

**Jiwaji University Gwalior**  
**School of Studies in Environmental Science**

The department was established during the VII-Plan in 1988 by University Grants Commission. Modern civilization endowed with the power of Science and Technology has been responsible for local, regional and global changes in the biosphere, which in its own turn has altered the quality of human life. This has also resulted into ecological problems like population explosion, migration, rehabilitation, urbanization, industrialization, flood, desertification, land degradation, pollution, loss of biodiversity etc. These all have originated as a result of inadequate and faulty planning associated with irrational use of the natural resources, more so, the non-renewable resources. In a bid to achieve excellence in agricultural and industrial fields, earlier nation five year- Plans seem to have turned their back towards possible damages to the environment, so necessary for sustainable development. There is thus a growing need for such educational programs which impart knowledge about the delicate interactions between various environmental factors to harness a sustainable symbiotic co-existence of Man with Nature. The curriculum of environmental science has, thus, been designed to incorporate and integrate the subject matters from a large number of disciplines. In its true sense the environmental science is not only multidisciplinary but has emerged out as an integrated subject. It embodies bulk of information pertaining to health education, medicine, life sciences, earth sciences, engineering, architecture, anthropology, history, culture, economics, ethics, psychology, etc.

A number of articles and research papers have been published by the teaching staff and research scholars of the Department in various national and international journals of repute and some books have been written and edited by researchers of the Department. The Department is equipped with good teaching and research facilities including library, computers, internet and networking laboratory, UV-visible spectrophotometer, high-speed and refrigerated centrifuge, BOD incubator, pH meters, conductivity meter, handy air samplers, high volume air sampler, autoclave, water/soil analysis kit, turbidity meter, laminar air flow, exhaust gas analyzer, inverted microscope etc. The department is actively working on vermin-composting and mushroom culturing. The department is inviting different experts from well reputed institutions to interact with students and researchers to create research environment in the department.

**Programme outcomes (PO)**

For the last four decades, several environmental problems—such as pollution, global warming, ozone layer depletion, acid rain, deforestation, and desertification—have remained a major focus of scientists, policy makers, and common public across the world. These problems are perceived as the major threats to the life-supporting environment of the earth, thus making our survival on the planet increasingly unsafe. In order to tackle these challenges, holistic knowledge about working of our life-supporting environment and thorough understanding of the dynamics of these problems become imperative. Since no other academic discipline covers the above two knowledge

requirements completely, environmental science evolved as an academic discipline to fill in this gap. Our life-supporting environment and various environmental problems are highly complex and require interdisciplinary efforts to understand them. Environmental science, therefore, integrates approaches of various academic disciplines to fulfill its objectives. As per some academicians, environmental science is a methodological study of the environment and includes the study of all biophysical as well as anthropogenic conditions or circumstances under which an organism lives.

Environmental science influence our life-supporting biophysical environment, including earth processes, ecological systems, biodiversity, natural resource, alternative energy systems, climate change, various types of pollutions, and so on. These entities or processes are guided by complex interaction of physical, chemical, and biological processes, as well as significant human intervention. Therefore, environmental science integrates information from a number of other disciplines and thus is multidisciplinary in nature. Environmental science has a vast scope since it covers a wide range of subject matters or issues related to our complex life-supporting system. . Three major areas of applicability of the subject are (i) management of natural resources, (ii) conservation of ecosystem and biodiversity, and (iii) prevention and control of pollution. In addition, environmental science plays a key role in solving complex environmental issues of varying scale, including climate change, ozone layer depletion, energy crisis, desertification, urbanization, population explosion, and so on.

Our distinguishing features:

1. Upto date knowledge of subject matter of environmental science.
2. Theoretical and practical knowledge of analytical and instrumental techniques.
3. Organising field visit to Industrial areas and making the student aware about the impact of industrialisation on the Environment.
4. Conducting environmental related programmes to make students aware about the consequences of polluting the environment.

### **Programmes Specific outcomes (PSOs)**

The Environmental Studies prepares students for careers as leaders in understanding and addressing complex environmental issues from a problem-oriented, interdisciplinary perspective.

**PSO1:** Understand the concepts and methods from ecological and physical sciences and their application in environmental problem solving.

**PSO2:** Understand the concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.

- PSO3:** Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
- PSO4:** Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
- PSO5:** Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
- PSO6:** Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
- PSO7:** Demonstrate proficiency in quantitative methods, qualitative analysis, critical thinking, and written and oral communication needed to conduct high-level work as interdisciplinary scholars and/or practitioners.

### **Course Outcomes(COs) For M.Sc Programmes**

- CO1:** To learn about the fundamentals of environment and climate and soil science.
- CO2:** To understand Ecology, Biodiversity, Forestry, Wildlife & their Conservation
- CO3:** To understand the supply, demand, and allocation of the Earth's natural resources. It addresses the connections and interdependence between human economies and natural ecosystems
- CO4:** To understand the generation, storage and efficient utilization of energy and natural resources and the assessment of the interaction between the environment and energy technologies in order to establish clean and renewable energy.
- CO5:** To understand the consequences of Air, Noise Pollution on environment & what steps need to be taken Control the pollution.
- CO6:** To learn about the Water, Thermal and Radioactive Pollution
- CO7:** To learn about the Hazardous waste, Solid waste and their treatment and management processes & Occupational health.
- CO8:** To understand how to perform Environmental impact assessment, Environmental management system and Environmental Auditing.
- CO9:** To understand about Earth Processes, Hazards and Risk assessment
- CO10:** To understand the harmful effect of toxicants present in the environment and how they are degraded and Environmental Management.
- CO11:** To learn of Surveying, Photo-interpretation & Remote Sensing
- CO12:** To learn about the Environmental Administration, Law & Judicial Attitude for the conservation and management of environment.
- CO13:** To understand the Global prospects towards environmental ethics & Sustainable development
- CO14:** To learn about the Statistics, Biometry and Research Methodology.