

Volume: IV



2023–2024

TERRA NIRMAN



Building Foundations, Shaping Futures

Smart and Sustainable Infrastructure



DEPARTMENT OF CIVIL

Engineering



Vision:

To impart quality education in Civil Engineering.

Mission:

M1 :To provide an experiential teaching-learning environment and promote research culture.

M2: To establish a center of excellence by providing training of modern tools and emerging technologies.

M3: To instill social and ethical values among the students.

Program Specific Objectives (PSOs):

PSO1: Plan & design civil engineering structures using modern tools in compliance with Indian standard codes.

PSO2: Address & give engineering solutions for environmental challenges & sustainable development.

PSO3: Apply management tools & techniques to plan, execute and monitor civil engineering projects ensuring timely completion and cost effectiveness.

Program Educational Objectives (PEOs):

PEO1: Apply integrated knowledge and skills to solve complex civil engineering problems.

PEO2: Pursue entrepreneurship and innovation in civil engineering while upholding professional integrity, social responsibility, and ethical values.

PEO3: Excel in professional careers exhibiting leadership qualities.

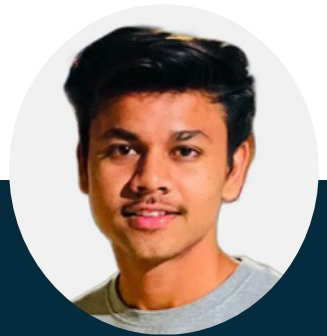
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TERRA NIRMAN

Building Foundations, Shaping Futures

The Department of Civil Engineering is delighted to present the inaugural edition of its annual magazine, Terra Nirman—a dedicated platform that reflects our unwavering commitment to sustainability, innovation, and academic excellence. The name Terra Nirman, derived from the concept of “solid ground,” represents not only the physical foundations we design and construct, but also the intellectual and ethical foundations we aim to instill in our students. This magazine serves as a window into the dynamic world of civil engineering, showcasing a rich blend of academic accomplishments, cutting-edge research, student initiatives, faculty insights, and industry engagement. It celebrates the creativity, resilience, and technical expertise that define our department, while also encouraging dialogue and collaboration within and beyond the academic sphere. Through Terra Nirman, we aspire to inspire, inform, and build a legacy of knowledge and innovation that supports a more sustainable and impactful future.



This magazine encapsulates our collective foundations and marks the beginning of a meaningful journey toward responsible engineering and sustainable development. This inaugural volume offers an engaging glimpse into the vibrant life of our department — highlighting academic milestones, student achievements, research innovations, and the shared vision that drives us forward



The magazine also documents our various activities throughout the academic year, including workshops, expert sessions, site visits, competitions, and social outreach programs. Each section of this edition demonstrates how our department continues to grow while staying grounded in its commitment to sustainability, knowledge-sharing, and industry relevance.

As you explore Terra Nirman, we invite you to walk through the efforts, aspirations, and accomplishments of our civil engineering community — a community that is not just constructing the world around us, but also shaping a more resilient and responsible tomorrow.

Welcome to Terra Nirman — where learning takes root and legacies are built.

Happy Reading!



Dr. Kamaljeet Kaur

Director Technical
Campus,
Ajeenkya D. Y. Patil
Knowledge City

At the outset, I heartily congratulate the Department of Civil Engineering for pioneering the concept of a theme-based departmental magazine. Terra Nirman reflects the spirit of creativity, innovation, and confidence within our academic ecosystem.

In today's era, where sustainability is not an option but an obligation, Terra Nirman embodies the transformative power of engineering education. It showcases how knowledge can be a beacon of environmental responsibility, bridging the gap between academic excellence and real-world impact

ADYPSOE continues to rise as a premier institution in Maharashtra — powered by our commitment to teaching, research, and leadership. Our interaction with global thinkers, corporate leaders, and researchers enriches our students and propels them forward.

I am pleased to see digital platforms being used innovatively to reach a wider audience. This magazine is more than a publication — it's a testament to our collective aspirations and achievements. I congratulate the Department and Editorial Team for launching this commendable initiative and look forward to more such inspiring endeavors.

DR. F. B. SAYYAD



Principal, Ajeenkya D Y
Patil School of
Engineering

At Ajeenkya D Y Patil School of Engineering (ADYPSOE), we believe that education is not limited to the pages of a textbook. It is a dynamic journey that encompasses knowledge, character, and holistic development. Our commitment to excellence is reflected through cutting-edge infrastructure, a student-friendly ecosystem, and an emphasis on experiential learning.

The launch of Terra Nirman, a theme-based departmental magazine, is a remarkable initiative by the Civil Engineering Department. It is a platform that celebrates innovation, sustainability, and the emerging role of engineers in building a responsible and resilient future. The content in this magazine reflects the creativity, enthusiasm, and technical capabilities of our students and faculty.

I am confident that Terra Nirman will not only serve as a source of knowledge and inspiration but will also strengthen the academic and cultural fabric of the department. It is a step forward in fostering awareness about smart and sustainable infrastructure among budding engineers.

I congratulate the editorial team and the department for their tireless efforts and vision. Let this magazine become a symbol of pride for the entire ADYPSOE family and encourage many more such intellectual and creative pursuits.

*A Vision for Innovation
and Growth: Thoughts
from Our HoD*

**LT. COL. SANJAY
KARODPATI
(RETD.)**

Head of the
Department



It gives me immense pleasure to present Terra Nirman — a departmental magazine that reflects the evolving spirit of civil engineering rooted in strength, sustainability, and innovation.

In today's world, the responsibility of civil engineers is no longer confined to constructing roads or buildings; it extends to designing smart, adaptive, and environmentally sound infrastructure. Engineers are now expected to act as guardians of progress and stewards of sustainability. This magazine is a powerful testament to how our students and faculty are embracing that responsibility with enthusiasm and purpose.

The content showcased in Terra Nirman demonstrates an impressive blend of technical knowledge, environmental sensitivity, and creative expression. It captures the transformation of ideas into impactful actions — ideas that contribute toward greener practices, energy efficient designs, and sustainable development models.

I commend the efforts of the entire editorial team, faculty mentors, and student contributors who brought this vision to life. Your dedication and passion have made this magazine not just a publication but a legacy that speaks of our values and aspirations.

Dr. Aakanksha Ingle

Editor-in-Chief,
Terra Nirman



It brings me great pride and joy to present the inaugural edition of Terra Nirman, a magazine born from vision, passion, and the shared aspiration to make an impact beyond the boundaries of our classrooms.

This magazine is more than a compilation of creative and technical content — it is a platform that celebrates the spirit of civil engineering through the lens of sustainability and innovation. In a world that increasingly calls for smart, resilient, and environmentally conscious solutions, we as educators and learners must rise to the occasion and respond with thought, integrity, and purpose.

Terra Nirman reflects our collective intent to build not just structures, but a sustainable future. The works featured here highlight how our students are exploring, experimenting, and engaging with real-world challenges — from climate-adaptive design to green construction practices. These stories remind us that every blueprint we create must consider the planet and the people it serves.

I extend heartfelt congratulations to the contributors, faculty mentors, and the dedicated editorial team whose creativity, diligence, and vision made this magazine possible. May this edition serve as a guiding light and a proud testimony to what we, as a community of learners and innovators, can achieve together.

MEET OUR CESA TEAM



Mr. Ketan Gaikwad
President



Mr. Prasanjeet Tompe
Vice president



Mr. Pawan Soni
General Secretary



Ms. Ashwani Dhanwani
Treasurer



Mr. Prasanna Deore
Event coordinator



Mr. Gaurav Garde
Design & Publicity Head



Mr. Taher Saluji
Technical Head



Ms. Tejaswini Tongire
Decoration Head



Mr. Aditya Chobe
Discipline In-charge



MEET OUR CESA TEAM



Ms. Pranali Kale
Class Representative



Mr. Tushar Patil
Class Representative



Mr. Shravan Phuge
Class Representative



Mr. Darshan Patole
Committee Member



Mr. Vaibhav Munde
Committee Member



Mr. Shubham Sapkale
Committee Member



Mr. Subhekshan Golap
Committee Member



Mr. Atharva Kashid
Anchoring Head



Theme about the Magazine

Smart and Sustainable Infrastructure

Each year, the Department of Civil Engineering selects a relevant and forward-thinking theme to align our academic and creative endeavors with the evolving landscape of the industry. For the academic year 2024–2025, we are proud to announce our annual theme: Latest Trends in Civil Engineering. This broad umbrella allows us to explore the most pressing innovations, ideas, and transformations shaping the future of the field.

As a part of this initiative, the theme for this semester's edition of Terra Nirman is Smart and Sustainable Infrastructure — a topic that encapsulates the core of what modern civil engineering aspires to achieve.

In an age where urbanization is expanding rapidly and climate change is an undeniable reality, infrastructure development can no longer follow traditional models alone. There is a need to integrate smart technologies such as IoT, AI-based monitoring systems, and data-driven designs with sustainable practices like green construction, energy efficiency, low-carbon materials, and water-sensitive urban planning.

This theme invites our students and faculty to reimagine infrastructure that is not only intelligent and adaptive but also environmentally responsible and resilient. It encourages exploring systems that are future-ready — able to respond to challenges such as urban congestion, climate impact, resource scarcity, and aging infrastructure.

Through this magazine, we aim to showcase how civil engineers are leading the charge in creating infrastructure that is not just built to last, but built to uplift — empowering communities while preserving the planet.

We hope Terra Nirman sparks curiosity, critical thinking, and commitment among readers to continue innovating at the intersection of technology, sustainability, and human-centered design.

Let this edition be a testament to our readiness to shape a smarter, greener world — one idea, one innovation at a time.

Intelligent Transportation Systems and Urban Mobility

Introduction

With urban populations rapidly increasing, cities around the world face mounting challenges related to traffic congestion, pollution, and inefficiencies in transportation. Intelligent Transportation Systems (ITS) offer innovative solutions to these problems by leveraging advanced technologies to create smarter, safer, and more sustainable mobility networks.

What is Intelligent

Transportation Systems (ITS)?

ITS refers to the application of information and communication technologies (ICT) in transportation to improve mobility, safety, and efficiency. These systems include real-time traffic monitoring, automated traffic control, smart public transportation, and vehicle-to-infrastructure communication.

Core Components of ITS

• Real-Time Traffic Management:

- cameras, and GPS data to monitor and control traffic flow.
- Smart Traffic Signals:** Adapt signal timings based on real-time traffic conditions.
- Public Transit Optimization:** GPS-enabled buses and real-time tracking apps improve reliability.
- Vehicle-to-Everything (V2X) Communication:** Enables vehicles to communicate with each other and with infrastructure.
- Integrated Mobility Platforms:** Combine various transport modes into a single accessible service (e.g., Mobility-as-a-Service or MaaS).

Urban Mobility:

Evolving Needs

Urban mobility is transitioning from car-centric models to more diverse and sustainable options including cycling, walking, electric vehicles (EVs), and shared mobility services like ride-sharing and e-scooters. This evolution is crucial for reducing emissions and improving urban livability.

Smart Mobility

Solutions

• Traffic Congestion Mitigation

Advanced traffic analytics and AI-based control systems help reduce congestion by predicting traffic patterns and dynamically managing flows.

- **Electric and Autonomous Vehicles** EVs reduce pollution and noise, while autonomous vehicles promise enhanced safety and efficiency.
- **Multimodal Integration** Smart platforms enable users to plan trips across multiple transportation modes (e.g., subway + bike-share) with a single app, making public transit more attractive and accessible.
- **Infrastructure Innovations** Smart roads embedded with sensors and wireless charging capabilities for EVs are emerging technologies reshaping urban mobility.

Case Studies

Sinofaport's Smart Mobility 2030 Singapore has implemented an extensive ITS plan featuring ERP (Electronic Road Pricing), smart traffic signals, and autonomous vehicle trials. These efforts aim to optimize traffic flow and encourage public transport use. Barcelona's Mobility Plan Barcelona integrates ITS into its urban planning through smart traffic lights, real-time parking information, and promotion of active transport like cycling and walking.



The Road Ahead

The future of urban mobility lies in fully integrated, user-centric transportation ecosystems that prioritize sustainability and equity. ITS will continue to evolve with advancements in AI, 5G, and IoT, enabling more personalized, efficient, and resilient transport systems. Cities must invest not only in technology but also in policy frameworks and public engagement to ensure inclusive and effective deployment of intelligent transportation systems.

Benefits of ITS and Smart Mobility

- *Reduced Traffic*
- *Lower Emissions and Pollution*
- *Improved Road Safety*
- *Enhanced Public Transport Experience*
- *Data-Driven Decision Making*

Challenges and Barriers

- Costs and Infrastructure Needs
- Privacy and Cybersecurity Risks
- Equity in Access to Technology
- Resistance to Behavioral Change



~ By Mr. Vijay Mane

Smart Cities – The Future of Urban Living

Introduction

In the 21st century, urbanization is accelerating at an unprecedented rate. According to the United Nations, approximately 70% of the global population will reside in urban areas by 2050. This massive demographic shift presents a dual challenge: accommodating population growth while maintaining livable, inclusive, and sustainable environments. One compelling response to this challenge is the development of smart cities—urban areas that harness the power of digital technology to enhance performance, well-being, and economic vitality. A smart city integrates information and communication technologies (ICT) across infrastructure and services to make cities more efficient, responsive, and sustainable.

Core Features of Smart Cities

- **Digital Infrastructure**
- **Smart Governance**
- **Efficient Public Services**
- **Mobility Solutions**
- **Environmental and Sustainability**
- **Public Safety and Security:**

- **Smart Healthcare and Education**

Benefits of Smart Cities

- **Efficiency and Cost Savings:** Automation and data analytics streamline operations, reduce waste, and lower energy consumption, resulting in cost savings.
- **Enhanced Quality of Life:** Residents enjoy cleaner air, safer streets, faster transportation, and better access to services.
- **Economic Growth:** Innovation hubs, tech parks, and digital entrepreneurship flourish in smart cities, attracting investment and creating jobs.

- **Citizen Engagement:** Digital platforms encourage public participation and make governance more inclusive.
- **Sustainability:** Smart technologies help reduce carbon footprints, improve resource use, and enhance environmental resilience.



Global Examples of Smart Cities

Singapore: Known for its Smart Nation initiative, Singapore employs IoT and data analytics in transportation, housing, healthcare, and urban planning. Technologies such as autonomous shuttles, e-payments, and intelligent energy systems are widely deployed. **Barcelona, Spain:** Utilizes smart lighting, digital bus stops, water irrigation sensors, and waste collection systems. The city has embraced open data platforms and citizen engagement tools to foster transparency.

Songdo, South Korea: A planned smart city built from scratch, Songdo integrates ICT in every aspect from waste collection to traffic management offering a model of futuristic urban planning.

Dubai, UAE: Implements AI in governance, smart surveillance, autonomous transport, and blockchain-based services. It aims to become the world's smartest city by 2030.

Challenges in Developing Smart Cities

- **Data Privacy and Security:**

The vast amount of data generated poses risks of breaches and misuse. Robust cybersecurity measures and data protection laws are essential.

- **Digital Divide:** Unequal access to technology can deepen social inequalities. Inclusive planning and digital literacy programs are necessary to bridge this gap.

- **High Costs:** Establishing smart infrastructure requires significant investment. Public-private partnerships and innovative financing models are critical.

- **Interoperability and Standards:** Integrating diverse technologies and systems can be complex without common standards.

- **Resistance to Change:**

Legacy systems, bureaucratic inertia, and lack of awareness may hinder the adoption of smart solutions.



Smart Cities in India

India's Smart Cities Mission, launched in 2015, aims to develop 100 smart cities across the country.

Key projects include:-

Pune: Uses integrated traffic management, public Wi-Fi, and solar rooftops.

Features:- governance, smart roads, and environmental sensors. Surat: Implements real-time flood warning systems and waste management solutions. Despite progress, Indian cities face unique challenges such as high population density, informal settlements, and infrastructure deficits. Tailoring smart solutions to local contexts is key to success.

Conclusion

Smart cities are more than just technology-driven urban centers—they represent a vision of the future where innovation, sustainability, and inclusivity coalesce. By rethinking traditional models of urban development and embracing digital transformation, cities can become engines of prosperity and well-being. However, realizing this vision requires collaborative governance, thoughtful planning, and a commitment to equity. As we stand at the crossroads of rapid urban growth and digital revolution, smart cities hold the promise of a better, more sustainable tomorrow for all.

~By Mr.Suyog Gawai

Green Buildings – Foundations of Sustainable Infrastructure

Introduction

The 21st century is marked by two critical global imperatives: the transition to renewable energy and the modernization of infrastructure. As cities become more densely populated and the effects of climate change more pronounced, integrating renewable energy into smart infrastructure emerges as a pivotal strategy for sustainable development. This synergy not only addresses environmental concerns but also enhances efficiency, resilience, and economic viability.

Renewable Energy: The Backbone of Sustainability

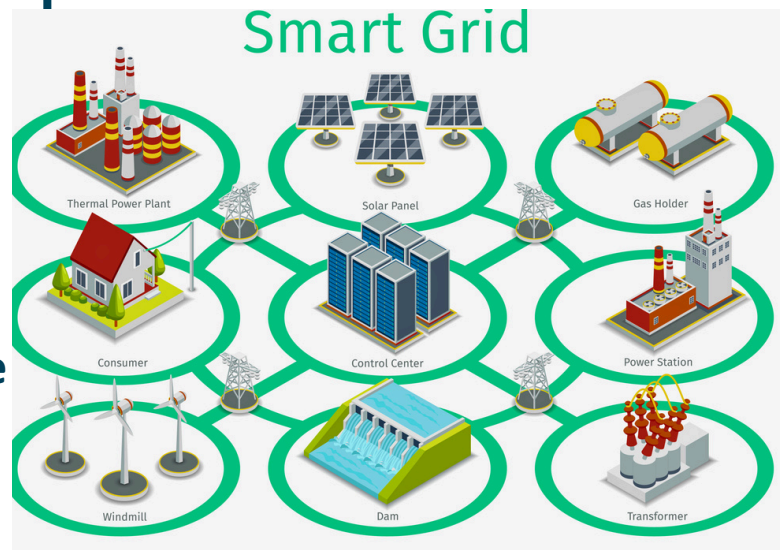
Renewable energy sources such as solar, wind, hydro, and geothermal are rapidly replacing traditional fossil fuels. These sources offer a sustainable, inexhaustible supply of energy that significantly reduces greenhouse gas emissions. Governments worldwide are committing to ambitious carbon neutrality targets, and renewable energy integration is central to achieving these goals. Solar photovoltaic panels on rooftops, wind turbines on urban outskirts, and geothermal systems under city infrastructure are examples of how renewable energy can be embedded within the urban landscape. These installations not only provide clean power but also foster energy independence and local economic development.

Smart Infrastructure: Definition and Components

Smart infrastructure refers to the use of digital technology and data analytics to improve the efficiency, reliability, and sustainability of infrastructure systems. This includes smart grids, intelligent buildings, advanced water management systems, and integrated transportation networks. Key components of smart infrastructure include: **Sensors and IoT Devices**: Monitor and manage performance in real time. **Advanced Data Analytics**: Optimize operations and predict maintenance needs.

Automated Control Systems: Enhance responsiveness and efficiency.

Interconnectivity: Seamless integration across different infrastructure systems.



Integration of Renewable Energy into Smart Infrastructure

The integration process involves embedding renewable energy generation and storage capabilities into the smart infrastructure framework. For example, a smart grid connected to solar panels on residential buildings can dynamically distribute power based on real-time demand and supply.

Energy Storage and Management Batteries and other energy storage technologies play a vital role by balancing supply and demand. Smart infrastructure systems manage energy flow efficiently, ensuring that excess energy generated during peak periods is stored and utilized when demand increases.

Grid Modernization Smart grids are a cornerstone of this integration. They incorporate bidirectional communication between consumers and utilities, enabling demand response, dynamic pricing, and efficient energy distribution.

These buildings utilize renewable sources and are equipped with energy-efficient systems, smart meters, and automation technologies.

Case Studies

• **Masdar City, UAE** Masdar City is a prime example of smart infrastructure integration. It uses solar energy for power, features energy-efficient buildings, and operates on a smart grid. The city showcases how integrated planning and investment can result in a sustainable urban ecosystem.

• **Amsterdam Smart City, Netherlands** Amsterdam employs an intelligent energy system that integrates solar panels, energy storage, and smart grids. The city's commitment to sustainability is evident in its infrastructure, which includes smart lighting, traffic management, and energy-efficient buildings.

Benefits of Integration

Environmental Sustainability : Reduces carbon footprint and promotes conservation.

Economic Efficiency : Lowers energy costs and enhances system performance.

Resilience: Smart systems can adapt to disruptions and recover quickly.

Quality of Life: Improved services, cleaner environments, and reliable utilities.

Challenges and Considerations

Costs Implementation requires significant investment.

• **Interoperability :** Integrating various systems and technologies can be complex.

• **Data Privacy and Security :** Increased connectivity raises cybersecurity concerns.

• **Policy :** Requires supportive legislation and standardization.



Future Outlook

The future of urban infrastructure relies in a seamless blend of renewable energy and smart technologies. Innovations such as AI-driven energy management, blockchain for energy transactions, and next-gen battery storage will further accelerate this transition. Governments, industries, and communities must collaborate to overcome challenges and drive forward the vision of sustainable, intelligent cities powered by clean energy.

~By Mr.Ritesh Molak

ACHIVEMENTS



Dr. Smita Daterao



Civil Engineering department filled two Patents successfully one by Dr. Smita Daterao and another by Prof. Vishwajeet Kadlag along with Prof. Ashwini Waghule.

Prof. Vishwajeet
Kadlag



Prof. Ashwini Waghule



ACHIVEMENTS



Prof. Aniket Nemade from the Civil Engineering Department completed NCC Officers Training at Kamptee on 9th September 2023 and has been commissioned as a Lieutenant in the NCC

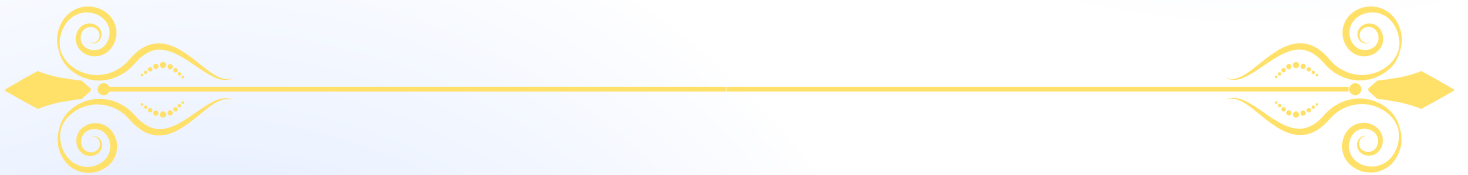


Prof. Sameer Chambulwar successfully completed a 7-week certificate course on “Concrete Structures: Corrosion of Embedded Metal and Reinforcement” offered by the US-based Alison organization



ACHIVEMENTS

Prof. Vishwajeet Kadlag registered a copyright for “Nonlinear Pushover Analysis on RC Frames Considering Soil-Structure Interaction” under the Indian Copyright Office.



Prof. Jitendra Dalvi received Best teacher award for Academic year 2022 – 2023.



HAPPENINGS IN THE DEPARTMENT:

On Eve of “World Paper bag Day” paper bags were distributed to the faculties for usage.

This will promote utilizing the paper bags instead of plastic bags.



Prof. Swapnil Bijwe conducted a lecture on Awareness of NEP 2020 for students in the civil engineering department.

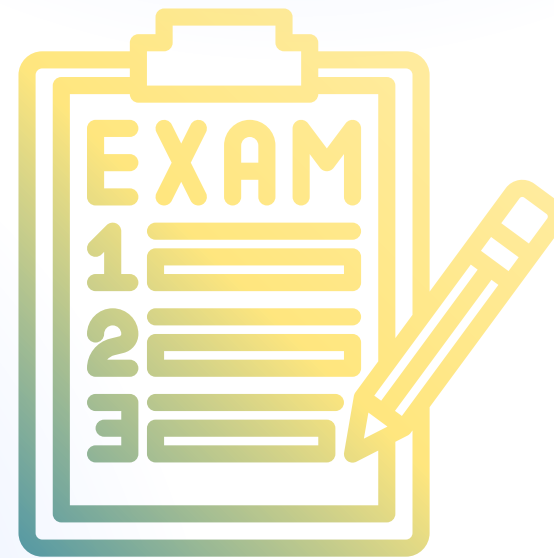
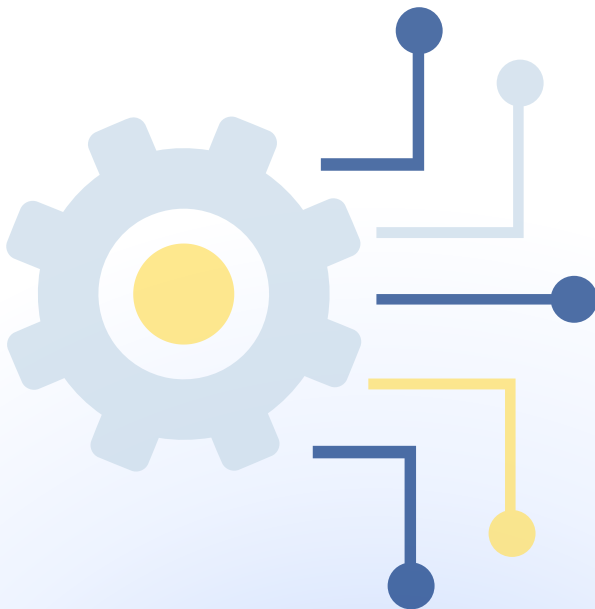


HAPPENINGS IN THE DEPARTMENT:

Civil Engineering student Adarsh Saware (2nd year) was part of Team SF 90, which participated in Smart India Hackathon 2023 at Noida.



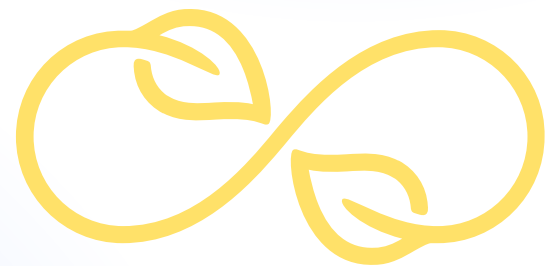
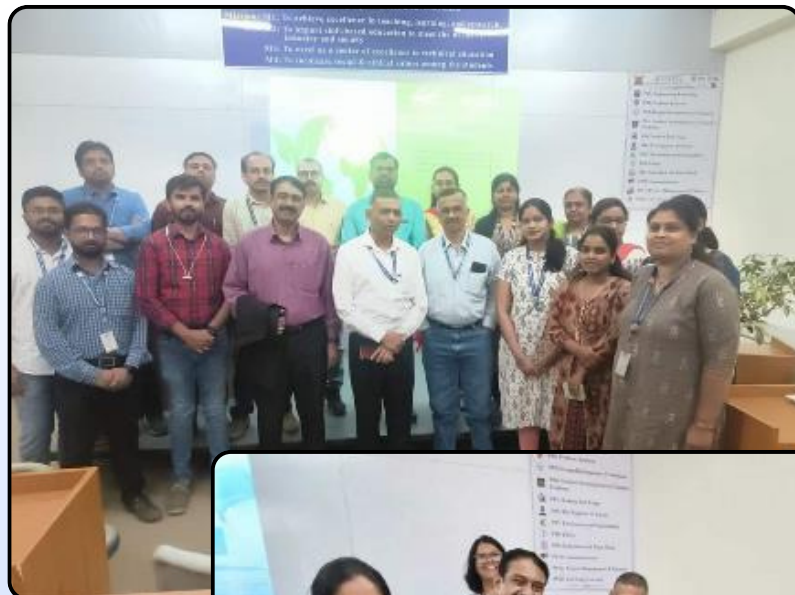
Mr. Adarsh Sawant
(SE Civil Engg.)



Civil Engineering department started competitive exam preparation classes for GATE from 12th September 2023. The batch started with 15 students.

HAPPENINGS IN THE DEPARTMENT:

Alumni Mahesh Dhake gave final year students tips as to how to qualify for NICMAR entrance examination.



Department of Civil Engineering organized an informative session on "Sustainability and Energy Sector Transition"

Under Green Earth Club organized by

Prof. Sarika Thombre.

Resource Person: Dr. Prashant Khankhoje

HAPPENINGS IN THE DEPARTMENT:



Third year class visited Water treatment plant in Military engineering services, Yerwada in Civil engineering department.

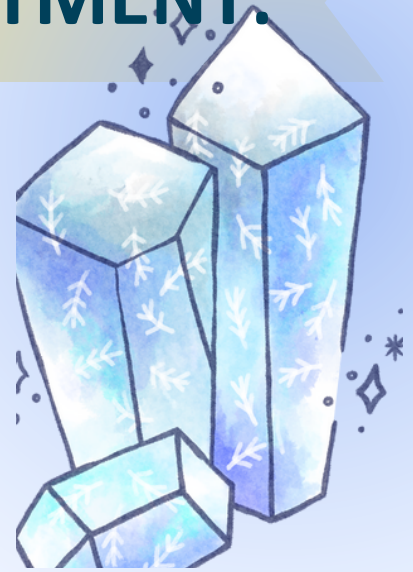
The visit was arranged under practical head of subject “Water supply engineering” by Prof. Arun Sankpal



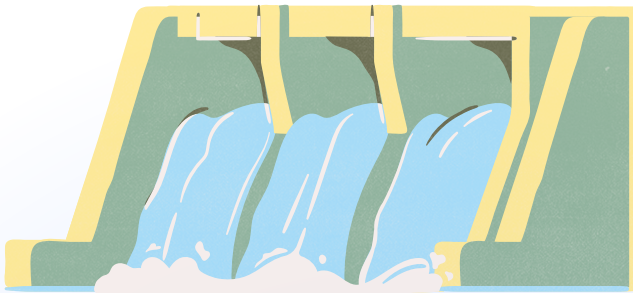
The Civil Engineering Department at Ajeenkya D. Y. Patil School of Engineering organized a guest lecture on “Introduction to LEED Rating System,” coordinated by Dr. Smita Daterao. The session was conducted by Miss Anuradha Gopal, Architect and Sustainability Consultant from Grune Designs, Pune.



HAPPENINGS IN THE DEPARTMENT:



Site visit conducted at Gargoti Museum Sinner by Civil Engineering department for second year students under practical head in “Engineering Geology” subject conducted by Prof Gaytri Sherkar



Site visit conducted at Maharashtra Engineering Research Institute, Nashik by Civil Engineering department for second year students under practical head in “Fluid Mechanics” subject conducted by Prof Uzma Shaikh



HAPPENINGS IN THE DEPARTMENT:

Site visit done by Civil engineering faculties for checking the construction quality in Ajeenkya Tower, Lohegaon.



Prof. Vishwajeet Kadlag attended a "IIC Regional meet 2023" hosted by Dr. D. Y. Patil Vidyapeeth, Pune.



प्रगत बांधकाम साहित्य आणि तंत्रज्ञान

बांधकाम हे कोणत्याही राष्ट्राच्या विकासाचा पाया आहे. पूर्वीच्या काळात दगड, विटा, माती आणि लाकूड यांसारख्या साहित्यांचा वापर करून बांधकाम केले जात होते. मात्र विज्ञान न तंत्रज्ञानाच्या प्रगतीमुळे आता नव्या प्रकारचे साहित्य आणि अत्याधुनिक तंत्रांचा वापर होऊ लागला आहे. हेच प्रगत बांधकाम साहित्य आणि तंत्रज्ञान क्षेत्रातील क्रांतीचे मुख्य कारण आहे. प्रगत बांधकामाची साहित्ये पुढीलप्रमाणे रेडी मिकस काँक्रीट (RNC), फायबर रेनफोर्स काँक्रीट (FRC), ए.ए.सी ब्लॉक्स AAC (Blocks) इत्यादी आजच्या युगातील प्रगत बांधकाम तंत्रज्ञान म्हणजे 3D प्रिंटिंग, प्रीफॅब्रिकेशन, बिल्डिंग इन्फॉर्मेशन मॉडेलिंग (BIM) इत्यादी असून, याच्या वापरामुळे बांधकाम क्षेत्राला खूप चाल जलद गती प्राप्त झाली आहे. भविष्यात बांधकाम क्षेत्रात 'स्मार्ट सिटी' 'ग्रीन बिल्डिंग', आणि 'नेट झिरो' या संकल्पनांचा मोठा प्रभाव राहिल, त्यासाठी अधिक स्मार्ट, ऊर्जा कार्यटनम आणि पर्यावरण स्नेही साहित्य व तंत्राची गरज भासणार आहे.

निष्कर्ष

प्रगत बांधकाम साहित्य आणि तंत्रज्ञानामुळे बांधकाम प्रक्रिया अधिक जलद, सुरक्षित, किफायतशीर आणि पर्यावरण पूरक बनत आहे. भारतासारख्या वेगाने विकसित होणाऱ्या देशात ही तंत्रज्ञाने अधिक प्रभावी ठरत आहेत. भविष्यात यांचा अधिक वापर बांधकाम क्षेत्रात क्रांती घडवून आणू शकतो.

~ By Sahil Taur
(SE Civil Engg.)





-Captured By Kalpesh Sonawane
A colonial dome peeks through leafy shade,
Historic charm meets a campus parade.



~Captured By Suyog Gawai

The majestic Virupaksha Temple bathed in the golden hues of sunset, a timeless marvel of Hampi's rich history.

Riddle

- I arrive without being called,
I make the syllabus look tall.
I bring exams, stress, and fear,
But once I'm gone, students cheer!
Who am I?

retsemeS :rewsnA

- I have branches but no leaves,
no trunk, and no fruit.
What am I?

knaB A :rewsnA

- I'm used in beams and slabs,
To take the tension and load gaps.
I'm made of steel and never seen,
But without me, your structure's lean

rabeR :rewsnA

Civil engineering

R W S P L Q W R Z O H C S B J W I H N Z D M I R
 R R W F N G O D Y E V R U S X U A X Q X I R S W
 C A H N G T G P N R L D V H G Z S N F Z D E F C
 A H Y Y C Y H N Z R S W D K R Z V L B X I H K M
 V J T E S A L A I Q H R E T E M O N I L C N I P
 U N S P S L R P V D K P A E U Q R O T S B G S L
 T S E E H W N W U P L W Y B C E R H H E D T S Z
 I R Z W T T C I K S L O L W N W E O V N R E G F
 L F K P T D I F X F Z A M N M J V V S U E G A N
 Z X E C A O Z O N W Q E M Q G S E B C N S V A X
 U Y D R W B N F Q K W O I H L U L T S Z N Y Z N
 Q L V Q U K Z I P U L L E Y W G U S D I E M T T
 R I K O Q S O N A Q U Y K O D R M V C E C N B C
 M O D E L M S A Y N H W D K E N Z A M R I J M Q
 F N H Z D Y C E J L J Q F E E L N I D R L F A M
 J O Y Y N E S U R Y M S H C R X V R P B O G G N
 F I F W D E G E V P O P T I C S Z E U U P E Y M
 W S K I H R Y P F V C G O X Q M U M Q H O T I Q
 O N S Q L L A I W G G W U W X L D N L M L K H B
 E E Q X V G O U G A N S L H B H G C E G L H B X
 G T T Y Q P A E L T M Q A D A Q G T I D F E N G
 Z L W H Y L P K I I U N K X B P R R N F F X M R
 G Z E P T R R V P X C P I P R Y M S N H O T Y V
 R M Z X D P V G U Y M S K O I R G J V A E U V B

Inclinator
 structure
 Molding
 sector
 model

hydraulics
 Geometry
 Tension
 Survey
 Phase

blueprint
 Pressure
 Optics
 Torque

Newtonian
 license
 Pulley
 Lever