CIVIL-Q1-27/10/2022 JUL-DEC 2022

Dr. M.G.R
EDUCATIONAL AND RESEARCH INSTITUTE
(Deemed to be University with Special Autonomy Status)
Accredited by NAAC with 'A' Grade (CGPA 3.31 for 4 point scale)
An ISO Certified Institution

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENTOFCIVIL ENGINEERING

CIVIL CHRONICLE

VISION

To foster competent Civil engineers for the development of sustainable built environment

MISSION

M 1	Equip students in contemporary Civil Engineering domains
M 2	Impart practical training to meet the industrial requirements and to inculcate research competency
M 3	Provide adequate skills to become successful entrepreneurs

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO :1	Analyze Civil Engineering problems and design appropriate solutions as per standards
PEO :2	Practice as a Civil Engineer towards creating a sustainable society
PEO :3	Enhance quality of entrepreneurship through software, communication and managerial skills

PROGRAM OUTCOME (POs)

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1	Capacity to manage civil engineering projects with technical knowledge and professional skills	
PSO 2	Graduates will be able to work effectively as an individual or in a team with good leadership skills in multidisciplinary environments to meet sustainability goals	

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**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.

FROM THE HOD'S DESK

I am pleased to know that our Civil Engineering Department is once again successful in bringing Q2 issue of News letter **"CIVIL CHRONICLE"** for the year 2022.

A Technical Newsletter such as this is required for growth and progress of departmental activities, including publishing articles, papers, research activities etc. I am sure that this type of publishing technical newsletter will prove its mettle by providing an opportunity for bringing out the writing talent which bears immense potentiality of sharpening Students' communication skill as part of their overall personality development and also will direct their creativity to new dimensions of mature expression.

I congratulate all the contributors and the editorial board for bringing out such a News letter.

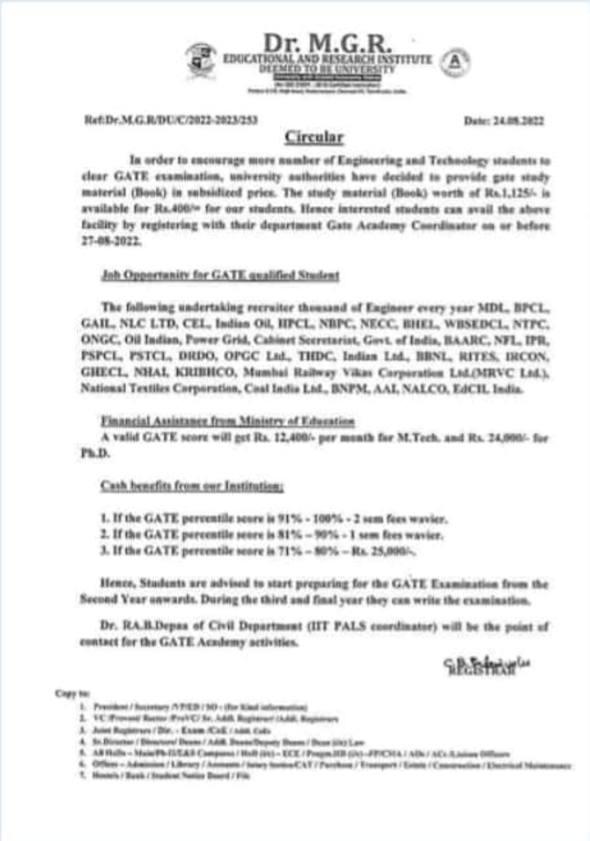
DR.T.KAVITHA

ACHIEVEMENT OF THE YEAR

Civil Engineering Department has been selected one of the best department among top ten private Engineering institutions in India during the year 2022. The award has been solemnized by **The Academic insights**, Bengaluru.

At this moment, on behalf of the department, we are happy to thank Our Honorable Chairman, Honorable President, Vice Chancellor, Pro-vost, Rector, Pro-vice chancellor and all Executives, Deans and our department faculty members and non teaching staff for their support to make this great achievement.

CAREER GUIDANCE FOR GATE



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DEEMED TO BE UNIVERSITY

Ref:Dr.M.G.R/DU/C/2022-2023/253 Date: 24.08.2022

Circular

In order to encourage more number of Engineering and Technology students to clear GATE examination, university authorities have decided to provide gate study material (Book) in subsidized price. The study material (Book) worth of Rs.1,125/- is available for Rs.400/= for our students. Hence interested students can avail the above facility by registering with their department Gate Academy Coordinator on or before 27-08-2022.

Job Opportunity for GATE qualified Student

The following undertaking recruiter thousand of Engineer every year MDL, BPCL, GAIL, NLC LTD, CEL, Indian Oil, HPCL, NBPC, NECC, BHEL, WBSEDCL, NTPC, ONGC, Oil Indian, Power Grid, Cabinet Secretariat, Govt. of India, BAARC, NFL, IPR, PSPCL, PSTCL, DRDO, OPGC Ltd., THDC, Indian Ltd., BBNL, RITES, IRCON, GHECL, NHAI, KRIBHCO, Mumbai Railway Vikas Corporation Ltd.(MRVC Ltd.), National Textiles Corporation, Coal India Ltd., BNPM, AAI, NALCO, EdCIL India.

Financial Assistance from Ministry of Education

A valid GATE score will get Rs. 12,400/- per month for M.Tech. and Rs. 24,000/- for Ph.D.

Cash benefits from our Institution:

1. If the GATE percentile score is 91% - 100% - 2 sem fees wavier.
2. If the GATE percentile score is 81% – 90% - 1 sem fees wavier.
3. If the GATE percentile score is 71% – 80% – Rs. 25,000/-.

Hence, Students are advised to start preparing for the GATE Examination from the Second Year onwards. During the third and final year they can write the examination.

Dr. RA.B.Depaa of Civil Department (IIT PALS coordinator) will be the point of contact for the GATE Academy activities.

REGISTRAR

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Career Guidance for cracking GATE Exam held on 26th August 2022 (2:00-3:30 PM).

Speaker: Mr. Pabba Ramesh, M.Tech, PhD, Sr. Faculty - ACE Engineering Academy.

Topics: GATE preparation steps, exam strategies, and Public Sector opportunities.

B.Tech Civil Engineering students actively participated.

EVENTS


GPS Map Camera
Chennai, Tamil Nadu, India
Dr.M.G.R. Educational and Research Institute (Smart Room),
Poonamallee High Rd, Sathiyamoorthy Nagar, Maduravoyal, Chennai,
Tamil Nadu 600107, India
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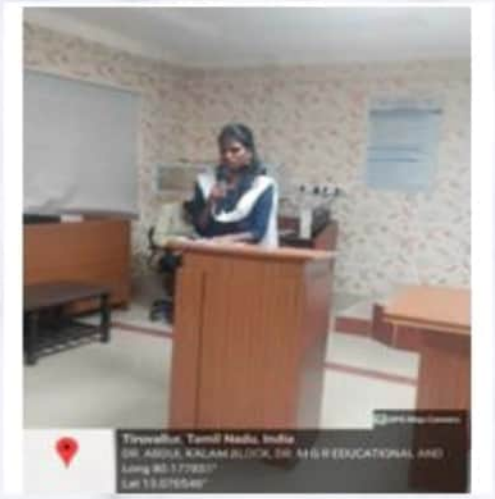


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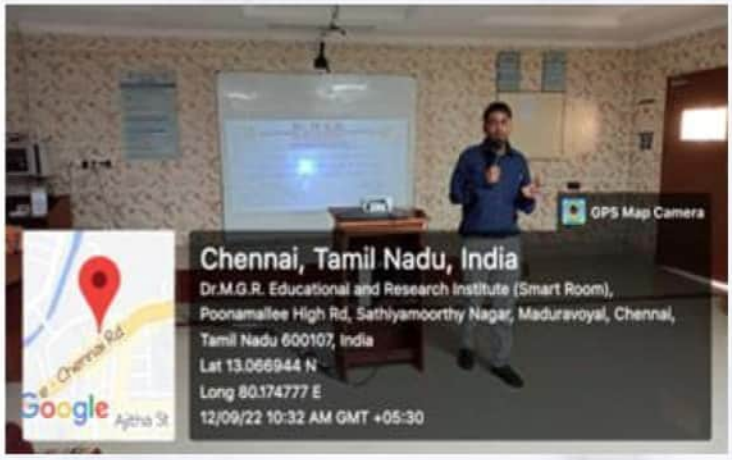
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Tamil Nadu 600107, India
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Long 80.174777 E
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Dr.M.G.R. Educational and Research Institute (Smart Room), Poonamallee High Rd, Sathiyamoorthy Nagar, Maduravoyal, Chennai, Tamil Nadu 600107, India
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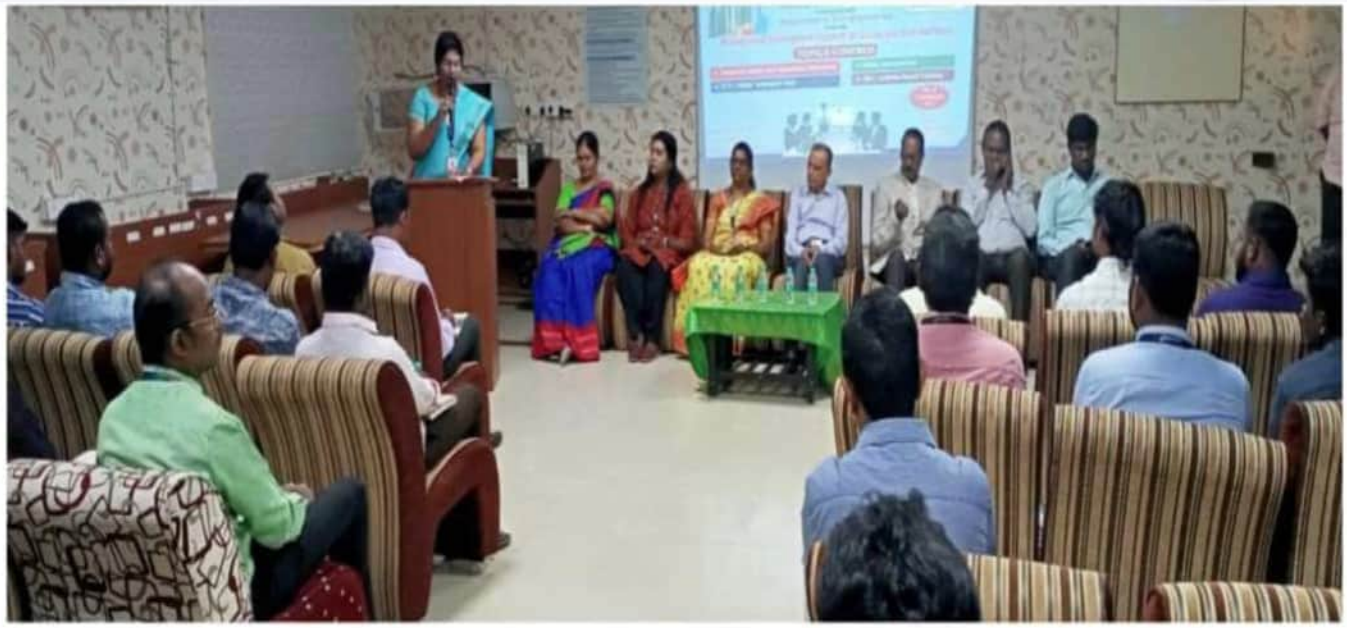
Chennai



FDP ON
WOMEN EMPOWERMENT 2.0

DAY 2.: FDP ON WOMEN EMPOWERMENT 2.0

FDP on Women Empowerment 2.0 was conducted by the Dept. of Civil Engineering.

Chief Guest: Vice Chancellor Dr. S. Geetha Lakshmi, who was felicitated with the "VEERAMANGAI" award.

Key Highlights: Professional life experiences, planning, time management, courage & health consciousness among women.

Other Speakers: Dr. Maline Pande (Addl. Registrar), Dr. T. Felix Kala (Joint Registrar), Dr. Suchitra (Dean - Events).

DAY 2

- The session commenced with a welcome address by Dr. T. Kavitha, Head of Civil Engineering.
- Dr. V. Priyadarshini introduced the guest speaker, Mrs. S. Padma Priya, Managing Trustee of Vidhai Vidaipom.
- She was honored with the "VEERAMANGAI" Award for her outstanding contributions to environmental conservation, presented by Dr. S. Kalidoss, Senior Additional Registrar.

DAY 3

- The third day began with a welcome note by Dr. T. Kavitha.
- Dr. P. Gomathi Nagajothi introduced the chief guest, Mrs. T. Aruna, Urban Planning Management Expert, Government of Puducherry.
- In recognition of her excellence in urban planning, she was presented with the "VEERAMANGAI" Award by Dr. Felix Kala.

"Empowered women build empowered communities and create a better tomorrow."

FIELD TRIP

EXPLORING NATURE, LEARNING BEYOND CLASSROOM

21.09.2022 to 23.09.2022

A three-day curriculum-based field trip was organized to Salem, Namakkal, Sithampoondi, Kanjamalai, and Yercaud from 21.09.2022 to 23.09.2022.

During the visit, students gained practical exposure to mineral exploration, groundwater potential assessment through geophysical resistivity surveys, iron ore mineralization studies, and mining operations.

They learned field techniques such as measuring strike and dip using a Brunton compass, identified source rocks, and collected various mineral specimens including limonite, laterite, magnetite, chromite, and bauxite.

The students also visited TANMAG and TAMIN mining sites to understand open-cast and semi-mechanized mining methods.

collected 25 varieties of rock and mineral specimens and acquired valuable hands-on geological knowledge through field investigations.

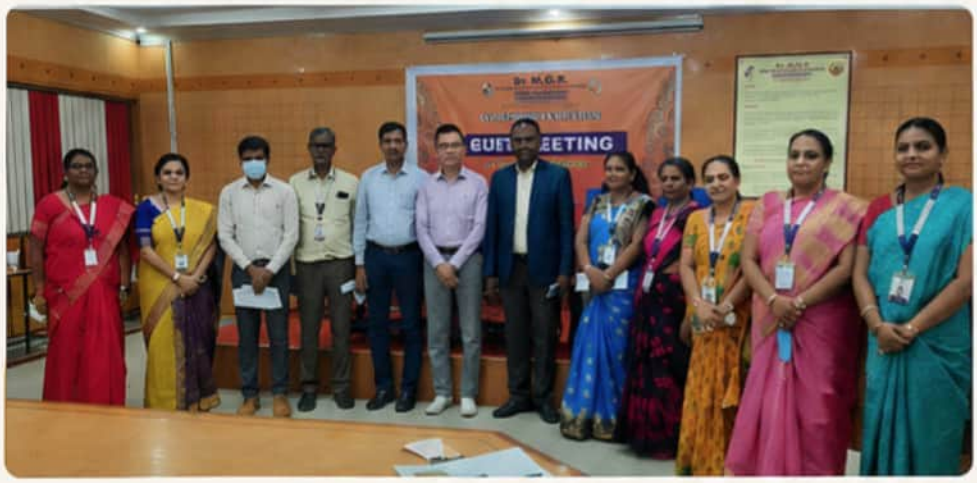
Field study and observation

Measuring strike and dip using Brunton compass

Open-cast and semi-mechanized mining

Learning, Exploring & Growing Together

GUEST LECTURE



JAPANESE ENDOWED COURSE (JEC):

In October 2022, a meeting was held with **Mr. Ko Shunkei** of **Hiyoshi Corporation**, Japan, to discuss the Japanese Endowed Course (JEC) program and opportunities for joint research collaborations.

Organized by the **International Relations & Collaboration Cell** and **ISO Cell**, the initiative was designed to benefit students and faculty members from five departments by promoting international learning and academic cooperation.

The Institution of Engineers (India)

37th INDIAN ENGINEERING CONGRESS

37TH INDIAN ENGINEERING CONGRESS

The 37th Indian Engineering Congress, organized by **The Institution of Engineers**, was held at Le Meridien, Chennai.

On the second day **(16.12.2022)**, the memorial lecture focused on **Sustainable Development and Energy Conservation.**

Distinguished speakers, including **Dr. R. Velraj,** Vice-Chancellor of Anna University, **Vikas Kumar,** Chairman of Delhi Metro, and **R.S. Sodhi,** Managing Director of Amul, shared valuable insights on the crucial role of engineers in promoting energy efficiency and sustainable development.

DISTINGUISHED SPEAKERS

Dr. R. Velraj
Vice-Chancellor
Anna University

Sustainable Development and Energy Conservation

Vikas Kumar
Chairman
Delhi Metro

Innovations and Sustainable Urban Transport

R.S. Sodhi
Managing Director
Amul

Sustainability, Innovation and Nation Building

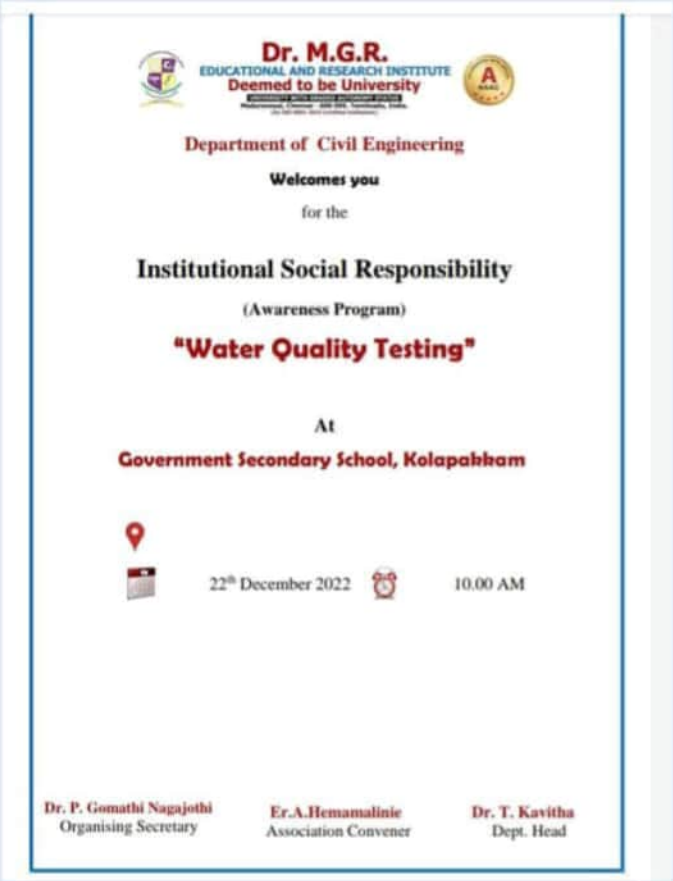
INAGURAL CEREMONY / ISR EVENT

INAGURAL CEREMONY OF INDIAN PLUMBING ASSOCIATION STUDENT CHAPTER I – 071

7th Sept 2022, Seminar Hall, Main Campus.

ISR EVENT - School Program – Online Quiz Competition on AI and Machine Learning

DATE: 3rd Jul 2022 till 15th Jul 2022



An ISR activity on Water Quality Testing Awareness was conducted on 22.12.2022 for students of Government Higher Secondary School, Kolapakkam. Dr. R.M. Narayanan educated students on the importance of water quality testing and demonstrated the measurement of pH, TDS, DO, residual chlorine, and iron content using testing kits. Final-year and third-year students actively participated and distributed awareness pamphlets to the local community.

STUDENT ARTICLE

EMERGING TRENDS IN SUSTAINABLE INFRASTRUCTURE DEVELOPMENT

Civil Engineering is a profession that directly contributes to the development of society through the planning, design, construction, and maintenance of infrastructure. As a Civil Engineering student, I am fascinated by how engineering solutions improve transportation, water resources, housing, and environmental sustainability.

Today, the construction industry is rapidly evolving with the adoption of modern technologies such as **Building Information Modeling (BIM), Geographic Information Systems (GIS), Artificial Intelligence (AI), and smart construction techniques**. These innovations help engineers enhance project efficiency, reduce costs, and improve the quality of infrastructure projects.

One of the most important areas of focus in modern Civil Engineering is **sustainability**. Sustainable infrastructure aims to minimize environmental impacts while ensuring long-term economic and social benefits. **Green buildings, energy-efficient structures, recycled construction materials, and rainwater harvesting systems** are becoming essential components of contemporary engineering practice.

Civil engineers also play a crucial role in addressing global challenges such as **climate change, urbanization, and water scarcity**. Through innovative solutions in transportation planning, environmental engineering, and disaster-resistant construction, engineers contribute significantly to creating safer and more resilient communities.

As a student of the Department of Civil Engineering, I continuously strive to enhance my technical knowledge and practical skills through academic learning, laboratory work, technical events, and project activities. The exposure to emerging technologies and industry practices prepares me to become a **competent professional** capable of contributing to the development of sustainable infrastructure.

I believe that the future of Civil Engineering lies in integrating **technology, innovation, and environmental responsibility**. By embracing these principles, we can create infrastructure that not only serves present needs but also preserves resources for future generations.

KEY EMERGING TRENDS

- Building Information Modeling (BIM)
- Geographic Information Systems (GIS)
- Artificial Intelligence in Construction
- Smart Infrastructure Systems
- Green Building Technologies
- Recycled Construction Materials
- Rainwater Harvesting Systems
- Climate-Resilient Infrastructure

STUDENT REFLECTION

> *"The future of infrastructure development depends on sustainable engineering practices that balance economic growth, environmental protection, and social well-being."*

> *"Civil Engineers build more than structures—they build the foundation for a sustainable future."*

By **RANAE RODERICK J**
Reg. No.: 201051101602
Department of Civil Engineering

Department of Civil Engineering

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DEPARTMENT OF
CIVIL
ENGINEERING

TECHNICAL NEWSLETTER | STUDENT CORNER

ARTICLE 1

SUSTAINABLE CONSTRUCTION PRACTICES

Building a Better Tomorrow

Sustainable construction focuses on designing and constructing infrastructive by minimizing environmental impacts and using resources efficiently throughout the life cycle of a project. It aims to create structures that are economically viable, environmentally responsible, and socially beneficial.

By adopting green materials, energy-efficient technologies, and innovative construction methods, civil engineers can contribute to a resilient and sustainable future.

TECHNICAL HIGHLIGHTS

- Fly ash replacement in concrete reduces CO_2 emissions by up to 30%.
- Green buildings can save 20–30% of energy and 30–50% of water.
- Use of recycled aggregates can reduce natural resource depletion by up to 40%.
- Sustainable practices reduce life cycle cost by 8–12%.

KEY SUSTAINABLE PRACTICES

Use of Eco-friendly Materials
Utilizing fly ash bricks, recycled aggregates, bamboo, and low-VOC materials.

Energy Efficiency
Optimized building orientation, natural lighting, insulation, and efficient HVAC systems.

Water Conservation
Rainwater harvesting, low flow fixtures, and water recycling systems.

Waste Management
Segregation, recycling of construction waste, and proper disposal methods.

Green Building Certification
Adoption of standards like IGBC, GRIHA, LEED to ensure environmental sustainability.

BENEFITS

- Reduced Carbon Footprint
- Lower Operating Cost
- Healthier Living Environment
- Improved Resource Conservation
- Enhanced Durability and Value

APPLICATIONS

- Green residential and commercial buildings
- Sustainable infrastructure projects
- Eco-friendly roads and pavements
- Water-efficient landscaping and urban development

THE WAY FORWARD

Sustainable construction is not just an alternative, it is a necessity for the future. As civil engineering students and future professionals, it is our responsibility to adopt sustainable solutions and build infrastructure that meets today's needs without compromising the ability of future generations.

STUDENT CONTRIBUTORS			
S. NO.	NAME	REGISTER NUMBER	ROLE
1.	Arjun Prakash	211051101781	Lead Writer & Research
2.	Nikhil Varma	211051101606	Content Development
3.	Leena Mary Thomas	211051101607	Technical Review
4.	Inao Shannan	211051101608	Design & Compilation

"Sustainability is not an option; it is the foundation of future construction."

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ARTICLE 2

ARTIFICIAL INTELLIGENCE IN CIVIL ENGINEERING

Smart Technology for Smarter Infrastructure

Artificial Intelligence (AI) is revolutionizing the civil engineering industry by enhancing productivity, improving accuracy and enabling data-driven decision making throughout the life cycle of a project.

AI tools and algorithms help engineers analyze large datasets, predict outcomes, automate repetitive tasks, and optimize infrastructure performance for a smarter and more sustainable future.

APPLICATIONS OF AI IN CIVIL ENGINEERING

- Project Planning & Scheduling
- Structural Health Monitoring
- Risk Assessment & Prediction
- Construction Automation
- Smart Traffic Management

TECHNICAL INSIGHTS

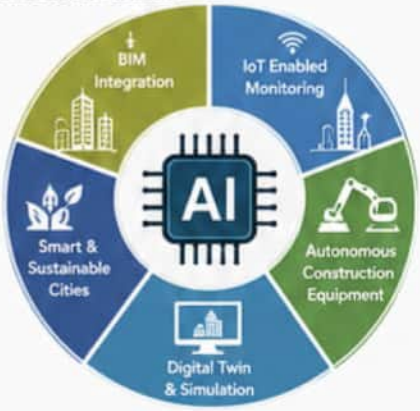
- Machine learning algorithms analyze historical project data to predict cost overruns with up to 90% accuracy.
- AI-based image recognition improves defect detection in structures by 70%.
- Drones with AI can monitor large sites and generate 3D models within hours.
- AI optimizes resource allocation, reducing delays by 20–25%.
- Natural Language Processing (NLP) assists in automatic report generation and documentation.

BENEFITS

- Improved Decision Making
- Enhanced Safety
- Time & Cost Savings
- Predictive Maintenance
- Better Risk Management

FUTURE SCOPE

AI, when combined with BIM, IoT and GIS, will lead to autonomous construction sites, smart infrastructure and resilient cities of the future.



STUDENT CONTRIBUTORS

S. NO.	NAME	REGISTER NUMBER	ROLE
1.	Avinash. P	211051101609	Lead Writer & Research
2.	Mohan Kumar. G	211051101610	Content Development
3.	Santhosh. V	211051101611	Technical Analysis
4.	Susindar. S	211051101612	Design & Compilation

> *"AI empowers engineers to build smarter, safer and more efficient infrastructure."*

AI is not replacing engineers, but empowering them to engineer a better future.

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DEPARTMENT OF CIVIL ENGINEERING

TECHNICAL NEWSLETTER | STUDENT CORNER | ARTICLE 3

RAINWATER HARVESTING:
A SUSTAINABLE WATER SOLUTION

Conserve Water, Secure Future

Rainwater harvesting is the simple technique of collecting and storing rainwater for future use. It helps in recharging groundwater, reducing flooding and conserving water resources.

HOW IT WORKS

TYPES OF RAINWATER HARVESTING

Rooftop Rainwater Harvesting
Collecting rainwater from rooftops and storing it for direct use or groundwater recharge.

Surface Runoff Harvesting
Collecting rainwater from open areas such as roads, parks and playgrounds and directing it to storage or recharge structures.

TECHNICAL BENEFITS

- Increases groundwater level
- Reduces urban flooding
- Provides supplementary water supply
- Low maintenance and cost effective
- Promotes water conservation and sustainability

DESIGN CONSIDERATIONS

- **Annual rainfall** – Higher rainfall increases the potential yield.
- **Roof area** – Larger roof area provides more collection.
- **Runoff coefficient** – Depends on roof material and slope.
- **Storage capacity** – Size depends on requirement and rainfall.
- **Quality of water** – Proper filtration ensures clean water.
- **Maintenance** – Regular cleaning of roof, gutters and filters.

EXAMPLE OF RAINWATER HARVESTING SYSTEM

ESTIMATED IMPACT

- Up to 50% reduction in demand for municipal water
- Groundwater recharge increase by 20–40%
- Reduces urban flooding significantly
- Long-term savings on water bills

STUDENT CONTRIBUTORS

S. No.	Name	Register Number	Role
1.	Jagannath G.	211051101613	Lead Writer & Research
2.	Ananth M.	211051101614	Content Development
3.	Pious Niranjan A.	211051101615	Technical Analysis
4.	Vishwa G.	211051101616	Design & Compilation

Every drop collected today is a step towards a water-secure tomorrow.

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ARTICLE 4

SMART CITIES AND URBAN DEVELOPMENT

Building Intelligent and Sustaianble Cities

Smart cities integrate physical infrastructure with digital technologies to improve the quality of life, ensure efficient services and promote sustainable urban development.

By leveraging data, connectivity and innovation, smart cities create a future-ready urban ecosystem.

KEY COMPONENTS OF SMART CITIES

- Smart Transport
- Smart Energy
- Smart Buildings
- Smart Waste Management
- Smart Water Management
- E-Governance & Citizen Services

TECHNOLOGIES INVOLVED

- Internet of Things (IoT)
- Geographic Information Systems (GIS)
- Building Information Modeling (BIM)
- Big Data Analytics
- Cloud Computing

BENEFITS

- Efficient use of resources
- Reduced environmental impact
- Improved mobility and safety
- Better public services
- Enhanced economic growth

CHALLENGES

- High initial investment
- Data security and privacy
- Interdepartmental coordination
- Continuous maintenance and monitoring

STUDENT CONTRIBUTORS

S. No.	Name	Register Number	Role
1.	Hinokali Jimo	211051101617	Lead Writer & Research
2.	Mercy Rengma	211051101618	Content Development
3.	Shanmugavelan M	211051101619	Technical Analysis
4.	Preethi.R	211051101620	Design & Compilation

APPLICATIONS OF SMART CITIES

Intelligent Traffic Systems
Real-time traffic monitoring and signal optimization reduce congestion.

Smart Street Lighting
Sensor-based lighting saves energy and enhances safety.

Waste Management
Smart bins and route optimization improve collection efficiency.

Water Management
Leak detection and real-time monitoring ensure efficient water distribution.

Disaster Management
Early warning systems and data analytics help minimize risks.

Public Services
Digital platforms enhance citizen engagement and service delivery.

THE FUTURE OF SMART CITIES

The future lies in creating resilient, inclusive and sustainable cities that leverage technology for the betterment of communities and the environment.

Sustainable Environment → Better Quality of Life → Technological Advancement → Economic Prosperity

Smart infrastructure creates smarter communities.

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ARTICLE 5

INNOVATIONS IN TRANSPORTATION ENGINEERING

Driving the Future of Mobility

Innovations in transportation engineering aim to develop safe, efficient, sustainable and intelligent transportation systems to meet the growing demands of urbanization and mobility.

KEY INNOVATIONS

Intelligent Transportation Systems (ITS)
Real-time traffic monitoring, adaptive signals and smart parking.

Sustainable Pavement Technologies
Use of recycled materials, warm mix asphalt and permeable pavements.

Electric and Green Mobility
EV infrastructure, charging stations and promotion of public transport.

Automated and Connected Vehicles
Enhances safety, reduces human error and improves traffic flow.

Advanced Construction Techniques
Use of BIM, drones, prefabrication and 3D printing for faster construction.

TECHNICAL INSIGHTS

- ITS can reduce traffic congestion by 20–30% through real-time data.
- Permeable pavements reduce surface runoff by 40–60%.
- EV adoption can cut greenhouse gas emissions by up to 50%.
- Automated systems improve road safety and reduce accidents.

FUTURE TRENDS

- **Hyperloop Technology**
- **Smart Highways**
- **Drone Based Monitoring**
- **Integrated Multi-modal Transport**

IMPACT ON SOCIETY

- Improved road safety and reduced accidents
- Reduced travel time and improved connectivity
- Lower environmental impact and sustainable development
- Cost savings in construction and maintenance
- Enhanced quality of life and economic growth

APPLICATION AREAS

- Urban transportation planning
- Highway and expressway projects
- Public transportation systems
- Traffic management and control
- Airport, metro and rail infrastructure
- Smart parking and logistics

STUDENT CONTRIBUTORS

S. No.	Name	Register Number	Role
1.	Franklin Anbu Raj B	211051101621	Lead Writer & Research
2.	Ananth S	211051101622	Content Development
3.	Abishek Kumar Singh	211051101623	Technical Analysis

SUSTAINABLE GOALS SUPPORTED

THE WAY FORWARD

The future of transportation lies in innovation, integration and sustainability. By embracing advanced technologies and sustainable practices, transportation engineers can build smarter, safer and more efficient mobility systems for a better tomorrow.

"Efficient transportation networks drive the progress of a nation."

EDITORIAL BOARD

CHIEF EDITORS – FACULTY INCHARGE

Dr.M.Narmatha
[Professor]

STUDENT COORDINATORS

Nikil Bharawaj
B.Tech , VII SEM

Nooruz Zoha
B.Tech , VI SEM

Rahul Rajpirohit
B.Tech , III year


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