DEPARTMENT OF CIVIL ENGINEERING

Innovations by faculty in teaching and learning

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The institute uses student-centered teaching methods to provide quality technical education. These include hands-on learning, group activities, interactive sessions, project work, and problem-solving tasks. Such methods are used both inside and outside the classroom to make learning more engaging and meaningful. This approach helps students take an active part in the learning process, improves their creativity, and builds their ability to solve real-world problems.

Smart classrooms, virtual classrooms, audio-visual equipment, and other ICT facilities are well-equipped at the college and are frequently used by teachers in daily instruction to engage students in the subject. Students' engagement in group discussions, tests, and seminars encourages interactive learning. Eminent academics give special lectures on subjects relating to the curriculum to enhance the learning opportunities for the students further.

The main aim of the teaching-learning process is to help students gain the knowledge and skills needed as per industry and academic standards. Faculty members use different innovative teaching methods to create the best learning environment for students. These practices are listed in **Table 5.5**.1

Table 5.5.1: Summary of Innovative Teaching techniques in the Teaching Learning Process

Sr.No	Teaching Learning Methods	Mode of Teaching/Learning Process	Outcome
1	ICT Class Room	Live Demonstration using Software Tools/Video	Easy to Understand the concept
2	E-Learning	NPTEL, MOOCs (Massive Open Online Course)	Enhance the learning experience, using audio-visual aids. On tip compatibility & resources
3	Presentations	LCD Presentation	Enrich Subject Knowledge and Improve Presentation Skills.
4	Assignment Practices	Preparation	Improving the Cognitive Skills
5	Technical Events	Competition	Enhance the Technical Skill
6.	Self-Learning Sessions	SLS sessions are added in the academic timetable so that	Clears the Doubts in the Class itself

		students are actively involved in academic study.	
7.	Webinars, workshops, Symposiums and Exhibitions	Online / offline	Develops the skills, improves the connectivity, and Gains cutting-edge technology knowledge
8	Virtual Labs	Online mode of Practical Conductions	Able to do the Practical's according to specific courses through virtual platform from IIT Bombay.
9.	Use of Digital Library	Availability of e-Books, e-journal, e-shodhganga, e-shodhsindhu, e-pathshala,Moodle service etc.	Helpful to enhance the knowledge.
10	Quiz	Presentation	To test the student understanding level at the end of course topic

Faculty members actively utilize Information and Communication Technology (ICT) tools to enhance both classroom and laboratory learning, making the teaching-learning process more engaging and effective. Traditional methods are supplemented with modern ICT resources, reflecting the institute's commitment to continuously improving the academic experience.

Table Innovative practices/innovations undertaken by the faculty

Sr.No	Innovativepractices/ innovations	Name of the faculty	Subject /Goal	Context
1	**You tube channel Name: The transport tech hub Link: https://youtube.com/@thetransporttechhub-1234?si=uzQlrO2kz1Ps3l1R**	Mrs. Hindola Saha	Concept of TRE practical & oral clearing videos	Beneficial for Slow learners
2	**You tube channel Name: IWRPM2019PATTERN Link: https://www.youtube.com/@IWRPM2019Pattern**	Mrs. Sarika Raosaheb Burle	Concept of IWRPM and Oral question,answers course centric videos for students	IWRPM simplifies for students with clear concepts, Oral question_Answer Sessions and real-world insights from theory to experiments.
3	**You tube channel Name: @aniketnemade3819 Link**: https://www.youtube.com/watch?v=STvrlxG5m1Y	Lt. Aniket Vilas Nemade	Mechanics of structure numericals : Course-centric videos for students	Beneficial for Slow learners
4	**You tube channel Name- Whaterology Link**: https://www.youtube.com/channel/UCp0eCYke__hSNQFxd6sBS9Q	Ms. Uzma Shaikh	Concept -clearing, fluid mechanics course centric videos for students	Whaterology simplifies Fluid Mechanics for students with clear concepts, lab demos, and real-world insights from theory to experiments,

				all in one place!
5	**Whatsup Group Name- IPR (Intellectual Property rights) Cell Group Link-** https://chat.whatsapp.com/Dj34oOyqdxA3BBdRgjwiKh?mode=ac_t	Mr. Vishwajeet Ashok Kadlag	To make awareness among all age groups people regarding Intellectual Property rights	College students and faculty members gets new idea on various social issues and product development for the same

The primary goal of faculty-driven innovations in teaching and learning within the Civil Engineering Department is to continuously enhance pedagogical effectiveness and student engagement. By integrating advanced technological tools, adopting interactive teaching methodologies, and fostering a participative learning environment, the department aims to improve students' conceptual understanding, critical thinking, and practical skills. These initiatives are designed to create a dynamic and inclusive educational atmosphere that prepares students to meet the evolving demands of the civil engineering industry and to promote lifelong learning. Ultimately, the department strives to achieve excellence in teaching standards, ensure active student involvement, and support overall academic and professional development.

List of Initiatives in the teaching and learning process followed by the department:

1. **Student Chapter activities:**

Student chapter activities such as those organized by ISTE (Indian Society for Technical Education), IGS (Indian Geotechnical Society) and IGBC (Indian Green Building Council) Student Chapters play a vital role in enriching the academic and professional development of civil engineering students, which aligns with NBA accreditation criteria. The significance of these activities includes:

a. . **Promotion of Industry-Academia Interface:** These chapters facilitate interactions with industry professionals, experts, and academicians, providing students with exposure to real-world challenges and current industry trends.
b. **Enhancement of Technical Skills**: Activities such as workshops, seminars, technical competitions, and training programs help students develop practical skills, innovative thinking, and problem-solving abilities essential for their future careers.
c. **Fostering Leadership and Soft Skills:** Student chapters encourage leadership development, teamwork, communication skills, and professionalism through organizing events and participating in national/international competitions.
d. **Encouraging Research and Innovation:** These platforms provide opportunities for students to engage in research projects, publish papers, and participate in technical debates, thereby promoting a culture of innovation.
e. **Creating a Learning Community:** Active participation in chapter activities builds a vibrant academic community that motivates students, enhances their learning experience, and prepares them for lifelong learning and professional growth.

Sr. No	Student Chapter	Faculty Adviser
1	ISTE (Indian Society for Technical Education) Student Chapter	Ms. Shraddha Khandare
2	IGS (Indian Geotechnical Society)Student Chapter	Ms. Shraddha Khandare
3	IGBC (Indian Green Building Council) Student Chapter	Mr. Gaurav Vispute

Outcome: Enhanced technical knowledge and practical skills relevant to civil engineering. Developed leadership, teamwork, and communication abilities through active participation.

2. **Use of Animations/PPTs/CASE studies:**

In order to boost students' interest and level of learning, professors in certain subjects use animations, PPTs, and case studies. The primary objective is to capture students' attention and reinforce their knowledge.

Outcome: Students can gain a better understanding of the concepts.

3. **E content on YouTube:**

Faculty members created their own You Tube channels, where they post study materials related to their specific subjects. The links are shared with students, and the content is accessible to all.

Outcome: It contributes to student's knowledge and opportunity for self-study.

4. **LCD/ Projector/Smart Class Room:**

In the Department of Civil Engineering, significant emphasis is placed on integrating innovative teaching methodologies to enhance the learning experience. All classrooms are equipped with modern teaching aids, including LCD projectors, green boards, and whiteboards. Faculty members actively utilize these tools to deliver engaging and effective presentations.

Beyond traditional lectures, faculty foster an interactive learning environment by encouraging students to participate in group discussions, team-based activities, and presentations. These innovative approaches aim to elevate the quality of teaching and promote active student engagement, thereby supporting the department's commitment to excellence in teaching and learning.

Outcome: Enhanced learning experiences through the integration of LCD projectors and smart classrooms, facilitating interactive and multimedia-based teaching.

5. **Project Based Learning:**

To implement Project-Based Learning (PBL) as a student-centered pedagogy aimed at motivating SE students to engage in cooperative group work to solve real-world problems.

PBL is a dynamic classroom strategy where students acquire deeper knowledge through active exploration of complex questions, challenges, or problems over time. This inquiry-based and active learning style shifts the teacher's role to that of a mentor, guiding students through the learning process.

Students will work collaboratively in groups to investigate and respond to real-world challenges, applying their knowledge and skills to develop practical solutions. This approach fosters critical thinking, problem-solving, and creativity, aligning with the NBA's emphasis on innovation and teamwork.

Sr No	Academic Year	Link
1	2024-2025	https://www.facebook.com/share/p/18JpxxAHTi/
2	2023-2024	https://www.instagram.com/reel/C6Idx60o_HW/?igsh=aWpwOW9zN29iaHVo

Outcome:
Students will develop effective teamwork and interpersonal skills. Engaging with real-world challenges will sharpen students' analytical skills, enabling them to devise innovative solutions.

6. Schedule of Virtual classroom lectures on Microsoft Teams/Google for Syllabus completion:

Sr No	Academic Year	Faculty Name	Subject	Link
1	2024-2025	Mrs. Sheetal Dipak Marawar	QSCT	https://teams.microsoft.com/l/meetup-join/19%3ameeting_YjhiM2M3OWItZGQyNy00MThlLTg5YzctMjQyM2I0YzM0NjQx%40thread.v2/0?context=%7b%22Tid%22%3a%2213817675-036e-4ca3-ba1c-d69032c5d0a0%22%2c%22Oid%22%3a%2256a40612-fbee-487c-9a72-e98d1a4a016f%22%7d
2	2024-2025	Mr. Vishwajeet Asok Kadlag	RM & IPR	https://meet.google.com/mqw-tgbs-pmc
3	2024-2025	Mr. Gaurav Chandrakant Vispute	APC	https://meet.google.com/hax-yvhp-sso
4	2024-2025	Mr. Shreedhar Deepak Patil	BTAP	https://meet.google.com/nec-vvya-nzv?hs=122&authuser=0
5	2024-2025	Mrs. Hindola Saha	TRE	https://teams.microsoft.com/l/meetup-join/19%3a33aff60958b44bd4821776a4c52b7b8c%40thread.tacv2/1727335413615?context=%7b%22Tid%22%3a%2213817675-036e-4ca3-ba1c-d69032c5d0a0%22%2c%22Oid%2

				2%3a%2297926e2c-e4b0-415b-ba63-7153dd914374%22%7d
6	2024-2025	Mrs. Sarika Raosaheb Burle	Elective IV-ID	https://teams.live.com/meet/9343693596034?p=jRBLCArhN9GngIYp1S
7	2024-2025	Dr. Aakanksha Arun Ingle	Transporat ation Enginerrin g	https://teams.microsoft.com/l/meetup-join/19%3ameeting_YzAwNmRlMDMtOTRlNC00NzBkLWE1NjgtNzI4NjYyMjQ3Mjkz%40thread.v2/0?context=%7b%22Tid%22%3a%2213817675-036e-4ca3-ba1c-d69032c5d0a0%22%2c%22Oid%22%3a%2288593be0-f14f-4470-8fed-b1ddde8478ea%22%7d
8	2021-22	Lt. Aniket Vilas Nemade	Mechanics of structures	https://teams.microsoft.com/l/meetup-join/19%3apM7x2uz8nG54TZJEWXi61xunLhvqDno8SMRA8hirJrw1%40thread.tacv2/1629951748064?context=%7b%22Tid%22%3a%2213817675-036e-4ca3-ba1c-d69032c5d0a0%22%2c%22Oid%22%3a%22dc8b05ec-98a3-4756-a2f1-65002d37a9e7%22%7d
9	2021-22	Ms. Uzma Shaikh	Fluid Mechanics	https://teams.microsoft.com/l/meetup-join/19%3aaebade4866b24c159917e8883541d748%40thread.tacv2/1640841483270?context=%7b%22Tid%22%3a%2213817675-036e-4ca3-ba1c-d69032c5d0a0%22%2c%22Oid%22%3a%22a572ae4d-6ed4-4ae4-bed7-b066bd61c159%22%7d

A. The work must be available for peer review and critique.

In accordance with the requirement that the work must be available for peer review and critique, we have taken the necessary steps to ensure that the submitted material is accessible to relevant reviewers and academic peers.

The complete work has been uploaded to the designated section of the institute official website/repository, where it can be reviewed by authorized users. Proper access permissions have been configured to allow faculty members, domain experts, and other designated reviewers to view, comment, and provide constructive feedback on the content.

We strongly believe that peer review is a vital process that enhances the quality, accuracy, and academic integrity of the work. We welcome critiques, suggestions, and recommendations from the reviewing committee or subject experts, as this input will be instrumental in refining the final version.

Additionally, we are open to scheduling a formal review meeting or an open discussion forum (if required) where peers can raise their observations and contribute to the improvement of the work. All feedback received will be duly acknowledged and incorporated wherever relevant and appropriate.

The work will remain accessible throughout the review period and that all necessary support will be extended to facilitate a transparent and constructive critique process.

B. Work Must Be Reproducible and Further Developed by Other Scholars

The work has been designed to be fully reproducible and well-documented, allowing other scholars to verify the results and build upon it in future research. All relevant data, methods, and tools have been made available to ensure transparency and ease of further development.

C. Statement of Clear Goals, Use of Appropriate Methods, Significance of Results, Effective Presentation, and Reflective Critique

The institute is known for its commitment to excellence in teaching and learning. The teaching-learning process is continuously improved based on regular feedback from all stakeholders, including students, faculty, and industry representatives.

Clear academic goals are set at the beginning of each semester, and the content delivery, teaching methods, and evaluation strategies are carefully planned in advance. A combination of traditional and student-centered approaches is adopted, such as Project-Based Learning (PBL), Value Addition Programs (VAPs), and blended learning methods. These approaches help make the learning experience more engaging, practical, and outcome-oriented.

Advanced learners are encouraged to push their creativity and innovation through various platforms like competitions, research projects, and innovation cells. Meanwhile, slow learners are identified early and provided with additional support through remedial coaching, mentoring, and personalized attention.

The institution also places strong emphasis on inclusivity, ensuring that the diverse needs of students from different backgrounds are met. Regular online student satisfaction surveys are conducted to gather feedback on teaching quality, course content, and learning support. This feedback plays a critical role in reviewing and refining teaching practices and academic planning.

By integrating feedback, clear goals, appropriate methodologies, and ongoing reflection, the institute ensures that the educational process remains effective, inclusive, and continuously evolving to meet the expectations of learners and academic standards.

Implementation of student-centric methods:

By implementing student-centric methods, educators can create an engaging and inclusive learning environment that promotes active learning, critical thinking, and the development of practical skills, resulting in enhanced teaching-learning experiences.

1.Experiential learning: focuses on active engagement and hands-on experiences to

facilitate deep understanding and knowledge retention. It involves practical applications of concepts and learning through real-world experiences. To implement experiential learning, we are conducting;

a. Incorporate industrial visit or site visits related to the subject matter to provide real-world context and practical exposure.

b. Use simulations, role-playing, or case studies to simulate real-life scenarios and encourage students to apply their knowledge in problem-solving.

c. Encourage project-based learning where students work on extended projects that require research, experimentation, and application of concepts in a practical setting.

d. Integrate technology tools and virtual reality experiences to create immersive learning environments.

2. Participative Learning: Participative learning emphasizes active student involvement in the learning process, encouraging collaboration, discussion, and peer-to-peer interaction. It fosters critical thinking, communication skills, and teamwork. To implement participative learning, we are conducting;

a. Incorporate group activities, discussions, and debates to encourage students to share their ideas, perspectives, and insights.

b. Use cooperative learning strategies, such as group projects or problem-solving tasks, where students work together to achieve common goals.

c. Facilitate classroom discussions by asking open-ended questions and encouraging students to express their thoughts, ask questions, and challenge assumptions.

d. Utilize online platforms or learning management systems to promote online discussions, forums, and collaborative projects.

3. Problem-Solving Methodologies: Problem-solving methodologies focus on developing students' analytical and critical thinking skills by engaging them in solving real-world problems. It encourages creativity, innovation, and a proactive approach to learning. To implement problem-solving methodologies, we are following;

a. Present authentic and challenging problems that require students to analyse, evaluate, and devise solutions using their knowledge and skills.

b. Encourage students to ask questions, explore multiple perspectives, and think critically to identify the underlying issues and develop effective solutions.

c. Provide opportunities for students to work individually or in groups to brainstorm ideas, analyse alternatives, and evaluate the potential impact of their solutions.

d. Offer constructive feedback and guidance throughout the problem-solving process to help students refine their approaches and learn from their experiences.