PO (PROGRAM OUTCOMES)

POs for B.E. in Civil Engineering

1. PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, and engineering & technology fundamentals, applying to the engineering specialization. To create new products and processes applying engineering knowledge.

PO 2: Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. Identifying symptoms of the problem, the overriding problem establishing the root causes and effects related to that problem, are identified and subsequently addressed in the project design. Learner must be able to identify problems, analysing them- root & cause effect, data and information gathering, generating ideas towards solution, evaluating the ideas for feasibility, understand all stakeholders and users' needs, scope of problem, solution boundary and constraints imposed to achieve solution with countermeasure plan.

PO 3: Design and development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Possess exceptional design abilities to come up with new solutions and create highly effective products. Design abilities include creating technical drawings, product plans, protocols and guidelines.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. Series of observations and informed decisions used to find and implement a solution to the problem. Beyond finding and implementing a chosen most optimal solution. Complex problem solving also involves considering future changes to circumstance, resources and capabilities that may affect the trajectory of the product or process and success of the solution, considering the impact of the solution on the surrounding environment and individuals. It includes the method of measuring solution success.

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. Also ICT tools knowledge to enable engineers to enhance their design and simulation capabilities, with more efficient and accurate planning and analysis. To facilitate platforms

for sharing and accessing project data and information, to automate leading to increased productivity, cost savings, and improved decision-making.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice. Engineers need to understand in the context of their role in society, and engineer must be understood in the context of work done within society.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. Promote saving energy, use of sustainable items among learners, making learners aware about reduce, reuse, recycle.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. To recognize ethical and professional responsibilities in engineering states & situations to make informed judgments, leading to engineering solutions in global, economic, environmental, and societal contexts.

PO 9: Individual and team work: To transform a group into an effective, cohesive and collaborative unit. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. Enable learns to understand the stages of team development- Forming stage, Storming stage, Norming stage, Performing stage, and Adjourning stage. To setteam norms set a standard for behaviour, attitude, and performance that all the learning group team members are expected to follow.

PO 10: Soft skills & Communication: Able to communicate with others. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. To communicate effectively with a range of audiences. Other soft skills that include Empathy, Adaptability, Creative thinking, Dependability, Critical Thinking, Creative thinking, Conflict resolution, Negotiation, Time management must be practised.

PO 11: Project development, management and finance: Demonstrate knowledge and understanding of the engineering development and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. To impart the

development of the product or process as well as controlling the parameters like planning, human resource, budget, scope, risk, quality and schedule or time period from managerial perspective also. Promote industry academia project development that involves collaboration between industry and academia to undertake engineering development projects that aim to address real-world challenges and create innovative solutions for the society, making learner industry and job fit.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. To incubate the culture of lifelong learning that is, self-initiated education focused on personal development. As natural learners to inculcate natural drive to explore natural curiosity, learn and grow and encourage us improve quality of life and sense of self-worth by paying attention to the contemporary ideas and goals. Encourage learners to self-learn giving rise to Renewed self-motivation, Recognition of personal interests and goals, Improvement in other personal and professional skills, Improved self-confidence, Stronger soft skills, Better cognitive health, Confidence, Networking opportunities.

PO 13: Industry and corporate skills: To align the curriculum to the job market. A graduate must be able to capable of performing as an engineer in the field of the company for which you are applying. Student must have skills that are most relevant to contemporary engineering industry domain. The student must be skilled to abridge the industry academia gap while studying. To develop proper corporate working environment in education. Curriculum must be aligned as per the industry standards, To facilitate industrial exposure to faculties. To fulfil skill gap or performance gap or employability gap.Pursue academia and Industry to form strong relationships with one another and serve the needs of society at large.

PO 14: Entrepreneurship & Startupreneurship: Practiceprocess of planning, starting and operating a business venture. Making learners to get educated from the knowledge & skills perspectives, awareness and culture for entrepreneurship. This includes - training & education, business mentoring & coaching, financing (debt or equity), networking initiatives, framework conditions and policies. Inculcate startupreneurship to create and launch innovative products or services, Building a sustainable business model for long-term success.

Program Specific Outcomes (PSOs):-

1. Graduates will be able to solve civil engineering challenges by applying their fundamental knowledge in mathematics, applied science, engineering, and management.

2. Graduates will be able to apply their knowledge of the fabrication, specification, testing, and operation of fundamental civil engineering systems to further develop their technical and professional skills.

3. Graduates will be able to develop, analyze, design, and implement advanced civil engineering systems using the ideas they have studied.

4. Possessing expertise in rapid construction and project management, the ability to oversee large infrastructure projects while leading to safe and economical project delivery.

5. The capacity to compute safe loads and stresses for designing structural members to assure serviceability and safety using building software tools.

6. Expertise to use smart transportation systems to provide inventive approaches for road safety and efficiency and to reduce the environmental impact of development by implementing green building principles.