



YASHODA SHIKSHAN PRASARAK MANDAL'S  
**YASHODA TECHNICAL CAMPUS, SATARA**  
**DEPARTMENT OF CIVIL ENGINEERING**

# **CONSTRMATIX**

**DEPARTMENT OF CIVIL ENGINEERING**

**JANUARY - JUNE 2026**





# Yashoda Technical Campus, Satara

Department of Civil Engineering

## CONSTROMATIX

JANUARY - JUNE 2026

### PRESIDENT'S DESK



**Founder, President**

**Hon. Prof. Dasharath B. Sagare**

We warmly welcome you to YSPM's Yashoda Technical Campus, Satara, an institution dedicated to providing value-based, quality education and nurturing confident, skilled, and responsible professionals. Our institutes are approved by the respective statutory authorities and follow all prescribed norms and standards. Located in a serene, lush green, and pollution-free environment, the campus provides excellent facilities including well-equipped laboratories, spacious classrooms, ICT-enabled smart classrooms, seminar halls, a rich library and e-library, Wi-Fi and internet-enabled computer centres, sports facilities, and separate gymnasiums for boys and girls. Our qualified and dedicated faculty focuses on the academic and overall development of every student by encouraging excellence in academics, co-curricular and extracurricular activities, teamwork, leadership, innovation, industry interaction, and multidisciplinary learning. The campus also offers essential amenities such as transportation, hostel accommodation, cafeteria, cooperative store, and other student-support facilities. We are committed to developing knowledge, skills, confidence, and positive attitudes that prepare students to meet future challenges and achieve their aspirations. We extend our best wishes to all our students for a bright, successful, and prosperous future.

### GREETINGS TO ALL!

It is my honour and privilege to serve as the Principal of Yashoda Technical Campus (YTC), Satara, and I sincerely express my gratitude to the Management of Yashoda Shikshan Prasarak Mandal (YSPM), Satara, for giving me the opportunity to serve the institution and community as a member of the YSPM family. At YTC, we believe that the sustained growth and success of an educational institution depend on the happiness, trust, and satisfaction of students, parents, and all stakeholders. Our endeavour is to fulfil the aspirations of every student through Academic Excellence, Research Excellence, Training and Placement Excellence, and holistic development, while providing outcome-based technical education that develops knowledge, skills, confidence, and values. Our guiding philosophy, "Parents' and Students' Dreams are Our Institute's Mission," inspires us to work collectively towards creating. I warmly invite everyone to join hands with us in our journey towards excellence in technical education and the holistic development of our students. Together, let us nurture young minds, transform dreams into reality, and empower our students to achieve success and make meaningful contributions to society. I extend my heartfelt wishes to every student for a bright, successful, and fulfilling future.

### PRINCIPAL'S DESK



**Principal**

**Prof. Dr. Vikram S. Patil**



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**HOD DESK****Head of Department****Prof. Dr. Abhijit M Zende**

At YSPM's Civil Engineering Department, we are committed to nurturing competent, innovative, and socially responsible civil engineers through quality academic programs, modern infrastructure, research opportunities, and hands-on learning experiences. Our dedicated and experienced faculty members foster an environment that encourages innovation, critical thinking, creativity, collaboration, and professional excellence. We provide students with diverse opportunities to engage in research, industry interaction, practical projects, co-curricular activities, and professional development, enabling them to confidently meet the evolving challenges of the civil engineering profession. Through our technical magazine, we invite students, alumni, prospective learners, and members of the engineering community to explore the achievements, opportunities, and initiatives of our department. We take immense pride in the accomplishments of our students, faculty, and staff and remain committed to continuously advancing the boundaries of civil engineering education, research, and innovation. We warmly welcome you to be a part of our journey towards excellence, innovation, and meaningful contribution to society.

**EDITORIAL DESK****Editor In Chief****Prof. Mr. Ajinkya S Shah**

On behalf of the Editorial Board, it gives me immense pleasure and pride to present Constromatix, the biannual technical magazine of the Civil Engineering Department. This magazine is a reflection of the creativity, knowledge, achievements, and enthusiasm of our students and faculty, made possible through the sincere efforts and valuable contributions of our technical team, writers, and contributors. As one of the oldest and most diverse branches of engineering, Civil Engineering offers immense opportunities for innovation, research, and professional growth. Constromatix aims to highlight emerging trends and developments in civil engineering while providing a vibrant platform for students and staff to showcase their talents in technical, cultural, and sports activities. It also encourages students to share articles, ideas, and perspectives on topics of their interest and current developments in the profession. Through this initiative, our department remains committed to providing quality technical education while nurturing leadership, managerial skills, creativity, social awareness, and a sense of responsibility towards society. We look forward to continued enthusiasm, dedication, and valuable contributions from all our students and faculty in making Constromatix a meaningful and inspiring platform for the Civil Engineering community.

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# Yashoda Technical Campus, Satara

## Department of Civil Engineering

# Constromatix

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### OVERVIEW OF DEPARTMENT

Welcome to the Department of Civil Engineering at YSPM's Yashoda Technical Campus, Satara. The department has been immensely successfully working from 2011 in the field of Professional Knowledge and advanced technical world. The department offers 4 years Bachelor of Technology in Civil Engineering.. The department undergoes several curricular and extra-curricular activities throughout the year. The department is having mixture of well experienced and young, enthusiastic faculty members who are involved in industry institute interaction besides their day to day teaching activities. The Department of Civil Engineering at Yashoda Technical Campus (YTC) delivers latest knowledge in Civil Engineering . It prepares students for careers in industry, academia, and also create young entrepreneurs.

### STRENGTH OF DEPARTMENT

- Well Qualified, Experienced staff
- Good infrastructure
- Well-equipped laboratories
- Excellent academic performance
- Departmental Library facility for students.

### Vision of the Department

To become a center of excellence by producing Civil engineers having research and development activity, sound technical knowledge, professional skills and social awareness to serve society.

### Mission of the Department

M1: To impart quality technical education through interactive teaching learning methods.

M2: To promote research and development activity by encouraging creativity and exposure to real world problems.

M3: To mentor students for innovative thinking with relevance to entrepreneurship.

M4: To develop social awareness in graduates to serve society.

### Program Educational Objectives (PEOs)

PEO1: Demonstrate technical expertise, leadership and ethical qualities to design & execute Civil Engineering Projects.

PEO2: Exhibit qualities of teamwork with effective communication, lifelong learning to address real world civil engineering problems.

PEO3: Develop sensitivity towards environment and society for sustainable development including disaster management.

### Program Specific Outcomes (PSOs)

PSO-1: The graduates will analyze and mitigate the natural disasters for the effective disaster management.

PSO-2: The graduates will be able to acquire sound technical knowledge to analyze and work on critical civil engineering issues

PSO-3: The graduates will be enhancing professional abilities to meet industrial need.



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## International Placement for Civil Engineering

# Proud Moments!

**Our Brilliant Civil Engineers Reach Japan**

We are elated to announce that our **Civil Engineering** students have been selected for job opportunities in **Japan** with impressive packages.

*Dream  
Learn  
Achieve  
Go Global!*



**Mr. Sahil Shevate**

**22  
LPA!**



**Mr. Akshay Pawar**

**18  
LPA!**



**Mr. Ajit Dounde**

**25  
LPA!**



From  
**Yashoda to Japan**  
Engineering Global Opportunities...

*Heartiest Congratulations*  
for this remarkable achievement!

*Your Success Inspires Many More to Dream Beyond Borders!*

Wishing you  
a bright and successful  
future ahead!



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**Editor-in-Chief**

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Prof. Chandrahas B. Patil

**Head of the Department**

Dr. Abhijit M. Zende

**Principal**

Prof. Dr. Vikram S. Patil

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**Mr. Tushar D Gaikwad**

**Mr. Prem D Bhandari**



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## THE INDIRA SAGAR DAM - INDIA'S LARGEST DAM



The Indira Sagar Dam, constructed across the Narmada River in Khandwa district of Madhya Pradesh, is one of India's significant multipurpose water resource projects. The dam is a concrete gravity structure approximately 92 m high and 653 m long, creating the large Indira Sagar Reservoir with a gross storage capacity of about 12.22 billion m<sup>3</sup>. The project has been developed primarily for irrigation and hydroelectric power generation. Its associated powerhouse has an installed capacity of 1,000 MW, comprising eight generating units of 125 MW each. The stored water also supports regulated downstream flow and contributes to regional agricultural and economic development.

From a civil engineering perspective, the project represents the integration of dam engineering, hydrology, structural analysis, geotechnical engineering and hydraulic design on a large scale. The concrete gravity dam relies on its own weight to resist hydraulic forces, while the spillway and associated hydraulic structures are designed to safely manage excess flood discharge. The project demonstrates the importance of foundation investigation, stability against sliding and overturning, seepage control, reservoir operation and structural monitoring in large dams. Indira Sagar therefore serves as an important case study for civil engineering students and professionals, illustrating how large hydraulic infrastructure can combine water storage, irrigation and renewable energy generation while requiring continuous attention to structural safety and sustainable water-resource management.

**Mr. Shahid N Mulla (Final Year Civil)**



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## SMART CONSTRUCTION AND ROBOTICS



Smart construction represents the integration of digital technologies, automation, robotics and data-driven decision-making into conventional construction practices. Technologies such as Building Information Modelling (BIM), Internet of Things (IoT), Artificial Intelligence (AI), drones, LiDAR, computer vision and cloud-based project management systems are increasingly being used throughout the project lifecycle. IoT-enabled sensors can continuously monitor parameters such as concrete temperature, structural deformation, vibration, humidity and equipment performance, while AI-based systems analyse this data to support predictive maintenance and construction planning. Drones and LiDAR provide rapid 3D site surveying, topographic mapping, progress monitoring and volumetric measurements, reducing the time and effort required for conventional surveying operations.

Robotics and automated construction equipment are further transforming site operations by performing repetitive, hazardous and highly precise activities. Robotic systems are being developed for bricklaying, concrete 3D printing, rebar placement, drilling, demolition, material transportation and autonomous earthmoving. Robotic total stations, autonomous machinery and computer-vision systems can improve positioning accuracy and monitor construction progress against BIM models. In addition, 3D concrete printing enables layer-by-layer fabrication of structural and non-structural components with reduced formwork requirements and potentially lower material wastage. The convergence of robotics, BIM, AI and real-time sensing is moving construction towards a more automated, safer, productive and data-driven industry, while also creating new requirements for engineers skilled in digital construction technologies.

**Mr. Prem D Bhandari (TY Civil)**



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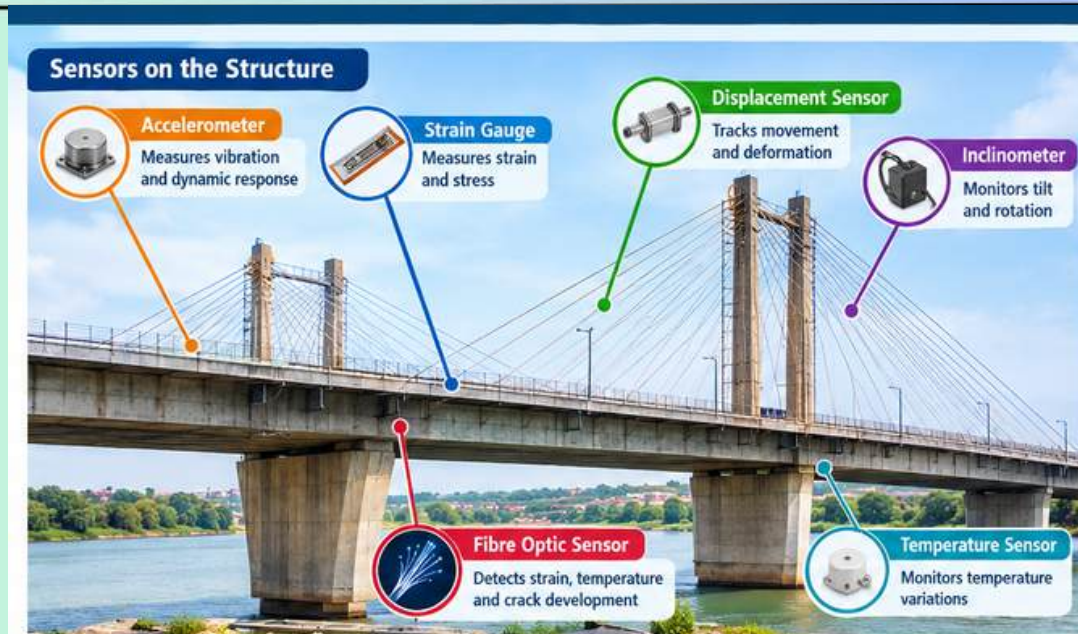
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**Structural Health Monitoring (SHM)**

Structural Health Monitoring (SHM) is an advanced engineering approach used to continuously assess the condition, performance and safety of civil infrastructure such as bridges, buildings, dams, tunnels and towers. SHM systems integrate sensors, data acquisition units, communication networks and analytical algorithms to detect changes in structural behaviour. Sensors such as accelerometers, strain gauges, displacement sensors, inclinometers, piezoelectric sensors and distributed fibre-optic sensors can measure parameters including strain, vibration, deformation, crack development and temperature. The collected data provides engineers with information about the actual response of a structure under traffic, wind, seismic loads and environmental conditions, enabling early identification of abnormal behaviour.

Recent developments in SHM are strongly influenced by Internet of Things (IoT), wireless sensor networks, Artificial Intelligence (AI), Machine Learning (ML), cloud computing and digital twins. AI and ML algorithms can process large volumes of monitoring data to identify damage patterns, classify structural defects and predict future deterioration. Fibre-optic sensing technologies offer high sensitivity and immunity to electromagnetic interference, making them suitable for long-term monitoring of critical infrastructure. Integration of SHM with digital twins can further enable real-time visualisation and condition assessment of structures. By shifting maintenance from a reactive approach to predictive and condition-based maintenance, SHM can improve structural reliability, extend service life, reduce maintenance costs and enhance public safety.

**Mr. Tushar D Gaikwad (Final Year Civil)****YASHODA INSTITUTES, SATARA****ENGINEERING (B.TECH)****POLYTECHNIC****INSTITUTE CODE: 6757****NAAC B+****ARCHITECTURE (B.Arch) 6880****MBA / MCA / PHARMACY (D/B/M)**

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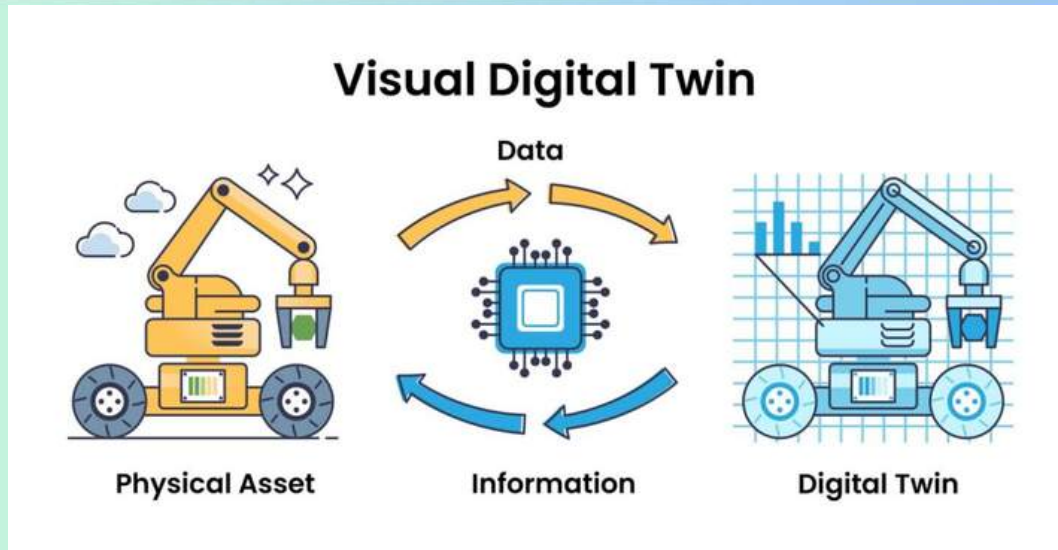
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## Digital Twins



A Digital Twin is a dynamic virtual representation of a physical asset, structure, or system that uses real-time data to replicate its behaviour and condition. In civil engineering, Digital Twins can be developed for buildings, bridges, dams, highways, tunnels, and other infrastructure. Data from IoT sensors, drones, remote sensing, BIM models, and Structural Health Monitoring (SHM) systems can be continuously integrated into the virtual model. Parameters such as stress, strain, vibration, temperature, displacement, settlement, and crack development can therefore be monitored without relying only on periodic physical inspections.

The integration of Artificial Intelligence (AI) and Machine Learning (ML) makes Digital Twins more powerful for infrastructure management. AI algorithms can process large volumes of monitoring data, identify abnormal behaviour, detect early signs of structural deterioration, and predict possible failures. For example, a Digital Twin of a bridge can compare its current structural response with historical and design data to identify changes in stiffness, vibration characteristics, or deformation. This supports condition assessment and helps engineers make informed decisions regarding inspection, repair, strengthening, and rehabilitation.

Digital Twins also contribute to predictive maintenance, improved safety, optimized resource utilization, and extended service life of infrastructure. Instead of responding to damage after it becomes visible, engineers can use continuously updated digital models to predict deterioration and plan maintenance at the appropriate time. Integration with BIM, GIS, IoT, cloud computing, AI, and SHM is transforming conventional infrastructure management into a data-driven approach. As smart cities and resilient infrastructure become increasingly important, Digital Twin technology is expected to play a significant role in the planning, construction, operation, and maintenance of future civil engineering assets.

Prof. Prashant G Borate



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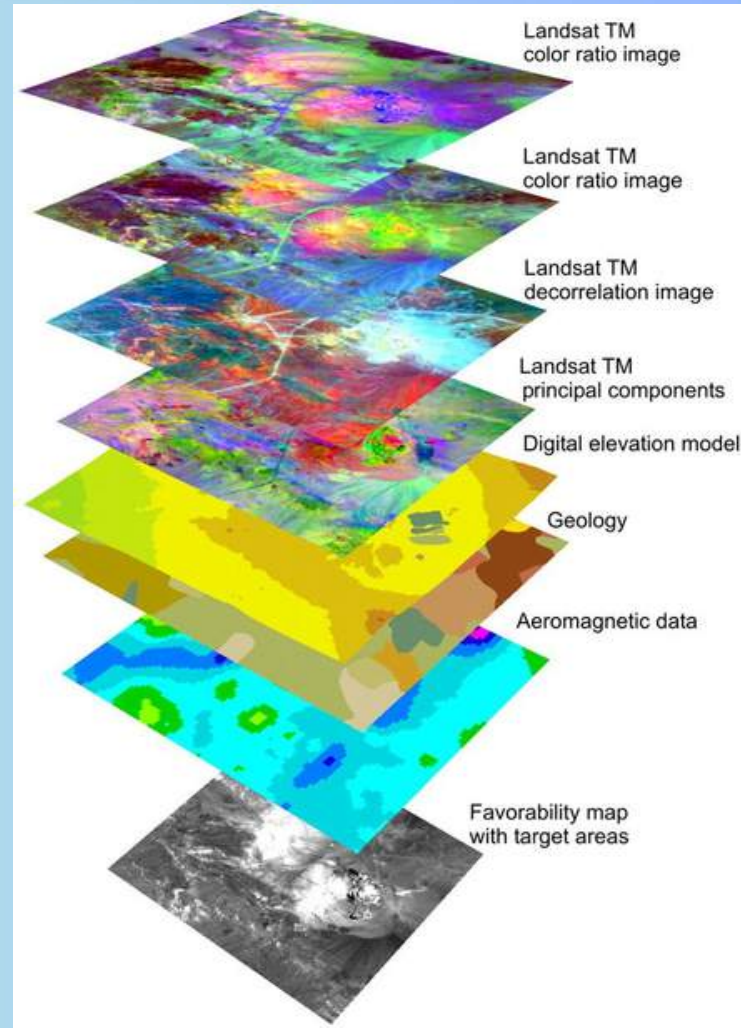
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## Remote Sensing and GIS: The Eyes of Modern Civil Engineering

Remote Sensing (RS) and Geographic Information Systems (GIS) have become powerful tools in modern civil engineering by enabling engineers to collect, analyse, and visualize spatial information over large areas. Remote sensing uses satellite imagery, aerial photography, and drone-based sensors to obtain information about the Earth's surface without direct physical contact, while GIS integrates this information with geographic and engineering datasets to create detailed digital maps. These technologies are widely used in land-use mapping, topographic analysis, urban planning, transportation planning, watershed management, environmental monitoring, and infrastructure development. Compared with conventional surveying alone, RS and GIS can provide faster coverage of large and difficult-to-access areas. The integration of RS and GIS with GPS, drones, LiDAR, Artificial Intelligence (AI), and Machine Learning (ML) is further transforming civil engineering practices.



Engineers can use satellite and drone data to monitor construction progress, identify changes in land use, assess flood and landslide risks, analyse urban expansion, and monitor the condition of infrastructure. GIS-based spatial analysis also supports better decision-making by combining multiple layers such as elevation, drainage, geology, land use, roads, and population. Thus, RS and GIS act as the “eyes” of modern civil engineering, providing accurate spatial information that supports safer, faster, sustainable, and data-driven planning and management of infrastructure.

Prof. Vaibhav B Kashyap



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## STUDENT'S ACHIEVEMENTS - Elite NPTEL Certification



Mr. Yash P Waskar



Mr. Uday D Wagh



Mr. Utkarsh U Kathale



Mr. Shahid n mulla



Ms. Sakshi V Pawar



Mr. Omkar D deshmu



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## STUDENT'S ACHIEVEMENTS - Publication





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## STUDENT'S Publication Certification

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PAPER ID :- 1718516

*Sanket Patel*  
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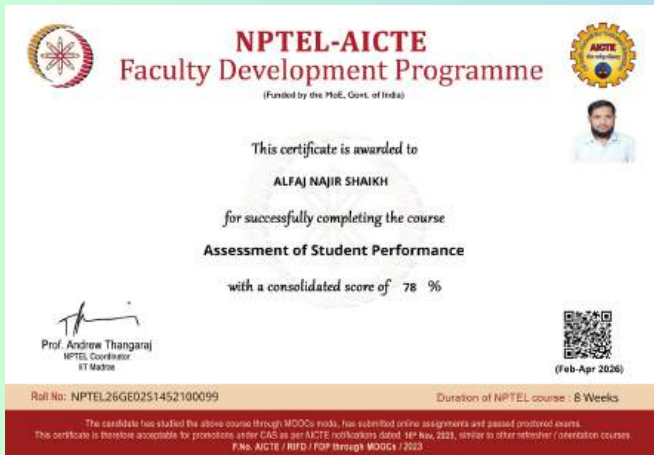
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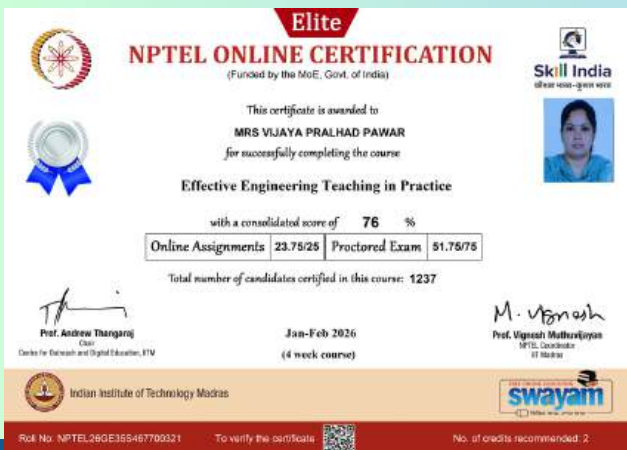
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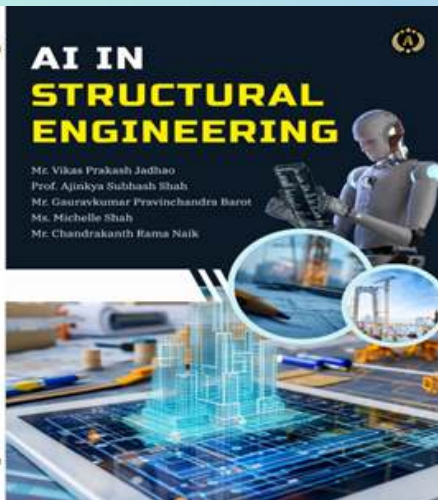
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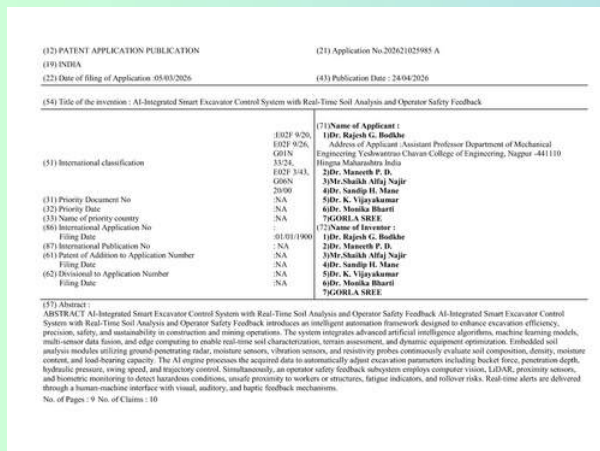
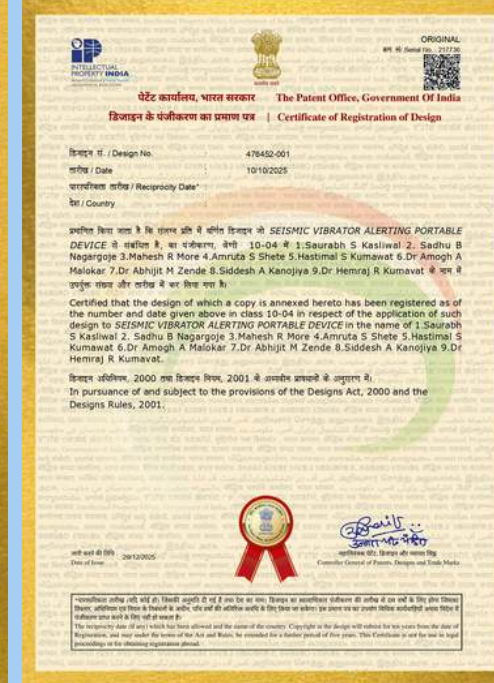
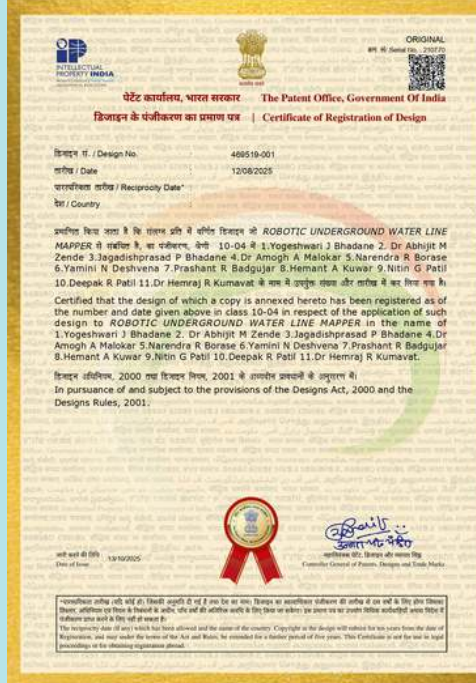
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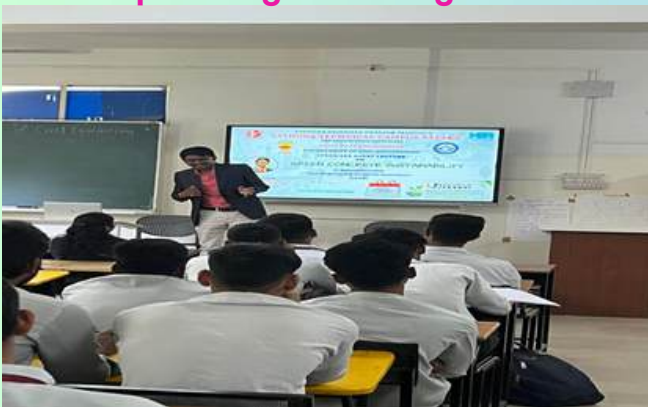
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