DEPARTMENT OF CIVIL ENGINEERING

PROGRAMME: M.E. ENVIRONMENTAL ENGINEERING

VISION

- To attain global recognition as a Commendable centre for quality Engineering Education and Research

MISSION

- To equip the graduates to meet the sustainable development of Construction Industry for the betterment of the society.
- To provide quality education for the graduates to execute traditional and Ethical Civil Engineering Practices.
- To enable successful Professional Engineers to meet the Industrial challenges.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- Gain knowledge and skills in environmental engineering which will enable them to have a career and professional accomplishment in the public or private sector organizations
- Become consultants on complex real life Environmental Engineering problems related to water supply, sewerage, sewage treatment, solid waste management, air pollution control, environmental impact assessment, industrial pollution control.
- Become entrepreneurs and develop processes and technologies to meet desired environmental protection needs of society and formulate solutions that are technically sound, economically feasible, and socially acceptable.
- Perform investigation for solving environmental problems by conducting research using modern equipment and software tools.
- Function in multi-disciplinary teams and advocate policies, systems, processes and equipment for control and remediation of pollution.

PROGRAM OUTCOMES (POs)

- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

- Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- Design/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.
- 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.
- 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.
- 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.
- 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.
- Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- Communication: 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.
- Project management and finance: Demonstrate knowledge and understanding of the engineering 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.
- 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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- Use research based knowledge, methods, appropriate techniques, resources and tools to solve complex engineering issues with an understanding of the limitations.
- Ensure development of socially relevant and eco-friendly indigenous products by applying technical knowledge, ethical principles and sound engineering practices
- Recognize the need for independent, life-long learning and engage in the broadest context of technological change.

COURSE OUTCOMES (COs)

Regulation	2017
Semester	01
Course Code	MA5165
Course Name	Statistical Methods For Engineers
Course Outcome	After completing this course, students should demonstrate competency in the following topics ❖ Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem. ❖ Use statistical tests in testing hypotheses on data. ❖ Concept of linear regression, correlation, and its applications. ❖ List the guidelines for designing experiments and recognize the key historical figures in Design of Experiments. ❖ Perform exploratory analysis of multivariate data, such as multivariate normal density.

Regulation	2017
Semester	01
Course Code	EV5101

Course Name	Environmental Chemistry
Course Outcome	❖ Students will gain competency in solving environmental issues of chemicals based pollution. ❖ Ability to determine chemicals mobility in aquatic systems. ❖ Ability to identify contaminating chemicals in air and their fate. ❖ Understand the type of soil contaminants and provide remediation. ❖ Identify emerging environmental contaminants including speciation.

Regulation	2017
Semester	01
Course Code	EV4102
Course Name	Environmental Microbiology
Course Outcome	On completion of the course, the student is expected to be able to ❖ Students will gain competency in solving environmental issues of chemicals based Pollution ❖ Able to determine chemicals need calculations for treatment purpose Ability to identify contaminating chemicals.

Regulation	2017
Semester	01
Course Code	EV5103
Course Name	Design of Physico- Chemical Treatment Systems
Course Outcome	On Completion of the Course the student will be able to ❖ Able to develop conceptual schematics required for the treatment of water and wastewater and an ❖ Ability to translate pertinent forcing criteria into physical and chemical treatment system.

Regulation	2017
Semester	01
Course Code	EV5104
Course Name	Transport of Water And Wastewater
Course Outcome	❖ Be able to select various pipe materials for water supply main, distribution network and sewer. ❖ Be able to design water supply main, distribution network and sewer for various field conditions. ❖ Troubleshooting in water and sewage transmission be able to use various computer Software for the design of water and sewage network.

Regulation	2017
Semester	01
Course Code	EV5111
Course Name	Environmental Chemistry Laboratory
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Able to assess quality of environment.

Regulation	2017
Semester	01
Course Code	EV5112
Course Name	Environmental Microbiology Laboratory
Course Outcome	❖ At the end of experimental exercise, the candidate would be able to perform field oriented ❖ The candidate would be knowledgeable to perform toxicity test ❖ The candidate would be able to observe and identify the microbes in the contaminated

Regulation	2017
Semester	02
Course Code	EV5201
Course Name	Design of Biological Treatment Systems
Course Outcome	After completion of this course, the student is expected to be able to understand. ❖ Able to develop conceptual schematics required for biological treatment of wastewater ❖ Ability to translate pertinent criteria into system requirements.

Regulation	2017
Semester	02
Course Code	EV5202
Course Name	Industrial Wastewater Management
Course Outcome	On Completion of the course, the student is expected to be able to ❖ Define the Principles of pollution prevention and mechanism of oxidation processes ❖ Suggest the suitable technologies for the treatment of wastewater ❖ Discuss about the wastewater characteristics ❖ Design the treatment systems.

Regulation	2017
Semester	02
Course Code	EV5203
Course Name	Air And Noise Pollution Control Engineering
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Apply sampling techniques and Suggest suitable air pollution prevention equipments and techniques for various gaseous and particulate pollutants.

Regulation	2017	
Semester	02	Professional Elective-I

Course Code	EV5002
Course Name	Solid and Hazardous Waste Management
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Understand the characteristics of different types of solid and hazardous wastes and the factors affecting variation ❖ Define and explain important concepts in the field of solid waste management and suggest suitable technical solutions for treatment of municipal and industrial waste. ❖ Understand the role legislation and policy drivers play in stakeholders' response to the ❖ Waste and apply the basic scientific principles for solving practical waste management. ❖ Design the different elements of waste management systems.

Regulation	2017	
Semester	02	Professional Elective-II
Course Code	EV5003	
Course Name	Operation And Maintenance Of Treatment Systems	
Course Outcome	❖ The students who complete the course would have acquired the knowledge required to operate and maintain water treatment plants and wastewater treatment plants including trouble shooting Understand the current practice of waste disposal.	

Regulation	2017	
Semester	02	Professional Elective-III
Course Code	EV5006	
Course Name	Climate Change And Adaptation	
Course Outcome	After the completion of the course the students will be able ❖ The students can understand the concept of climate change and its consequences.	

	❖ The students can adopt the methodologies in finding the changes in climate.

Regulation	2017
Semester	02
Course Code	EV5211
Course Name	Environmental Processes Monitoring Laboratory
Course Outcome	On completion of the course, the student is expected to be able to ❖ After the completion of the course the students will be able to design and analyse various treatability options for water and wastewater and monitor ambient air and noise quality

Regulation	2017
Semester	02
Course Code	EV5212
Course Name	Seminar
Course Outcome	On completion of the course, the student is expected to be able to. ❖ The students will be trained to face an audience and to tackle any problem during group discussion in the Interviews

Regulation	2017
Semester	03
Course Code	EV5301
Course Name	Environmental Impact Assessment
Course Outcome	❖ After the completion of course, the student will be able to understand the necessity to studythe impacts and risks that will be caused by projects or industries and the methods to overcome these impacts. ❖ The student will also know about the legal requirements of Environmental and Risk Assessment for projects.

Regulation	2017

Semester	03	Professional Elective-IV
Course Code	EV5011	
Course Name	Environmental Risk Assessment	
Course Outcome	❖ Ability to identify fate and behaviour of toxics and persistent substances in the environment. ❖ Ability to apply the principle of risk management for solving Environmental problems.	

Regulation	2017	
Semester	03	Professional Elective-V
Course Code	EV5012	
Course Name	Remote sensing and GIS applications in environmental Management	
Course Outcome	❖ Ability to identify the environmental problems using Remote sensing. ❖ Ability to apply the principle of RS and GIS for solving Environmental problems. ❖ Ability to assess the Environmental Impacts using RS and GIS	

Regulation	2017
Semester	03
Course Code	EV5311
Course Name	Industrial Training
Course Outcome	❖ They are trained in tackling a practical field/industry orientated problem related to Environmental Engineering.

Regulation	2017
Semester	03
Course Code	EV5312
Course Name	Project Work (Phase I)
Course Outcome	❖ At the end of the course the students will have a clear idea of their area of work

	and they will be in a position to carry out the remaining phase II work in a systematic way.

Regulation	2017
Semester	04
Course Code	EV5411
Course Name	Project Work (Phase II)
Course Outcome	❖ On completion of the project work students will be in a position to take up any challenging practical problem in the field of engineering design and find better solutions to it.