

Shivaji University, Kolhapur

Department of Technology

Vision

To be a leader in engineering and technology education, a research centre of global standards to provide valuable resources for industry and society through development of competent technical human resources.

Mission

1. To develop technocrats of national & international stature committed to the task of nation building.
2. To organize teaching learning programs to facilitate the development of competent and committed professionals for practice, research and academics.
3. To undertake collaborative research projects that offer opportunities for consistent interaction with industries.

Name of Programme: M.Tech. (Environmental Science and Technology)

Program Outcomes:

1. A capability to plan, designs, and conduct experiments related to environmental systems.
2. A capability to analyze, critique, interprets and presents experimental results.
3. A capability to analyze real life environmental problems and devise an a

appropriate system for solving the problems.

4. A capability to apply environmental engineering knowledge and modern tools for design, operation and maintenance of environmental facilities required for the protection of environment.
5. A capability to formulate, solve and simulate complex real life environmental problem using the imparted knowledge of numerical methods and optimization techniques.
6. A capability to carry out the studies on environmental degradation and protection independently and in team to develop leadership skills.
7. A capability to create awareness on environmental protection through effective communication and active participation in societal activities.
8. A capability to demonstrate professional skills through participation in multidisciplinary activities.
9. A capability to demonstrate high regard for environmental ethics and ethical responsibility.
10. A capability to devise an environmental issue in to a research problem leading to development of research aptitude.
11. A capability to develop sensitivity towards safety and health in context to societal and industrial environmental hazards.
12. Captivate in self-supporting and lifelong learning in the context of rapid technological changes.

Program Specific Outcomes:

PSO1. Demonstrate the ability to undertake research projects on environmental engineering and other related issues.

PSO2. An ability to independently carry out research/investigation and develop work to solve practical problems

Course Outcomes:

Part-I Semester-I

ESTC 11	Physico-Chemical and	1. Able to know various processes used in water and wastewater treatment.
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	Biological Processes	<p>2. Able for various design criteria with design procedure for water and wastewater treatment plant.</p> <p>3. Understanding of basic principle of mass transfer.</p> <p>4. Able to learn mechanisms and modes of disinfection.</p>
ESTC 12	Remote Sensing and GIS Applications in Environmental Engineering	<p>1. Ability to know the basic remote sensing and GIS</p> <p>2. Knowledge of Application of remote sensing and GIS in various fields.</p> <p>3. Develop a critical awareness of the strengths and limitations of monitoring using Remote Sensing</p> <p>4. Wider role of Remote Sensing and GIS in environmental modeling and monitoring.</p>
ESTC 13	Solid and Hazardous Waste Management	<p>1. Ability to know the functional elements of solid waste with management.</p> <p>2. Able to know biomedical and Hazardous Wastes management.</p> <p>3. Knowledge for solving and communication skills to specific problems in order to practice the role of health and safety professionals in managing hazardous materials and wastes.</p> <p>4. Understand fundamental principles of existing and emerging technologies for the treatment of waste and recovery of value from waste.</p>

ESTE 11	Energy and Environment	<ol style="list-style-type: none"> 1. Get knowledge of energy crisis with renewable and non-renewable energy resources. 2. Get idea about various Energy Storage system with Energy recovery systems. 3. Learn various non-conventional energy sources. 4. Understanding concept biomass energy utilization.
ESTE 23	Operational Health & Safety Management	<ol style="list-style-type: none"> 1. Able to understanding of principles of safety management. 2. Able to work as safety engineer in industry 3. Interpret and apply legislative requirements for industrial standards with best practices in a variety of workplaces. 4. Be able to make aware about the hazards, causes of accidents to the site employees.
ESTS 1	Seminar-I	<ol style="list-style-type: none"> 1. Be able to understand the reading, understanding the research paper and able to develop skill to summarize it with optimum words. 2. Able to give presentation on allotted research topic. 3. Able to recognize the need for lifelong learning. 4. Understanding and given preference to new ideas, concepts, technologies in Environmental engineering.

ESTC 14	Laboratory- I Water Quality Analysis	Ability to take samples, analyze and interpret the results of water samples.
ESTC 15	Laboratory- II Remote sensing and GIS application s in Environmental Engineering	Able to know use of various equipments in Remote sensing and GIS like GPS, DGPS and learn how to practical implementation in various environmental fields.
ESTC 16	Laboratory- III Solid and Hazardous Waste Management	Be able to design and optimize techniques in treatment after study of physical and chemical analysis of Solid and Hazardous waste.
Part-I , Semester-II		
ESTC 20	Air pollution and Control	1.Able to define air pollution and its control 2. Understanding design skills and operation of control devices for gaseous and particulate pollutants. 3. Understand reduction of emissions from automobile source by different methods and Alternative fuels and their utilizations. 4.Ability to use the basic and advance air pollution knowledge in research and development
ESTC 21	Environmental Management	1. Understanding ecological aspects and Environmental management systems.

	Systems	<p>2. Able to getting knowledge Environmental Management Plan and ISO and ISO 14000 series.</p> <p>3. Develop an understanding of the differences in the structure and function of different types of ecosystems</p> <p>4. Appreciate the purpose and role of EIA in the decision –making process with technical and social/ political limitations of EIA</p>
ESTC 22	Advanced water and wastewater treatment	<p>1. Understanding gas transfer concept and membrane filtration.</p> <p>2. Get knowledge about various technologies in Advance water and waste water treatment.</p> <p>3. Understand Design of aeration and grit chamber.</p> <p>4. Knowledge of Modelling suspended and attached growth treatment processes.</p>
ESTE 31	Industrial Waste Treatment	<p>1. To know characteristics of industrial wastewater.</p> <p>2. To understand water budget of industry with wastewater generation and conventional and non-conventional techniques for treatment of industrial waste.</p> <p>3. Able to plan location of industries, industrial estates and common effluent treatment plants.</p> <p>4. Be able to carryout industrial water budgeting and performance studies for treatment plant.</p>

ESTE 32	Environmental Policies and Legislation	<ol style="list-style-type: none"> 1. Understand the relation between constitution and environmental protection. 2. Able to Know aspects towards Environmental protection. 3. Study of Environmental Legislation and policies. 4. Understand various Environmental related Case laws.
ESTE 42	Rural Water Supply and Sanitation	<ol style="list-style-type: none"> 1. Understand magnitude of problems of rural water supply and sanitation. 2. Able to identify and understand rural issues of water supply and sanitation. 3. Acquiring skills and understanding about the development of these projects with cost effective implementation and operation & maintenance. 4. Ability in effective resource planning for rural environmental projects.
ESTS 2	Seminar II	<ol style="list-style-type: none"> 1. Be able to understand the reading, understanding the research paper and able to develop skill to summarize it with optimum words. 2. Able to give presentation on allotted research topic. 3. Able to recognize the need for lifelong learning. 4. Understanding and given preference to new ideas, concepts, technologies in Environmental

		engineering
ESTC-23	Laboratory- I Air pollution and Control	Demonstration and experiments to improve knowledge of air pollution measuring devices handling on site actually.
ESTC-24	Laboratory- II Wastewater characterization	An ability to take samples, analyze and interpret the results of wastewater samples.
ESTC-25	Laboratory- III Specific Treatment Lab	Ability to take samples, analyze and interpret the results of water and wastewater samples.
Part-II, Semester-III		
T31	Industrial Training	<ol style="list-style-type: none"> 1. An ability to apply theoretical concepts to field problems. 2. An ability to compare and analyze the differences in theoretical and field practices. 3. An ability to demonstrate professional skills through participation in multidisciplinary activities. 4. An ability to analyze real life environmental problems and devise an appropriate system for solving the problems.
S 32	Dissertation Phases -I	An ability to deal with the real life projects in environmental engineering.
Part-II , Semester-IV		
D42	Dissertation Phases- II	An ability to deal with the real life projects in environmental engineering.