Department of Civil Engineering

Highlights

Faculty Corner

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THE VISION OF GMRIT

- To be among the most preferred institutions for engineering and technological education in the country.
- An institution that will bring out the best from its students, faculty, and staff – to learn, to achieve, to compete and to grow – among the very best.
- An institution where ethics, excellence and excitement will be the work religion, while research, innovation and impact, the work culture.

THE MISSION OF GMRIT

- To turnout disciplined and competent engineers with sound work and life ethics.
- To implement outcome-based education in an IT-enabled environment.
- To encourage all-round rigor and instill a spirit of enquiry and critical thinking among students, faculty, and staff.
- To develop teaching, research, and consulting environment in collaboration with industry and other institutions.

DEPARTMENT VISION

- To be a preferred department of learning for students and teachers alike, with dual commitment to Academic and Research, and serving students in an atmosphere of innovation and critical thinking.

DEPARTMENT MISSION

- To provide adoptable education for the graduates in preparing them for a rewarding career to develop academic and research in collaboration with industry and other institutions in the field of Civil Engineering. (M1)
- To prepare the students as thinking professionals and good citizens who will be able to apply their knowledge critically and innovatively in solving contemporary professional and social problems.(M2)

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO 1: Graduates with ability to solve core engineering problems through continuous self-paced learning in tune with changing technologies.

PEO 2: Reinforce engineering skills, critical thinking and problem-solving skills in professional engineering practices and deal with socio-economical, technical and business challenges.

PEO 3: Nurture professionalism with soft skills, managerial & leadership skills and ethical values.

PROGRAM OUTCOMES (POS):

Engineering graduate will be able to:

PO 1: Apply the knowledge of basic sciences and fundamental engineering concepts in solving civil engineering problems (**Engineering knowledge**)

PO 2: Identify and define civil engineering problems and investigate to analyze and interpret data to arrive at substantial conclusions. (**Problem analysis**)

PO 3: Propose appropriate solutions for engineering problems complying with functional constraints such as economic, environmental, societal, ethical, safety and sustainability in accordance with Indian standard codes of practices. (**Design/development of solutions**)

PO 4: Perform investigations, design and conduct experiments, analyze and interpret the results to provide valid conclusions. (**Conduct investigations of complex problems**)

PO 5: Select/develop and apply appropriate techniques and IT tools to analyze, design and scheduling of activities with an understanding of the limitations and successfully implement and adopt to technological changes in civil engineering with intervention of IT industries (**Modern tool usage**)

PO 6: Give reasoning and assess societal, health, legal and cultural issues with competency in professional engineering practice. (**The engineer and society**)

PO 7: Demonstrate professional skills and contextual reasoning to assess environmental/societal issues for sustainable development. (**Environment and sustainability**)

PO 8: Demonstrate knowledge of professional and ethical practices. (**Ethics**)

PO 9: Function effectively as an individual, and as a member or leader in diverse teams, and in multi- disciplinary situations. (**Individual and team work**)

PO 10: Communicate effectively with respect to oral, written and graphical communication (**Communication**)

PO 11: Demonstrate and apply engineering & management principles in their own / team projects in multidisciplinary environment. (**Project management and finance**)

PO 12: Recognize the need for, and have the ability to engage in independent and lifelong learning. (**Life-long learning**)

PROGRAM SPECIFIC OUTCOMES (PSOS):

Engineering graduate will be able to:

PSO 1: Demonstrate the quality and suitability of construction materials (**Program Specific**)

PSO 2: Ability to apply the practical aspect of analysis, design and safe construction practices (**Program Specific**)

OVERVIEW

The Department of Civil Engineering was established in 2002. It offers students a solid grounding in better utilization of resources and greater standardization of construction processes required by the construction industry. Students are taught how to use and employ innovative design methods and techniques. Exposure to contemporary facets planning, construction design and project management are key aspects of the course. Annual intake of this Department is 120 students.

Faculty Corner

CONSULTANCY

Being facilitated with well-equipped equipment and laboratories the Department of Civil Engineering always contributes a major role in the consultancy works offered to the government and private organizations around the districts and so on.

As a part of Consultancy an amount of 46200/- rupees worth core related works were carried out by the faculty with respect to various specializations.

NATIONAL & INTERNATIONAL JOURNALS

1. Gokulan R, et.al., "Investigation of Copper Ion adsorption using Activated Sawdust Powder: Isotherm, Kinetic and Thermodynamic studies", Global NEST Journal, October 2022. *(Impact Factor: 1.04, SCIE and Scopus Indexed, SJR: Q3)*
2. Gokulan R, et.al., "Ziziphus Jujube Seeds derived Biomass as Cost-Effective Biosorbent for the removal of Cr6+ from Aqueous solutions: Isotherm and Kinetic Studies", Global NEST Journal, November 2022. *(Impact Factor: 1.04, SCIE and Scopus Indexed, SJR: Q3).*
3. Gokulan R, et.al., "Studies on Influence of Process Parameters in Upgradation of Bio-oil Derived from HTL of Domestic household waste: Application of Response Surface Methodology", Global NEST Journal, October 2022. *(Impact Factor:1.04, SCIE and Scopus Indexed, SJR: Q3)*
4. Naga Siva Pavani Peraka et.al., “Stakeholder-Oriented Optimization of Pavement Maintenance Interventions Using Multi-Criteria Decision-Making Approach”, International Journal of Pavement Research and Technology, January 2023. *(Impact Factor:1.66, Scopus Indexed, SJR: Q2)*
5. Sridhar Jayaprakash, et.al., “Evaluation of Artificial Neural Network Predicted Mechanical Properties of Jute and Bamboo Fiber Reinforced Concrete Along with Silica Fume”, Journal of Natural

Fibres, Vol. 20, No. 1, pp.20, January 2023. *(Impact Factor:3.50, SCIE and Scopus Indexed, SJR: Q1)*

6. Sridhar Jayaprakash, et.al., "Influence of Slag-Based Geopolymer Concrete on the Seismic Behavior of Exterior Beam Column Joints", Sustainability, No.15,pp 15 pages, January 2023. *(Impact Factor:3.889, SCIE and Scopus Indexed, SJR: Q1)*
7. Gokulan R et.al. "Biodecolorization of Reactive Red 120 in batch and packed bed column using biochar derived from Ulva reticulata", Biomass Conversion and Biorefinery, 2023. *(Impact Factor:4.05, SCIE and Scopus Indexed, SJR: Q2)*
8. Vijayakumar A. et.al," Biochar derived from Caulerpa scalpelliformis for the removal of Reactive Yellow 81 in batch and packed bed column, Biomass Conversion and Biorefinery, 2023. *(Impact Factor:4.05, SCIE and Scopus Indexed, SJR: Q2)*
9. Praveen Saravanan et.al. "Batch Studies of Turquoise Blue Dye (TB) Adsorption onto Activated Carbon Prepared from Low-Cost Adsorbents: An ANN Approach" Biomass Conversion and Biorefinery, February 2021. *(Impact Factor:4.05, SCIE and Scopus Indexed, SJR: Q2)*
10. Sridhar J, et.al, "Prediction of the Mechanical Properties of Fibre-Reinforced Quarry Dust Concrete Using Response Surface and Artificial Neural Network", Advances in Civil Engineering,Vol.2023, 13 Pages, January 2023. *(Impact factor:1.843, SCIE and Scopus Indexed, SJR: Q2)*

CONFERENCE PRESENTATION

- Giri, J.P et.al.," Utilization of Different Supplementary Cementitious Materials and Recycled Concrete Aggregate for Stabilization of Pavement Base Layer", Proceedings of Indian Geotechnical and Geoenvironmental Engineering Conference (IGGEC) 2021, Vol. 2. IGGEC 2021. Lecture Notes in Civil Engineering, vol 281. Springer, Singapore. *(Scopus Indexed, SJR: Q4)*

ONLINE COURSE COMPLETION

- Mr.Penki Ramu has completed 04 weeks online course on "3D Printing" on 29-Dec-2022, certified by MSME-Technology Development Centre (Process & Product Development Centre, Agra), Ministry of MSME, Govt. of India Society; MSME-TDC, EC-Thiruvalla (Kerala).
- Mr. G Madhava Krishna Reddy has completed 01 week online course on "Introduction to Data Analytics" on 13th Feb 2023, certified by Skillup by Simplilearn.

PARTICIAPTIONS

- Mr. Siva Ramakrishna attended a 7 days STTP on "Publications, Projects and Patents (PPP2K22)" conducted by CVR college of Engg, Hyderabad between 28th November and 4th December 2022.
- Mr. B.P.R.V.S.Priyatham attended a 5 days FDP on "Future Developments in Civil Engineering" conducted by Anand International College of Engineering, Jaipur between 06-02-2023 to 10-02-2023.
- Mr. K. Naga Rajesh attended a 5 days FDP on "Future Developments in Civil Engineering" conducted by Anand International College of Engineering, Jaipur between 06-02-2023 to 10-02-2023.

Student Corner

ACHIEVEMENTS

A team of three students from Civil Engineering participated AFOSEC-2023 at VR Siddhartha College of Engineering and own a cash prize of Rs 11000 in various events.Telangana.

PARTICIPATIONS

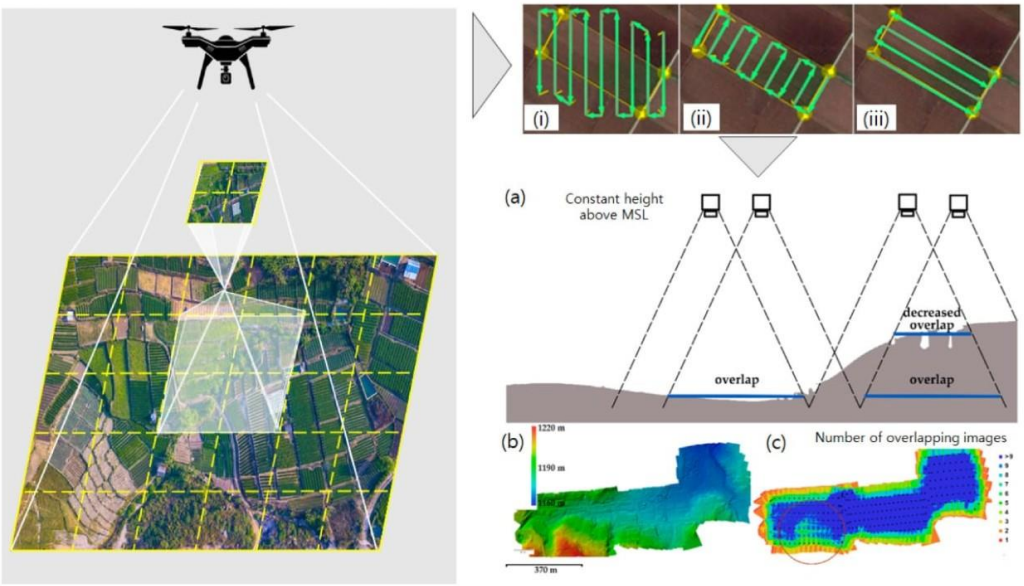
- 35 Number of students attended a technical event "Pop the Question" on 01-Feb-2023, conducted by GMR Institute of Technology in association with Indian Society for Technical Education (ISTE).
- 14 Number of students attended a technical event "Panel Discussion" on 15-Feb-2023, conducted by GMR Institute of Technology in association with Indian Society for Technical Education (ISTE).

TECHNICAL NOTE

Applications of Drones in Civil Engineering

Drones, or unmanned aerial vehicles (UAVs), have become indispensable tools in civil engineering, transforming traditional methods of surveying, construction, and infrastructure management. Their ability to capture high-resolution aerial imagery and perform tasks with precision and efficiency has revolutionized various stages of engineering projects. One of the primary applications of drones in civil engineering is site surveying and mapping. Equipped with advanced cameras and LiDAR sensors, drones can generate detailed topographic maps, 3D models, and orthomosaic images, providing engineers with accurate site data in significantly less time than traditional methods. In construction management, drones are used for progress monitoring, enabling project managers to oversee large construction sites and track milestones in real time. This visual documentation helps in identifying delays, ensuring safety compliance, and maintaining quality control. Additionally, drones play a crucial role in bridge inspections, road condition assessments, and structural health monitoring. By capturing data from hard-to-reach areas, drones reduce the need for manual inspections, enhancing safety and reducing costs.

Drones also support disaster management and post-disaster assessment in civil engineering projects. After events like earthquakes or floods, drones can quickly survey damaged infrastructure and provide data for planning reconstruction efforts. In addition, drones are instrumental in environmental monitoring, such as analyzing land erosion, tracking deforestation, and assessing the impact of construction projects on surrounding ecosystems. 3D printing of concrete, also known as additive manufacturing for construction, is an innovative technology that involves using a specialized 3D printer to deposit layers of concrete in precise patterns to build structures without the need for traditional formwork. This technique uses a cementitious



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Prefabricated structures

Prefabricated structures, also known as prefab structures, represent a modern construction approach where building components are manufactured off-site in a controlled environment and then transported to the construction site for assembly. This method offers numerous advantages, including faster construction timelines, cost efficiency, and improved quality control. Prefabrication is widely used for various types of structures, including residential buildings, commercial complexes, bridges, and industrial facilities. The key advantage of prefabricated structures lies in their efficiency. By manufacturing components such as walls, beams, and panels in factories, construction becomes less dependent on weather conditions and on-site labor availability. This not only accelerates the building process but also reduces material waste, making prefabrication an eco-friendly alternative. Additionally, the controlled factory environment ensures high precision and consistency in the production of structural components.

Prefabricated structures are also versatile and customizable, allowing architects and engineers to design modules that cater to specific project requirements. For example, prefabricated homes can be designed with energy-efficient materials and features, while industrial facilities can incorporate advanced modular systems for quick expansion or

reconfiguration. Moreover, prefabrication enhances site safety by minimizing the time and complexity of on-site construction activities. Despite these benefits, prefabricated structures face challenges such as transportation logistics and the need for skilled labor during on-site assembly. However, advancements in technology and design are addressing these hurdles, making prefabrication an increasingly popular choice in the construction industry. By combining speed, sustainability, and innovation, prefabricated structures are shaping the future of modern construction.

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