

Shivaji University, Kolhapur

Name of Department: Department of Environmental Science

Name of Programme: MSc. Environmental Science

Vision
Department is always concerned for the nature conservation and committed for sustainable development through environmental education.
Mission
The Department seeks to protect, conserve and vitalize the local, regional and national environmental wealth through research, awareness and action for a healthy today and better tomorrow.
Program Outcomes
<ol style="list-style-type: none">1) Acquire in–depth knowledge and integrate with existing knowledge to sensitize the people about global and local environmental issues.2) Develop an ability to identify, critically analyze, formulate and solve environmental problems using basic principles of nature conservation. Get acquainted with environmental and social impacts of any developmental activity.3) An ability to design a system and process to meet desired needs of society within realistic limitations such as health, safety, security and environmental considerations.4) An ability to design and conduct experiments, interpret data, and provide well informed conclusions.5) Communicate effectively socio-economic problems related to environment by appropriate documentations and presentations.6) Environments 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.7) Apply ethical principles and commit to professional ethics and responsibilities and follow the norms of the any surrounding practice.
Program Specific Outcomes
I: Professional skills Ability to monitor the present status of environmental parameters through monitoring for design and development of new concept or technology.
II: Industrial Skills Successfully tackle with the industrial pollution problems through appropriate technology and tools.
III: Environmental and Social values within individual Inclusion of environmental and social values within the individual’s life.
IV: Problem Solving approach: Identify, formulate, review literature and analyze complex environmental problems and suggest suitable solutions reaching substantiated conclusions using first principles of natural science.

V: Successful development of Career and Entrepreneurship

To prepare the students with broad environmental perspective and become a successful in career and entrepreneurship.

VI: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with understanding of the limitations

Course Outcomes**Part-I Semester-I**

CC-101	Introduction to Environmental Science	CO1: Get acquainted with the scope and multidisciplinary nature of environmental science. CO2: Familiarise with the global environmental issues like Global warming, Acid rain, etc. CO3: Relate the human impact on environment. CO4: Understand the basics of environmental education. CO5: Analyse the concept of environmental ethics.
CC-102	Environmental Chemistry	CO1: Understand the basic concepts in environmental chemistry. CO2: Identify the chemical nature of air pollutants. CO3: Analyse the chemistry of water and soil pollutants. CO4: Monitor the effects of organic and inorganic chemicals in environment. CO5: Study the working of different equipments used for environmental monitoring.
CC-103	Environmental Biology	CO1: Demonstrate the structure and functions of Ecosystem. CO2: Illustrate the different characteristics of population. CO3: Enlist the characteristics of community and understand its dynamics. CO4: Aware about the aquatic and terrestrial biomes with its importance. CO5: Identify the role of microbes in soil, water and air environment.
CC-104	Information Technology in Environmental Sciences	CO1: Study the different ways of spreading awareness through media CO2: Know the basics of scientific writing. CO3: Understand the concept of intellectual property rights, patents, trademarks, trade secrets, industrial designs, etc. CO4: Relate the knowledge of remote sensing in

		<p>understanding the basics of geography.</p> <p>CO5: Apply the principles of GIS in solving various environmental problems and disaster management.</p>
Part-I Semester-II		
CC-201:	Environmental Engineering	<p>CO1: Get familiar with the engineering aspects of wastewater treatment.</p> <p>CO2: Illustrate the design and functioning of Water treatment plant, Wastewater treatment plant, and Common Effluent Treatment Plant.</p> <p>CO3: Explain the working principle of air pollution controlling equipments.</p> <p>CO4: Study the control measures of noise pollution</p> <p>CO5: Describe the concept of hazardous waste and E waste</p>
CC-202	Environmental Pollution and control	<p>CO1: Explain the classification of air pollutants with its effects on biota.</p> <p>CO2: Study the sources, measurement indices and control of noise pollution.</p> <p>CO3: Analyse the water quality parameters considering the water quality standards.</p> <p>CO4: Know the waste minimisation techniques.</p> <p>CO5: Monitor and analyse the hazards of radiation pollution.</p>
CC-203	Environmental Geo-science and Climatology	<p>CO1: Discover the solar system with the additional knowledge of origin of earth.</p> <p>CO2: Know the stratification of the atmosphere.</p> <p>CO3: Define the weather parameters with its monitoring aspects.</p> <p>CO4: Understand the structure of lithosphere with rock types and soil formation.</p> <p>CO5: Aware about the functioning and importance of biogeochemical cycles</p>
CC-204	Energy studies	<p>CO1: Classify the energy resources into renewable and non-renewable resources .</p> <p>CO2: Recognise the power and applications of solar energy</p> <p>CO3: Get acquainted with the knowledge of biomass energy.</p> <p>CO4: Make aware about the energy generation from ocean, tides and hydel power plant.</p> <p>CO5: Illustrate the mechanism and types of methods for watershed management</p>

Part-II Semester-III		
CC-301:	Natural Resources and their Conservation	<p>CO1: Classify the natural resources into renewable and non-renewable resources.</p> <p>CO2: Understand the role of abiotic natural resources like minerals fossil fuels and soil.</p> <p>CO3: Introduce the concept of biodiversity with its aspects of conservation.</p> <p>CO4: Conserve the wetlands and ground water through related knowledge.</p> <p>CO5: Identify the potential of forest resources with the concept of natural resource accounting</p>
CCS-302:	Environmental Statistics and Computer Applications	<p>CO1: Understand the concept of data analysis measures of dispersion.</p> <p>CO2: Know the aspects and use of probability and distributions.</p> <p>CO3: Recognise the sampling distribution, Chi-square test for variance, t-test for population Mean and equality</p> <p>CO4: Aware about the mathematical models like exponential, logistic models for population growth.</p> <p>CO5: Get acquainted with the basic idea of hardware and software systems with Computer applications</p>
CCS-303:	Environmental Policy and Legislation	<p>CO1: Familiarise with the international treaties and agreements for environmental conservation.</p> <p>CO2: Recognise the role of national policies and CPCB, SPCB for environmental management.</p> <p>CO3: Aware about the constitutional provisions for environmental protection.</p> <p>CO4: Understand the provisions in environmental legislations for water , air and mining .</p> <p>CO5: Introduce the concept of CRZ, PIL and PLI.</p>
DSE-304:	Environmental Toxicology and Public Health	<p>CO1: Classify the sources of toxicants in the environment.</p> <p>CO2: Aware the concepts in Ecotoxicology.</p> <p>CO3: Understand the fate of toxicants and transport of toxicants in food chain..</p> <p>CO4: Know the dose response relationship of toxicants.</p> <p>CO5: Introduce the concept of occupational health hazards with their effects.</p>
Part-II semester-IV		
CC-401:	Socioeconomic aspects of Environment	<p>CO1: Sensitise students about the present growth pattern and actual developmental aspects.</p> <p>CO2: Introduce the concept of sustainable development.</p> <p>CO3: Comprehend the environmental and developmental priorities in India, past and future.</p>

		<p>CO4: Get acquainted with the aspects of people's participation and role of NGOs in environmental protection</p> <p>CO5: Calculate the cost- benefit of developmental projects.</p>
CCS-402	Environmental Hazards and Disaster Management	<p>CO1: Define the concepts of hazards and disasters.</p> <p>CO2: Introduce the various man made hazards like industrial accidents, radiation hazards, Oil spills, forest and industrial fires and control.</p> <p>CO3: Get acquainted with the natural disasters like earthquake, volcanoes, tsunami , land slides, etc.</p> <p>CO4: Aware the different Strategies for mitigation disaster management.</p> <p>CO5: Relate the technological aspects like remote sensing and GIS in disaster management</p>
CCS-403	Environmental Planning and Management	<p>CO1: Understand the objectives and principals of environmental management with its importance.</p> <p>CO2: Recognise the need for environmental planning with demographic considerations.</p> <p>CO3: Introduce the concept of Total Quality Management.</p> <p>CO4: Bring in to light the procedure of Environmental Impact Assessment for various category projects</p> <p>CO5: Aware the importance of Environmental Audit with its procedure</p>
DSE-404	Environmental Biotechnology	<p>CO1: Introduce the role of biotechnology in Environmental Science.</p> <p>CO2: Aware about the innovative practices bioleaching, bio-absorption and bioremediation.</p> <p>CO3: Get aware with use of biotechnology in agro-industry and forestry.</p> <p>CO4: Familiarise with use of biotechnology for industrial pollution control.</p> <p>CO5: Understand the applications of genetic concept in environment management</p>