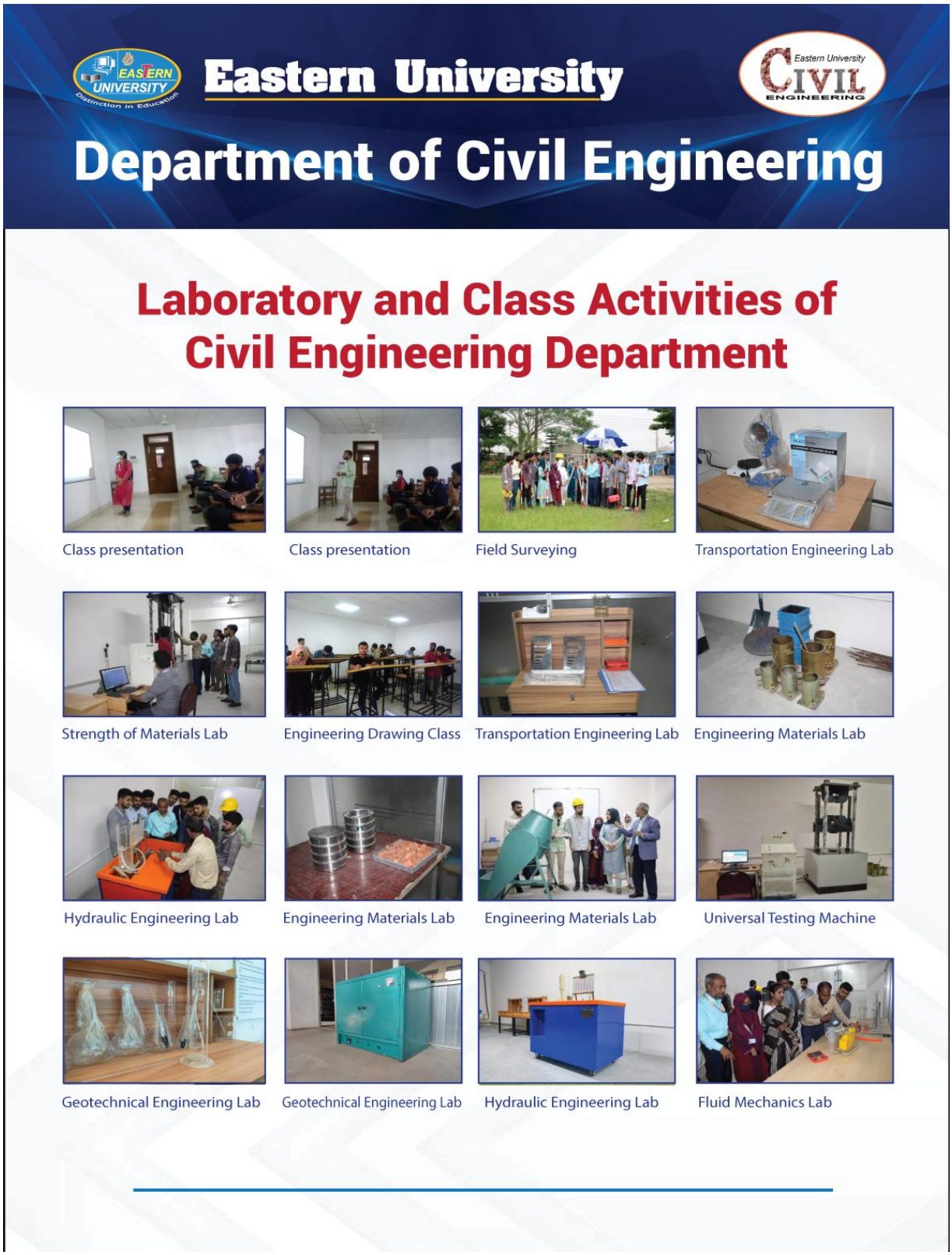

Md. Abdullah Al Foyaz
Member, EUCEC

Just stepped into the Civil Engineering Department and the excitement are buzzing in the air as I embark on this journey to understand the world of structures and constructions. Can't wait to dive into the subjects and learn the ropes of Civil Engineering!

Eastern University Civil Engineering Club


Eastern University
Department of Civil Engineering
Seminar 2024: Paint and Painting Process of Steel Structures


Eastern University
Department of Civil Engineering
Study Tour 2024



Laboratory and Class Activities of Civil Engineering Department

Eastern University

Department of Civil Engineering

Board of Accreditation for Engineering and Technical Education (BAETE)

The Institution of Engineers, Bangladesh (IEB)

Eligibility for Accreditation

- Program approved by UGC
- A duration of four years after twelve years of schooling
- At least one cohort has graduated from the program
- Program pedagogy follows outcome-based education (OBE) system.
- Requires a minimum of 130 total credit hours (Definition of semester each credit hours – Lecture Classes: a minimum of 750 minutes of formalized classroom instruction in a semester; Laboratory Classes: a minimum of 1500 minutes laboratory contract hours in a semester).

IEB Accreditation Criteria

- Organization and Governance
- Financial and Physical Resources
- Faculty
- Students
- Academic Facilities and Technical Support
- Curriculum and Teaching – Learning Process
- Program Educational Objectives (PEO)
- Program Outcomes (PO) and Assessment
- Continuous Quality Improvement
- Interactions with the Industry

IEB Accreditation Criteria

Eastern University Civil Engineering Club

EUCEC

An academic club is essential for conducting co- and extracurricular activities of the Civil Engineering department to achieve leadership in the civil engineering arena. Eastern University Civil Engineering Club (EUCEC) was founded on 1 January 2023.

Objectives

- To foster leadership, communication skills, and creativity conducive to effective entrepreneurial awareness.
- The vision of the Civil Engineering Club is to be a renowned Civil Engineering Club that produces leaders who can contribute to economic emancipation and sustainable development of the country.
- The mission of the Civil Engineering Club is "to advance engineering knowledge and learning through extra-curricular activities in the pursuit of the fulfilling aspiration of the University and the nation."

Activities

The regular arrangement of seminars, workshops, social activities, project competitions, and field visits related to Civil Engineering.

Committee

- Coordinator
- President
- Vice President
- General Secretary
- Treasurer
- Organizing Secretary
- Joint Secretary
- Membership Development Secretary
- Office Secretary
- Event Secretary
- Publication Secretary
- Publicity Secretary
- IT Secretary
- Executive Members

Eastern University

10. Faculty Members' Views

Mohammad Ibna Anwar
Assistant Professor

I am delighted to join the Department of Civil Engineering (CE) at Eastern University (EU) of Bangladesh. One of the most significant lessons that I learned is that a new journey will begin once a young student steps into university, which is, certainly, challenging, rewarding, and life-changing. During this journey, a young man will learn how to approach challenges with a logical and analytical mindset, breaking down complex problems into manageable parts and finding innovative solutions and adaptations to meet the evolving needs of the 21st century.

Md. Mahmud
Lecturer

It is both an honor and a privilege to be part of the esteemed Civil Engineering faculty at Eastern University. I commend the Civil Engineering department for its remarkable efforts in preparing the annual progress report, which effectively highlights the significant milestones and achievements of the past year. Let us seize the upcoming opportunities as a driving force to ignite creativity, and elevate our collective pursuit of excellence. Together, we can set the stage for a new era of progress in both teaching and research, advancing the field of Civil Engineering at Eastern University.

11. Students' Views

Md. Mahbubur Rahman Miraj
(ID: 232420003)

Lectures delivered by academic staff are truly transformative, bridging the gap between theoretical frameworks and practical applications in civil engineering. They not only deepen our understanding of complex concepts but also illuminate how classroom knowledge drives innovation in real-world projects.

Sazzad Hossain Pritom
(ID: 232420011)

Professors here transcend the role of mere teachers; they are true architects of inspiration, igniting curiosity and fostering a profound passion for civil engineering. Through their guidance, we explore the art and science of creating structures that not only stand the test of time but also redefine innovation, resilience, and excellence."

Soronika Rahman
(ID: 232420018)

Navigating the intensity of the workload is a real challenge. Balancing complex equations and mastering engineering mechanics is anything but easy. The weight of the challenges ahead is becoming clear, but with determination and resilience, I'm committed to overcoming them and growing stronger with each step.

Tajim Ahamed Emon
(ID: 232420010)

The emphasis on sustainable and eco-friendly practices in civil engineering is truly inspiring. It's not just about constructing structures—it's about building responsibly with the future in mind. Exploring green technologies and their seamless integration into modern infrastructure is reshaping my perspective, encouraging a deeper commitment to creating a more sustainable world.

Md Abdullah Al Foyaz
(ID: 241420007)

The dream of becoming a civil engineer is coming to life as the first semester unfolds. While the challenges are significant, so too is the boundless potential to create structures that are both meaningful and enduring. Thrilled to embark on this exciting journey of building dreams and shaping the future!

Md Hasan Niloy
(ID: 241420023)

I've joined study groups with some amazing classmates, and the camaraderie is truly inspiring. Working together on assignments and projects not only lightens the workload but also strengthens our bond. There's a profound sense of unity as we navigate the challenges of civil engineering, supporting one another every step of the way.

Md. Sadman Rahman Sahib Khan
(ID: 242420001)

Had my first lab session today in Civil Engineering Drawing. It was an incredible, hands-on experience! It’s fascinating to see how civil engineering goes beyond textbooks, blending technical knowledge with creativity and experimentation. The practical aspect makes it both challenging and exhilarating!

Tawkir Uddin
(ID:242420005)

As a first-year student in the Civil Engineering Department of Eastern University, I am deeply grateful to our dedicated academic staff and the university authorities. Their guidance and encouragement inspire me every day, strengthening my confidence in achieving my dream of becoming a professional civil engineer.

12. Year / Level / Semester / Term Wise Distribution of Courses

Sl No.	Course Code	Courses Title	Credits	Contact Hours / Week		Pre Requisite Course
		Year 1, Term 1 (1st Semester)		**Theory**	**Lab/Sessional**	
1	07321101	Civil Engineering Drawing I	1		3	
2	07321102	Engineering Mechanics	3	3		
3	07321103	Engineering Geology	3	3		
4	05331101	Physics I	3	3		
5	05331102	Physics I Lab	1		3	
6	05411101	Calculus I	3	3		
7	02321101	Bangla Language and Literature	3	3		
		Total	**17**	**15**	**6**	
		1st Semester Total Contact Hours	**(15+6) x 14 = 294**			
			Credits	**Contact Hours / Week**		
		Year 1, Term 2 (2nd Semester)		**Theory**	**Lab/Sessional**	
8	07321201	Surveying	3	3		
9	06131203	Computer Programming	3	3		
10	06131204	Computer Programming Lab	1		3	
11	05331203	Physics II	3	3		05331101
12	07131203	Electrical Circuit	3	3		
13	07131204	Electrical Circuit Lab	1		3	
14	05411203	Calculus II	3	3		
15	02221205	Emergence of Bangladesh and History	3	3		
		Total	**20**	**18**	**6**	
		2nd Semester Total Contact Hours	**(18+6) x 14 = 336**			
			Credits	**Contact Hours / Week**		
		Year 2, Term 1 (3rd Semester)		**Theory**	**Lab/Sessional**	
16	0732 2101	Engineering Materials	3	3		
17	07322102	Engineering Materials Lab	1		3	
18	07322103	Mechanics of Solids I	3	3		07321102
19	07322104	Civil Engineering Drawing II	1		3	
20	07322105	Field Surveying	1		3	
21	07322106	Fluid Mechanics	3	3		
22	05412105	Differential Equations, Geometry and Complex Variables	3	3		
23	03142111	Introduction to Sociology	3	3		
24	02312109	Writing Skills	3	3		
		Total	**21**	**18**	**9**	
		3rd Semester Total Contact Hours	**(18+9) x 14 = 378**			
			Credits	**Contact Hours / Week**		
		Year 2, Term 2 (4th Semester)		**Theory**	**Lab/Sessional**	
25	07322201	Mechanics of Solids II	3	3		07322103
26	07322202	Determinate Structures	3	3		
27	07322203	Structural Mechanics and Materials Lab	1		3	
28	07322204	Fluid Mechanics Lab	1		3	
29	05312205	Chemistry	3	3		
30	05312206	Chemistry Lab	1		3	
31	05412207	Linear Algebra and Statistics	3	3		

32	07322208	Irrigation and Flood Control	3	3		
33	04112200	Fundamentals of Accounting	3	3		
		Total	**21**	**18**	**9**	
		4th Semester Total Contact Hours	**(18+9) x 14 = 378**			
			Credits	**Contact Hours / Week**		
		Year 3, Term 1 (5th Semester)		**Theory**	**Lab/Sessional**	
34	07323101	Reinforced Concrete Structures I	3	3		07322103
35	07323102	Water Supply Engineering	3	3		
36	07323103	Soil Mechanics	3	3		
37	07323104	Geotechnical Engineering Lab	1		3	
38	07323105	Quantity surveying	1		3	
39	07323106	Open Channel Flow	3	3		
40	07323107	Indeterminate Structures I	3	3		07322103
41	04133102	Fundamentals of Business	3	3		
		Total	**20**	**18**	**6**	
		5th Semester Total Contact Hours	**(18+9) x 14 = 378**			
			Credits	**Contact Hours / Week**		
		Year 3, Term 2 (6th Semester)		**Theory**	**Lab/Sessional**	
42	07323201	Reinforced Concrete Structures II	3	3		07323101
43	07323202	Foundation Engineering	3	3		07323103
44	07323203	Hydrology	3	3		
45	07323204	Determinate Structures Sessional	1		3	
46	07323205	Transport and Traffic Design	3	3		
47	07323206	Water Supply Engineering Lab	1		3	
48	07323207	Waste Water and Solid Waste Management	3	3		
49	07323208	Open Channel Flow Lab	1		3	
50	07323209	Engineering Ethics and Professional Practice	3	3		
		Total	**21**	**21**	**9**	
		6th Semester Total Contact Hours	**(18+9) x 14 = 378**			
			Credits	**Contact Hours / Week**		
		Year 4, Term 1 (7th Semester)		**Theory**	**Lab/Sessional**	
51	07324100	Thesis / Project	2		3	
52	07324101	Highway and Railway Engineering	3	3		
53	07324102	Indeterminate Structures II	3	3		07323107
54	03114101	Engineering Economics	3	3		
55	07324104	Transportation Engineering Lab	1		3	
56	07324105	Pre-stressed Concrete	3	3		
57	07324106	Project Planning and Management	3	3		
58	07324107	Steel Structures	3	3		
		Total	**21**	**18**	**6**	
		7th Semester Total Contact Hours	**(15+9) x 14 = 336**			
			Credits	**Contact Hours / Week**		
		Year 4, Term 2 (8th Semester)		**Theory**	**Lab/Sessional**	
59(1)	07324202	Steel Structures Sessional	3	3		Select One
59(2)	07324203	Structural Safety				
59(3)	07324204	Seismic Design of Structure				
60(1)	07324205	Environmental Pollution Control	3	3		Select One
60(2)	07324206	Climate Change and Disaster Management				
60(3)	07324207	Environmental Impact				

		Assessment and Sustainability				
61(1)	07324208	Laterally Loaded and Machine Foundations	3	3		Select One
61(2)	07324209	Soil Water Interaction				
61(3)	07324210	Earth Retaining Structures				
62(1)	07324211	Intelligent Transportation System	3	3		Select One
62(2)	07324212	Urban Transportation Planning and Management				
63(1)	07324213	Water Resources Engineering Sessional	3	3		Select One
63(2)	07324214	Ground water Engineering				
63(3)	07324215	River Engineering				
	07324100	Thesis / Project	4	4		
		Total	**19**	**19**		
		8th Semester Total Contact Hours	**20 x 14 = 280**			
		Total Semester Contact Hours	**2800**			
		Grand Total Credit Hours	**160**			

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