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Concrete Times

Volume 2

Department of Civil Engineering

FROM THE EDITORIAL BOARD

FROM THE EDITORIAL BOARD

It gives us immense pleasure to present ***Concrete Times – Volume 4***, a reflection of the enthusiasm, knowledge, and creativity of the Civil Engineering Department. This magazine is not just a collection of pages, but a compilation of learning experiences, technical understanding, and memorable moments of the academic year.

The aim of this publication is to provide a platform for students to express their ideas, present technical articles, and share innovative concepts related to civil engineering. It also highlights departmental activities such as technical events, site visits, competitions, expert lectures, workshops, and cultural programs that contribute to the overall development of students beyond academics.

The preparation of this magazine has been a valuable journey for the editorial team. From gathering articles and photographs to editing, formatting, and designing each page, the process taught us teamwork, responsibility, and attention to detail. Every contribution from students and faculty members has made this publication meaningful and inspiring.

Civil Engineering is a field that continuously evolves with new technologies, sustainable practices, and innovative construction techniques. Through this magazine, we hope to motivate students to stay curious, think creatively, and apply their knowledge for the betterment of society and infrastructure development.

We sincerely thank the management, Principal, Head of Department, faculty members, and students for their constant support, encouragement, and contributions. Their guidance and cooperation made this publication possible.

We hope that this magazine informs, inspires, and creates lasting memories for all its readers.

Editorial Board

Civil Engineering Department

MESSAGE FROM PRINCIPAL

It gives me great pleasure to present ***Concrete Times – Volume 4***, the departmental magazine of the Civil Engineering Department. A magazine is not merely a publication; it is a reflection of the academic spirit, creativity, and collective efforts of students and faculty members.

I am happy to see the enthusiasm of our students in participating in technical activities, poster presentations, workshops, and various co-curricular programs. Such platforms encourage innovation, improve communication skills, and help students apply theoretical knowledge to real-world engineering challenges. These experiences play a vital role in shaping confident and responsible engineers for the future.

Civil Engineering is the backbone of infrastructure development and nation building. Today's engineers must focus not only on construction but also on sustainability, safety, and smart technologies. I hope this magazine inspires students to think beyond textbooks and contribute positively to society through their technical knowledge and ethical values.

I congratulate the editorial team and Civil Engineering Department for their sincere efforts in compiling this magazine. I also appreciate all students and faculty members who contributed articles, ideas, and support to make this publication successful.

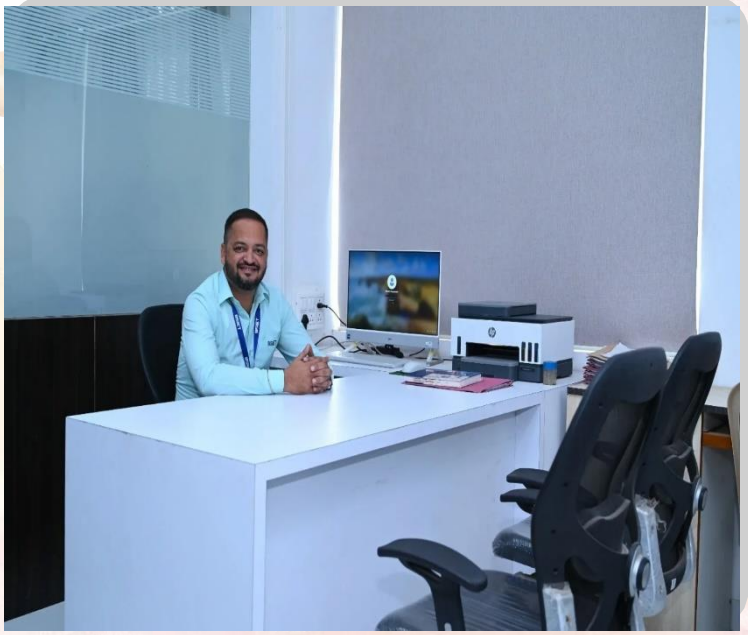
I wish all students a bright future and encourage them to continue learning, exploring, and innovating.

Warm regards,

Mr. V. D. Bhirdi

Principal

MESSAGE FROM HOD



It gives me immense pleasure to present ***Concrete Times – Volume 4*** the departmental magazine of the Civil Engineering Department. This magazine reflects the technical knowledge, creativity, and dedication of our students and faculty members.

Engineering education is not limited to classroom learning. During the academic year, activities such as poster presentations, technical events, site visits, seminars, and project work provided students with practical exposure and helped them understand real-life engineering challenges. Our students actively participated in departmental and technical activities and demonstrated innovative ideas through various presentations and events.

Civil Engineering plays a vital role in the development of sustainable infrastructure and society. Our department continuously encouraged students to develop problem-solving skills, professional ethics, teamwork, and leadership qualities so that they become competent engineers and responsible citizens.

I sincerely appreciate the efforts of the editorial board, faculty members, and students who contributed to this magazine. Their dedication and teamwork made this publication possible.

I wish all students success in their academic and professional careers.

Warm regards,

Mr. R. K. Patil

HOD

OUR VISION

"To provide quality technical education for fulfilling social needs as a civil engineer"

OUR MISSION

•To impart quality teaching, hands on training and value education to students.
•To inculcate professional ethics through quality and modern construction practices.
•To facilitate students for self – employability and pursue career enhancing courses.

PROGRAM OUTCOME'S

PO 1. Basic knowledge: Apply knowledge of basic mathematics, sciences and basic engineering to solve the broad-based Civil engineering problems.
PO 2. Discipline knowledge: Apply Civil engineering knowledge to solve broad-based Civil engineering related problems.
PO 3. Experiments and practice: Plan to perform experiments and practices to use the results to solve broad-based Civil engineering problems.
PO 4. Engineering tools: Apply relevant Civil technologies and tools with an understanding of the limitations.
PO 5. The engineer and society: Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to practice in field of Civil engineering.
PO 6. Environment and sustainability: Apply Civil engineering solutions also for sustainable development practices in societal and environmental contexts.
PO 7. Ethics: Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Civil engineering.
PO 8. Individual and team work: Function effectively as a leader and team member in diverse/ multidisciplinary teams.
PO 9. Communication: Communicate effectively in oral and written form.
PO 10. Life-long learning: Engage in independent and life-long learning activities in the context of technological changes also in the Civil engineering and allied industry.

PROGRAM SPECIFIC OUTCOME'S

PSO1: Civil Engineering Fundamentals
Apply fundamental concepts of civil engineering such as building construction, surveying, structural engineering, transportation engineering, geotechnical engineering, and water resources engineering to solve practical engineering problems.

PSO2: Planning, Design, and Execution
Assist in planning, designing, estimation, and execution of civil engineering projects using standard codes, drawings, and specifications with the help of modern tools and software.

PSO3: Site Practices and Quality Control Perform site supervision, material testing, quality control, and safety practices in construction projects by following standard procedures and professional ethics.

PSO4: Sustainability and Professional Practice Apply sustainable construction practices, environmental considerations, and ethical responsibilities while working in civil engineering projects and professional environments.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1 - Provide socially responsible, environment friendly solutions to Civil engineering related broad-based problems adapting professional ethics.
PEO 2 - Adapt state-of-the-art Civil engineering broad-based technologies to work in multidisciplinary work environments.
PEO 3 - Solve broad-based problems individually and as a team member communicating effectively in the world of work.

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DISCLAIMER

The information presented in *Concrete Times – Volume 2* is compiled and published by the Department of Civil Engineering for academic and informational purposes only. The views, opinions, and technical contents expressed in articles are those of the respective authors and do not necessarily reflect the official policy or position of the institute.

Every effort has been made to ensure the accuracy and reliability of the material published; however, the institute and editorial committee shall not be held responsible for any errors, omissions, or consequences arising from the use of the information contained in this magazine.

All photographs, articles, and creative works included in this publication are used solely for educational purposes. Unauthorized reproduction or commercial use of the content without prior permission from the institute is strictly prohibited.

ABOUT DEPARTMENT

The Department of Civil Engineering is one of the core departments of the institute, committed to providing quality technical education and practical knowledge in the field of infrastructure development. The department focuses on developing competent engineers capable of planning, designing, and executing various civil engineering works such as buildings, roads, bridges, water supply systems, and environmental structures. The department is supported by well-equipped laboratories including Surveying, Geotechnical Engineering, Transportation Engineering, Environmental Engineering, Hydraulics, and Material Testing laboratories. These laboratories provide hands-on experience and help students understand real-world engineering practices beyond classroom learning.

Our dedicated and experienced faculty members continuously guide students through academic learning, project work, and technical activities. The department regularly organizes expert lectures, workshops, site visits, and training programs to enhance practical exposure and professional skills.

In addition to academics, the department encourages students to participate in technical competitions, seminars, social activities, and co-curricular events to develop teamwork, leadership qualities, and communication skills. Through continuous improvement and industry interaction, the department strives to prepare students to become responsible and skilled civil engineers contributing to society and nation building.

ACADAMIC TOPPERS

Class	Rank	Name	Percentage
FY	FIRST	NAIR SHRIDEVI JAYANT	89.57
	SECOND	BANAGE ALAJARIN ADAM	86.71
	THIRD	KAMBLE TEJASWINI SIDHARTH	76..57
SY	FIRST	NAIR SHRILAKSHMI JAYANT	90.00
	SECOND	PATIL VIKAS BHIVAJI	80.53
	THIRD	VATKAR SHREYASH SUDHAKAR	78.87
TY	FIRST	LAKHE PRAKASH MOHAN	84.10
	SECOND	MALI OM ANIL	83.20
	THIRD	PATIL VIGHNESH RAJARAM	82.00

JALLOSH 2K23

JALLOSH 2K23 – ANNUAL DAY CELEBRATION

Jallosh 2K23, the Annual Day celebration of our institute, was organized with great enthusiasm and excitement. The Civil Engineering Department actively participated in this grand cultural event, which provided students a wonderful opportunity to express their talents beyond academics and strengthen unity among peers and faculty members.

The celebration began with the inaugural ceremony in the presence of dignitaries, faculty members, and students. The campus was beautifully decorated and filled with vibrant energy. Students from the Civil Engineering Department contributed significantly to the success of the event through various cultural performances and event management activities.

A variety of programs such as group dance, solo dance, singing performances, drama, and fun activities were organized. Students confidently showcased their artistic abilities and creativity on stage, receiving appreciation from the audience. The participation helped students overcome stage fear and enhanced their communication and presentation skills.

Apart from performances, students also worked in organizing committees such as stage management, decoration, discipline, and coordination. These responsibilities helped them develop leadership qualities, teamwork, planning ability, and time management skills — qualities essential for professional engineers.

The event served as a refreshing break from regular academic routine and promoted interaction among juniors and seniors, creating a friendly and positive environment within the department. Faculty members encouraged and motivated students, making the celebration even more memorable.

The program concluded with prize distribution and appreciation of participants and organizers for their hard work and dedication. Overall, *Jallosh 2K23* was a joyful and memorable experience that strengthened bonding, confidence, and cultural values among students, making it one of the most cherished events of the academic year.

TECHNICAL ARTICLES

TECHNICAL ARTICLE
Hydrolysis in Water and Wastewater Treatment Systems

Mr. M. T. Tirale (Faculty)

Hydrolysis is an important chemical and biological process widely used in environmental and hydraulic engineering, especially in water purification and sewage treatment. The term hydrolysis means the breakdown of complex substances into simpler compounds by reaction with water. In civil and environmental engineering, hydrolysis mainly occurs during wastewater treatment, sludge digestion, and decomposition of organic matter in treatment plants.

In wastewater, organic pollutants such as proteins, fats, oils, and carbohydrates exist in complex molecular form. These compounds cannot be directly decomposed by microorganisms. During the hydrolysis stage, enzymes released by bacteria convert these large insoluble molecules into smaller soluble compounds like amino acids, fatty acids, and simple sugars. This process is the first and most essential step of biological treatment because it prepares pollutants for further biological degradation.

Hydrolysis plays a major role in anaerobic digestion tanks used in sewage treatment plants (STP). In the primary stage of anaerobic digestion, hydrolytic bacteria break down suspended organic solids. After hydrolysis, the next processes — acidogenesis, acetogenesis, and methanogenesis — convert these substances into biogas (methane and carbon dioxide). Therefore, the efficiency of biogas production depends heavily on proper hydrolysis.

The rate of hydrolysis depends on several factors such as temperature, pH, retention time, particle size, and microbial activity. Warm temperature (30°C–38°C) and neutral pH conditions favor faster hydrolysis. Smaller particle size increases surface area, allowing microorganisms to act more efficiently. Inadequate hydrolysis may lead to incomplete treatment, foul odor, and reduced treatment efficiency.

Hydrolysis is also applied in chemical water treatment. Certain metal salts used in coagulation undergo hydrolysis when mixed with water. For example, alum reacts with water and forms aluminum hydroxide flocs. These flocs trap suspended impurities and help in sedimentation. Thus, hydrolysis supports the removal of turbidity, color, and fine particles from drinking water.

In sludge treatment, hydrolysis reduces the volume of solid waste by converting complex solids into liquid form. This improves dewatering and reduces disposal problems. Advanced treatment plants sometimes enhance hydrolysis using thermal, chemical, or mechanical pre-treatment methods to improve digestion efficiency.
Hence, hydrolysis is a fundamental process in environmental engineering that improves treatment efficiency, enhances biogas production, reduces pollution load, and supports sustainable waste management. Understanding and controlling hydrolysis helps civil engineers design efficient water and wastewater treatment systems, contributing to environmental protection and public health.

TECHNICAL ARTICLE

Mr. A. B. Sonalkar (Faculty)

Modern Surveying Using Drone (UAV) & LIDAR Technology

1. Introduction

Surveying is the fundamental step in every civil engineering project. Traditionally, measurements were taken using chain, compass, dumpy level and later total station. However, large-scale infrastructure projects such as highways, railways, smart cities, and irrigation schemes require faster and highly detailed data collection. To overcome limitations of conventional methods, modern surveying has adopted **Unmanned Aerial Vehicles (UAVs) and LiDAR technology**.
During the academic years 2022-2023, drone-based surveying became widely used in construction planning, mapping, quantity estimation, and monitoring works due to its speed, accuracy, and safety.

2. Drone (UAV) Surveying

A **UAV (Unmanned Aerial Vehicle)**, commonly called a drone, is an aircraft controlled remotely and equipped with high-resolution cameras or sensors.

Working Principle

1. The survey area is planned in mapping software.
2. Drone flies automatically over predefined grid paths.
3. Captures hundreds of aerial images.
4. Images processed using photogrammetry software.
5. Generates 2D map and 3D terrain model.

Output Data

- Orthomosaic map
- Contour map
- Digital Elevation Model (DEM)
- Digital Surface Model (DSM)
- Volume calculation

Advantages
• Covers large area quickly
• Reduces manpower requirement
• Safe for hazardous locations
• High visual clarity
• Useful for progress monitoring
Limitations
• Weather dependent
• Requires ground control points for accuracy
• Limited battery time

3. LiDAR Surveying

LiDAR (Light Detection and Ranging) is a laser-based surveying technology that measures distance using reflected laser pulses.
Working Principle
A laser scanner mounted on drone or tripod emits thousands of laser beams per second. The reflected signals are recorded and converted into millions of points called a point cloud.
This produces extremely accurate ground surface models even in forest or uneven terrain.
Advantages
• Very high accuracy (±2–5 cm)
- Works in dense vegetation
- Provides 3D terrain profile
- Useful for highway & river survey

Applications
- Highway alignment
- Canal & dam survey
- Mining volume calculation
- Smart city mapping
- Flood analysis
- Structural inspection

4. Comparison with Conventional Survey

Parameter	Conventional Survey	UAV Survey	LiDAR Survey
Speed	Slow	Fast	Very Fast
Accuracy	Medium	High	Very High
Manpower	More	Less	Very Less
Area Coverage	Small	Large	Very Large
Cost (Large Projects)	High	Moderate	Economical

5. Architectural & Engineering Importance

Modern surveying directly supports architectural planning and structural design:

- Accurate site contour for building layout
- Cut-fill earthwork estimation
- Drainage and slope planning
- Smart city GIS mapping
- Structural deformation monitoring

Thus architects and civil engineers can prepare precise drawings and reduce construction errors.

6. Conclusion

Drone and LiDAR surveying have revolutionized civil engineering measurement techniques. Compared to traditional methods, they provide rapid data collection, high accuracy and better visualization of terrain. With increasing digital construction practices and BIM modeling, modern surveying technologies are becoming essential tools for engineers.

Future engineers must learn these techniques as they represent the next generation of surveying practice.

TECHNICAL ARTICLE

Engineering Mechanics in Civil Engineering Applications

Mr. R. K. Patil (HOD)

1. Introduction

Engineering Mechanics is the fundamental subject in Civil Engineering that deals with the behavior of bodies under the action of forces. Before designing any structure such as a building, bridge, dam, or tower, engineers must understand how forces act and how materials respond to them. The principles of mechanics help in ensuring stability, safety, and durability of structures.

Engineering mechanics is mainly divided into two parts: **Statics** and **Dynamics**. Statics deals with bodies at rest, while Dynamics deals with bodies in motion. Most civil engineering structures are analyzed under statics because structures are expected to remain stable under different loads.

2. Types of Forces Acting on Structures

In civil engineering, structures are subjected to different types of forces:

- Dead Load – Self-weight of structure
- Live Load – Moving loads such as people, vehicles, furniture
- Wind Load – Pressure due to wind
- Earthquake Load – Dynamic vibration forces
- Water Pressure – Hydrostatic forces in dams and tanks

3. Free Body Diagram (FBD)

A Free Body Diagram is the most important tool in mechanics. It represents all forces acting on a body after isolating it from surroundings. Engineers draw FBD before solving reactions in beams, trusses, or frames.

Steps:

1. Isolate the structure
2. Show support reactions
3. Apply loads
4. Solve equilibrium equations

6. Centroid and Centre of Gravity

The centroid is the geometric center of an area, and centre of gravity is the point where total weight acts. These concepts help in:

• Column stability
• Structural balancing
• Load distribution
• Design of foundations

7. Practical Applications in Civil Engineering

Engineering Mechanics is used in almost every civil engineering activity:

• Determining support reactions in beams
• Analysis of trusses and frames
• Stability of dams and retaining walls
• Design of foundations
• Analysis of lifting machines and cranes

8. Conclusion

Engineering Mechanics forms the backbone of structural analysis and design. Without understanding forces, equilibrium, and moments, safe construction is impossible. Every civil engineering structure stands successfully only because mechanical principles ensure stability and strength. Therefore, mastering engineering mechanics is essential for every civil engineer to design reliable and safe infrastructure.

PHOTO GALLERY


WOMEN'S SELF PROTECTION
GPS Map Camera
Kolhapur, Maharashtra, India
246/A/1, Nagalapark, Kolhapur, Maharashtra 416003, India
Lat 16.713453°
Long 74.238144°
13/03/23 02:05 PM GMT +05:30
Google


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DR. BAPUJI SALUNKHE INSTITUTE OF ENGINEERING AND TECHNOLOGY (POLYTECHNIC)
BSiET
LIFE SKILLS DEVELOPMENT TRAINING
11th to 13th May 2023
Guest Speaker
Ms. Shamli Powar
Ms. Pragnya Durgai
Consultant Trainer


BSiET
GPS Map Camera
Kolhapur, Maharashtra, India
246/A/1, Nagalapark, Kolhapur, Maharashtra
416003, India
Lat 16.713423°
Long 74.238156°
27/03/23 10:14 AM GMT +05:30
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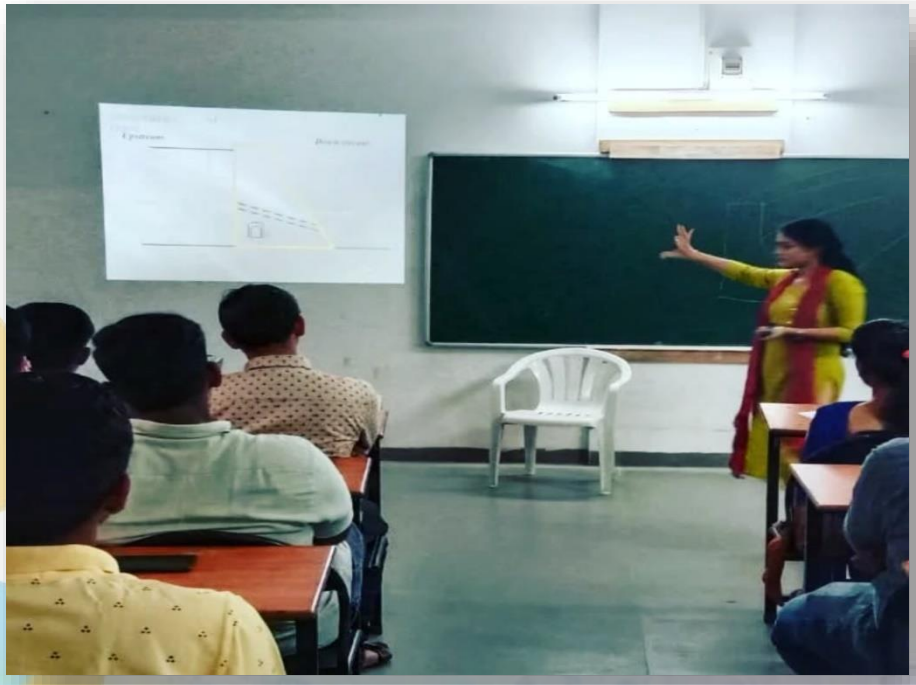
Expert Lecture
Tech.
(ACC)


Expert Lecture
on
Resource Engineering



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