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Anekant Education Society's
Tuljaram Chaturchand College of Arts, Science and Commerce College, Baramati
(Autonomous)
Department of Environmental Science
Course Outcomes
SEMESTER SEM I and II
F.Y.B.Sc. (2019 Pattern)

SEM-I

PAPER CODE: EVS 1101
PAPER - I: FUNDAMENTALS OF ENVIRONMENTAL SCIENCE - I
Course Outcomes:

By the end of the course, students will be able to:

CO1. Students would understand the knowledge about components of environment.
CO2. Students will understand the knowledge about Environmental problems and their solutions.
CO3. Discover knowledge in ecological perspective and value of environment.
CO4. Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.
CO5. Understand the significance of various natural resources and its management.
CO6. Students develop critical-thinking skills, analyze real-world problems, and understand the power of narrative to create sustainable solutions for local and global communities.
CO7. To explore environmental issues, engage in problem solving, and take action to improve the environment.

PAPER CODE: EVS 1102
PAPER -II: FUNDAMENTALS OF ENVIRONMENTAL BIOLOGY - I
Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will acquire knowledge about bioresources.
CO2. Study of biodiversity and apply that knowledge in day to day life.
CO3. Imparts conceptual knowledge of environment, their adaptations and interrelationship.
CO4. Use interdisciplinary approaches such as ecology, economics, ethics and policy to devise solutions to environmental problems.
CO5. Be proficient in ecological field methods such as wildlife survey, biodiversity assessment, mathematical modeling and monitoring of ecological systems.
CO6. Apply the scientific method and quantitative techniques to describe, monitor and understand environmental systems.

CO7. Evaluate current environmental issues and problems including the solutions and management practices that have been used or offered to address these issues and problems.

PAPER CODE: EVS 1103
PAPER - III: PRACTICAL BASED ON EVS 1101 EVS 1102
Course Outcomes:

By the end of the course, students will be able to:

CO1. Demonstrate a compressive understanding of the world biodiversity and the importance of its conservation.
CO2. Understand the significance of various natural resources and its management.
CO3. Evaluate hazards and risks in order to carry out a risk assessment.
CO4. Students will use a verity of laboratory techniques to safely conduct chemical experiments and procedures.
CO5. To understand verity of ecosystem of their own locality.
CO6. Describe the ecological value and consumptive use of ecosystem.
CO7. Students will have opportunity to work in research lab, bio fertilizer industry and can also be bio-entrepreneurs.

SEM-II

PAPER CODE: EVS 1201
PAPER - I: FUNDAMENTALS OF ENVIRONMENTAL SCIENCE - II
Course Outcomes:

CO1. Imparts conceptual knowledge of environment, and meteorology
CO2. Students will understand the distinguishing characters and the Energy and its resources.
CO3. Student will know the concept of meteorology and apply their knowledge in day to day life.
CO4. Students will acquire the knowledge about bio resources their conservation and sustainable use of Biodiversity.
CO5. Students will understand the knowledge about Environmental problems and their solutions.
CO6. Discover knowledge in ecological perspective and value of environment.
CO7. Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.

PAPER CODE: EVS 1202

PAPER -II: FUNDAMENTALS OF ENVIRONMENTAL BIOLOGY – II

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will acquire knowledge about bioresources.

CO2. Study of biodiversity and apply that knowledge in day to day life.

CO3. Imparts conceptual knowledge of environment, their adaptations and interrelationship.

CO4. Use interdisciplinary approaches such as ecology, economics, ethics and policy to devise solutions to environmental problems.

CO5. Be proficient in ecological field methods such as wildlife survey, biodiversity assessment, mathematical modeling and monitoring of ecological systems.

CO6. Apply the scientific method and quantitative techniques to describe, monitor and understand environmental systems.

CO7. Evaluate current environmental issues and problems including the solutions and management practices that have been used or offered to address these issues and problems.

PAPER CODE: EVS 1203

PAPER - III: PRACTICAL BASED ON EVS 1201 & EVS1202

Course Outcomes:

By the end of the course, students will be able to:

CO1. Demonstrate a compressive understanding of the world biodiversity and the importance of its conservation.

CO2. Understand the significance of various natural resources and its management.

CO3. Evaluate hazards and risks in order to carry out a risk assessment.

CO4. Students will use a verity of laboratory techniques to safely conduct chemical experiments and procedures.

CO5. To understand verity of ecosystem of their own locality.

CO6. Describe the ecological value and consumptive use of ecosystem.

CO7. Students will have opportunity to work in research lab, bio fertilizer industry and can also be bio-entrepreneurs.

Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce College, Baramati

(Autonomous)

Department of Environmental Science

Course Outcomes

SEMESTER – III and IV

S.Y.B.Sc. (2019 Pattern)

SEMESTER - III

PAPER CODE: EVS 2301

PAPER - I: NATURAL RESOURCES

1. Student understands resources, vermiculture in day to day life, Sponge fishery.
2. Students will understand basics of natural resources and their significance.
3. Students will have the knowledge of forest management and related laws.
4. Students will be able to understand resource management techniques. (insitu and exsitu methods.)
5. Students will be able to understand water and water shed management and water conflicts in India and world.
6. Students will get in depth knowledge of renewable energy resources.
7. Students will have understanding of biological energy and fuels.

PAPER CODE: EVS 2302

PAPER - II: ENVIRONMENTAL POLLUTION AND CONTROL- I

1. Student understanding w.r.t. biofertilizers, biopesticides, cropping and pest management, innovative Ex-situ and In-situ methods of pollution remediation
2. Students will able to determine soil quality and effect of fertilizers and pesticides on the soil.
3. Students will learn about various important parameters for water analysis.
4. Students will learn the stepwise detailed process of water analysis.
5. Students will understand various aerobic and anaerobic water treatment techniques and various types of water treatment plants.
6. Students will know the IS standard procedures for analysis and standard pollution levels for industries.
7. Students will expertise in waste management techniques for different type of wastes and pollution.

PAPER CODE: EVS 2303 Paper -III

Practicals based on EVS - 2301 and EVS- 2302. **No. of Practicals - 13**

1. Students will be aware about local ground water resources.
2. Students will have practical knowledge of water conservation practices like rain water harvesting.
3. Students will know marketed forest resources, medicinal and economical plants their significance.
4. Students will be able to determine content of important elements like organic carbon, nitrogen in soil.
5. Students will have practical knowledge of determining important properties of soil like EC, bulk density, salinity.
6. Students will have practical knowledge of determining important properties of water like Carbonates, bicarbonates, hardness, turbidity, salinity, DO, etc.
7. Students will be able to identify rock and mineral samples with their classification.

SEMESTER - IV

PAPER CODE: EVS 2401

PAPER – I: SOLID AND HAZARDOUS WASTE MANAGEMENT

1. Student understanding w.r.t. solid waste generation issue will be enhanced.
2. Students will be doing systematic study of solid waste issue and ways to tackle the issue.
3. Students will learn important details about collection and transport of solid waste.
4. Students will be able to identify different types of solid waste and their characteristics and classify them according to their properties.
5. Students will be able to understand economic and environmental benefits of recycling and resource recovery.
6. Students will be able to understand hazardous waste classification, types and sources.
7. Students will explore various methods of hazardous waste management including treatment storage and disposal.

PAPER CODE: EVS 2402

PAPER - II: ENVIRONMENTAL POLLUTION AND CONTROL-II

1. Students will understand various forms of environmental pollution its sources and causes.
2. Students will understand long term and short term effects of pollution on human health and ecosystem.
3. Students will learn methods for monitoring and measuring pollution levels and interpret data related to pollution.
4. Students will explore strategies and technologies for controlling air pollution.
5. Students will understand the role of air quality management in urban and industrial settings.
6. Students will understand the sources and effects of noise pollution.
7. Students will explore measures and regulations for controlling and mitigating noise pollution.

PAPER CODE: EVS 2403 Paper III

Practicals based on EVS - 2401 and EVS- 2402. **No. of Practicals - 13**

1. Students will be reinforcing theoretical concepts and developing hands-on skills.
2. Students will be able to collect and analyze environmental samples to measure pollutant concentrations.
3. Students will learn to interpret monitoring results and draw conclusions about the extent of pollution.
4. Students will be able to conduct air quality measurements using air samplers and analyzers with different analyzing methods.
5. Students will learn to use sound level meters to measure noise levels in different environments.
6. Students will identify and quantify pollutants in water samples by performing water analysis tests.
7. Students will analyze effect of pollution on plants and their chlorophyll levels.

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Course Outcomes
SEMESTER V and VI
T.Y.B.Sc. (2019 Pattern)

Semester V Paper I
Paper Code : **EVS 3501**
Title of Paper: **Ecosystem Management**

Course Outcome:

1) Students understood terrestrial ecosystem and its resources.
2) Students understood aquatic ecosystem and their importance.
3) Students will demonstrate an understanding of fundamental ecological principles, such as nutrient cycling, energy flow, and biodiversity.
4) Students will develop strategies for the conservation and restoration of ecosystems, considering both natural and human-induced disturbances.
5) Students will evaluate the challenges and opportunities associated with the conservation and management of grassland and forest ecosystems.
6) Students will explore principles and practices of sustainable forest management, including timber harvesting, reforestation, and the conservation of old-growth forests.
7) Students will understand the ecological importance of wetlands, and develop strategies for the conservation and restoration of these critical habitats.

Paper II
Paper Code : **EVS 3502**
Title of Paper: **Wildlife Biology**
Course Outcome:

1) Students get information about wildlife and their various species.
2) Students understanding diversity of wildlife and their scope.
3) Students will learn to assess different types of habitats and understand the principles of habitat management to support wildlife populations.
4) Students will comprehend the principles of conservation biology, including the importance of genetic diversity, habitat preservation, and the role of protected areas.
5) Students will be familiar with wildlife policies, laws, and regulations. They will understand the principles of wildlife management, conservation planning, and the role of stakeholders.

6) Students will understand and apply ethical principles in wildlife research and management, ensuring humane treatment of animals and responsible conduct in the field.
7) Students will demonstrate a deep understanding of wildlife ecology, including population dynamics, community interactions, and ecosystem relationships.

Paper III

Paper Code : **EVS 3503**

Title of Paper: **Geosciences**

Course Outcome:

1) Students understood origin of earth and soil weathering process.
2) Students understood natural hazards and disaster.
3) Students will demonstrate a comprehensive understanding of the Earth's internal structure, including the composition and properties of the Earth's crust, mantle, and core.
4) Students will analyze and interpret the principles of plate tectonics, including the movement of Earth's lithospheric plates, volcanic activity, and seismic events.
5) Students will identify minerals and rocks, understand their formation processes, and analyze their significance in geological contexts.
6) Students will understand atmospheric processes, climate patterns, and weather systems, including factors influencing climate change.
7) Students will study the chemical composition of Earth materials, including rocks, minerals, and fluids, and their role in geological processes.

Paper IV

Paper Code : **EVS 3504**

Title of Paper: **Nature Conservation**

Course Outcome:

1) Students aware about nature conservation methods and their international efforts.
2) Students understood objectives and challenges of nature conservation.
3) Students will understand the ecological principles that govern ecosystems and develop skills in habitat management for the conservation of biodiversity.
4) Students will gain knowledge about the conservation of wildlife species, including endangered and threatened species, and understand the principles of captive breeding and reintroduction.
5) Students will understand the legal and policy frameworks related to nature conservation at local, national, and international levels.
6) Students will learn principles and practices related to the establishment, design, and management of protected areas for conservation purposes.
7) Students will explore ethical considerations in conservation decision-making, addressing issues such as the trade-off between conservation goals and human development.

Paper V

Paper Code : **EVS 3505**

Title of Paper: **Environmental Governance, Laws and Ethics** After studying this course,

1) Students understood the Acts and laws related to Environment protection.
2) Students aware about the fundamental duties and rights and also environmental ethics.
3) Students will comprehend the principles and structures of environmental governance at local, national, and international levels.
4) Students will demonstrate knowledge of key environmental laws, regulations, and policies, including their historical development and current status.
5) Students will develop research and writing skills specific to environmental law, including the ability to interpret and analyze legal documents.
6) Students will understand mechanisms for compliance monitoring and enforcement of environmental laws, exploring the role of regulatory agencies and legal instruments.
7) Students will analyze ethical considerations and dilemmas in environmental decision-making, exploring the ethical implications of various policy choices.

Paper VI

Paper Code : **EVS 3506**

Title of Paper: **Environmental Biotechnology**

Course Outcome:

1) Students understood composting, Vermicomposting and biofuel.
2) Students understanding biotechnology and it's used to control the environmental pollution.
3) Students will gain a foundational understanding of biotechnological principles and applications in the context of environmental science.
4) Students will learn and apply various bioremediation techniques to address environmental pollution, including the use of microorganisms to degrade pollutants.
5) Students will understand and apply biotechnological methods for the treatment of various types of wastes, with an emphasis on recovering valuable resources.
6) Students will learn about the microbial processes involved in biogas production, anaerobic digestion, and other bioenergy production methods using organic waste.
7) Students will understand the regulatory frameworks governing environmental biotechnology and consider ethical aspects in the application of biotechnological solutions.

Paper VII

Paper Code : **EVS 3507**

Title of Paper : **Practical based on Sem-V EVS 3501 And EVS 3502**

Course Outcome:

1) It will help to conserve the wildlife biology.
2) Students will get job in GIS mapping and remote sensing.
3) Data analyzer will be expert to conclude the significance of biological experiments.
4) Students will demonstrate the ability to identify key components of ecosystems, including flora, fauna, and abiotic factors, through field observations and assessments.
5) Students will develop and implement strategies for the identification, control, and management of invasive species within an ecosystem.
6) Students will be able to analyze different statistical models.
7) Students will develop and implement strategies for the identification, control, and management of invasive species within an ecosystem.

Paper VIII

Paper Code : **EVS 3508**

Title of Paper : **Practical based on Sem-V EVS 3503 to EVS 3504**

Course Outcome:

1) It will help to conserve the wildlife biology.
2) Students will get job in GIS mapping and remote sensing.
3) Data analyzer will be expert to conclude the significance of biological experiments.
4) Students will develop proficiency in conducting geological fieldwork, including mapping, data collection, and observation of geological features in diverse terrains.
5) Students will gain a thorough understanding of the principles of composting, including the biological processes involved in decomposition and nutrient cycling.
6) Students will be able to set up and design composting systems, considering factors such as bin selection, size, aeration, and temperature control.
7) Students will understand the role of microorganisms in the composting process and learn techniques to manage and optimize microbial activity.

Paper IX

Paper Code : **EVS 3509**

Paper : **Practical-III**

Title of Paper: **Practical based on Sem-V EVS 3505 to EVS 3506**

Course Outcome:

1) Students will be able to identify and analyze various legal instruments related to environmental governance, including international conventions, national laws, and local regulations.
2) Students will engage with stakeholders, such as local communities and industry representatives, to understand practical challenges and considerations in environmental governance.
3) Students will conduct legal research on environmental cases, analyze court decisions, and develop case studies to understand the practical implications of environmental laws.
4) Students will participate in ethical decision-making exercises, addressing dilemmas related to environmental governance and laws.
5) Students will learn and apply aseptic techniques for handling microbial cultures, ensuring contamination-free experiments.
6) Students will develop proficiency in fundamental laboratory techniques such as pipetting, dilution, solution preparation, and accurate measurement.
7) Students will analyze experimental data, interpret results, and present findings, developing skills in scientific data analysis and reporting.

Semester-VI

T.Y.B.Sc. Environmental Science

Course Outcomes

Paper I

Paper Code : EVS 3601

Title of Paper: Climate Change

Course Outcome:

1) Sensitize about Impacts of climate change and future goals and of sustainability.
2) Aware of various policies and agreements regarding these two aspects.
3) Understand Methodologies for impact assessments and current practices of the societies.
4) Help us understand why global temperatures continue to rise, how the climate affects us, and how we can tackle this challenge before things get much worse.
5) Students will be able to define climate change.
6) Students will be able to analyze the global impact of climate change.
7) Students will be able to outline the process of climate change.

Paper II

Paper Code : EVS 3602

Title of Paper: Analytical Methods

Course Outcome:

Upon successful completion, students will have the knowledge and skills to:

1. Explain the theoretical aspects of key analytical techniques and instruments used in geochemistry, including but not limited to electron microscopy, X-ray diffraction, mass spectrometry and spectroscopy (including synchrotron techniques).
2. Strategically plan analytical campaigns to apply to different types of samples and research objectives, including selection of the most appropriate technique/instrumentation for the students' research project.
3. Undertake the correct sample preparation and characterization prior to analysis by the chosen techniques or instruments.
4. Design an analytical work-flow to acquire data and achieve the research objectives of their project.
5. Process data from the chosen instruments and demonstrate understanding of the limitations and quality of the data. Justify the approach taken to data processing.
6. Write a clear and concise justification and description of the analytical techniques employed, suitable for publication in a scientific journal.
7. Students will understand the physiological functions that regulate the proper growth and development of living things.
8. Express the role of analytical chemistry in science.

Paper III

Paper Code : **EVS 3603**

Title of Paper: **Sustainable development**

Course Outcome:

1) Students will be able to define sustainability and identify major sustainability challenges.
2) Students will have an understanding of the carrying capacity of ecosystems as related to providing for human needs.
3) Students will be able to apply concepts of sustainable development to address sustainability challenges in a global context.
4) Students will identify, act on, and evaluate their professional and personal actions with the knowledge and appreciation of interconnections among economic, environmental, and social perspectives.
5) Students will have an understanding of their social responsibility as future professionals and citizens.
6) Students will be able to analyze power, structures of inequality, and social systems that govern individual and communal life.
7) Students will be able to recognize the global implications of their actions.

Paper IV

Paper Code : **EVS 3604**

Title of Paper: **Environmental Statistics**

Course Outcome:

At the end of this course students are expected to be able:

1) To find the probabilities of various events.
2) Compute various measures of central tendency, dispersion, moments, skewness and kurtosis.
3) Compute correlation coefficient, regression coefficients and to interpret the results.
4) Compute the correlation coefficient for bivariate data and interpret it.
5) To fit linear, parabolic and exponential curves to the bivariate data to investigate relation between two variables.
6) It helps to students to environmental problems in terms of mathematical modeling to understand the impact of the chosen variables under study and show the direction of change in positive or negative manner
7) Allowing researchers to gain an understanding of environmental issues through researching and developing potential solutions to the issues they study.

Paper-V

Paper Code : **EVS 3605**

Title of Paper: **Environmental Safety and Risk Management**

After studying this course, you should be able to:

1) Define risk in the most appropriate way, and appreciate the need to prioritize risks.
2) Appreciate the costs of illness associated with workplace activities.
3) Describe in outline the development of models used to explain the cause of incidents and to promote prevention.
4) recognize the multiple causes contributing to many incidents, and be able to represent them diagrammatically
5) Illustrate the components of an integrated management system.
6) Understand the general knowledge of good laboratory safety practices and the laboratory safety rules.
7) Evaluate Standard Operating Procedures (SOPs) and safety plans for handling dangerous samples, equipments and chemicals.
8) Ability to handle experimental data using statistical tools/methods.

Paper VI

Paper Code : **EVS 3606**

Title of Paper: **Environmental Economics and Audit**

Course Outcome:

1) Students understood dimensions of natural Resources.
2) Students understanding the term Environmental Audit.
3) Students will acquire knowledge about to achieve rural development through the allocation and management of resources, mediated by develops mentalist configuration and local communities.
4) Have a detailed understanding of the disciplines of environmental economics including its key principles and methods.
5) Be able to use economic techniques to analyze environmental problems and to assess environmental policies.
6) Have a detailed understanding of the discipline of environmental economics, including its key principles and methods.
7) Be able to use economic techniques to analyse environmental problems and to assess environmental policies.
8) Have developed research skills in the field of environmental economics.

Paper VII

Paper Code : **EVS 3607**

Title of Paper : **Practical based on EVS 3601 to EVS 3603**

Course Outcome:

1) Students understood handling of instruments.
2) Students understanding the basics for industrial purpose.
3) Student understanding the sustainable farming practices.
4) Students will reduce their reliance on non renewable energy, reduce chemical use and save scarce resources.
5) Students will aware to reduce pollution and waste reduction measures like reuse and recycling.
6) know the impacts that climate change is having on the natural environment;
7) understand how soil erosion may be made worse by climate change and could in turn lead to further climate change;
8) understand how climate change has the potential to exacerbate air pollution with potentially life threatening consequences;

Paper VIII

Paper Code : **EVS 3608**

Title of Paper : **Practical based on EVS 3604 to EVS 3606**

Course Outcome:

1) Students understood the term Environmental Audit.
2) Student understood proper safety practices in chemical lab.
3) Student understood environment friendly concepts.
4) Students will understand how safety system works and risk management.
5) Emerging first aid at hazard site.
6) Allowing researchers to gain an understanding of environmental issues through researching and developing potential solutions to the issues they study.
7) To find the probabilities of various events.

Paper IX

Paper Code : **EVS 3609**
Paper : **Practical-III**
Title of Paper: **Project Work**

Course Outcome:

1) Getting of awareness of innovative methodology.
2) Students will experience about innovative methodology to solve environmental problems.
3) In a specialization domain of his / her choice, student manager will be able to choose an appropriate topic for study and will be able to clearly formulate& state a research problem.
4) For a selected research topic, student manager will be able to compile the relevant literature and frame hypotheses for research as applicable.
5) For a selected research topic, student manager will be able to plan a research design including the sampling, observational, statistical and operational designs if any.
6) For a selected research topic, student manager will be able to compile relevant data, interpret & analyze it and test the hypotheses wherever applicable.
7) Based on the analysis and interpretation of the data collected, student manager will be able to arrive at logical conclusions and propose suitable recommendations on the research problem.
8) Student manager will be able to create a logically coherent project report and will be able to defend his / her work in front of a panel of examiners

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Course Outcomes
SEMESTER SEM I and II
F.Y.B.Sc. (2022 Pattern)

SEM-I

PAPER CODE: USES 111

PAPER - I: FUNDAMENTALS OF ENVIRONMENTAL SCIENCE - I

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students would understand the knowledge about components of environment.

CO2. Students will understand the knowledge about Environmental problems and their solutions.

CO3. Discover knowledge in ecological perspective and value of environment.

CO4. Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.

CO5. Understand the significance of various natural resources and its management.

CO6. Students develop critical-thinking skills, analyze real-world problems, and understand the power of narrative to create sustainable solutions for local and global communities.

CO7. To explore environmental issues, engage in problem solving, and take action to improve the environment.

PAPER CODE: USES 112

PAPER II: FUNDAMENTALS OF ENVIRONMENTAL BIOLOGY - I

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will acquire knowledge about bioresources.

CO2. Study of biodiversity and apply that knowledge in day to day life.

CO3. Imparts conceptual knowledge of environment, their adaptations and interrelationship.

CO4. Use interdisciplinary approaches such as ecology, economics, ethics and policy to devise solutions to environmental problems.

CO5. Be proficient in ecological field methods such as wildlife survey, biodiversity assessment, mathematical modeling and monitoring of ecological systems.

CO6. Apply the scientific method and quantitative techniques to describe, monitor and understand environmental systems.

CO7. Evaluate current environmental issues and problems including the solutions and management practices that have been used or offered to address these issues and problems.

PAPER CODE: USES 113

PAPER - III: PRACTICAL BASED ON USES 111 and USES 112

Course Outcomes:

By the end of the course, students will be able to:

CO1. Demonstrate a compressive understanding of the world biodiversity and the importance of its conservation.

CO2. Understand the significance of various natural resources and its management.

CO3. Evaluate hazards and risks in order to carry out a risk assessment.

CO4. Students will use a verity of laboratory techniques to safely conduct chemical experiments and procedures.

CO5. To understand verity of ecosystem of their own locality.

CO6. Describe the ecological value and consumptive use of ecosystem.

CO7. Students will have opportunity to work in research lab, bio fertilizer industry and can also be bio-entrepreneurs.

SEM-II

PAPER CODE: USES 121

PAPER - I: FUNDAMENTALS OF ENVIRONMENTAL SCIENCE - II

Course Outcomes:

CO1. Imparts conceptual knowledge of environment, and meteorology

CO2. Students will understand the distinguishing characters and the Energy and its resources.

CO3. Student will know the concept of meteorology and apply their knowledge in day to day life.

CO4. Students will acquire the knowledge about bio resources their conservation and sustainable use of Biodiversity.

CO5. Students will understand the knowledge about Environmental problems and their solutions.

CO6. Discover knowledge in ecological perspective and value of environment.

CO7. Demonstrate a comprehensive understanding of the world's biodiversity and the importance of its conservation.

PAPER CODE: USES 122

PAPER -II: FUNDAMENTALS OF ENVIRONMENTAL BIOLOGY – II

Course Outcomes:

By the end of the course, students will be able to:

CO1. Students will acquire knowledge about bioresources.

CO2. Study of biodiversity and apply that knowledge in day to day life.

CO3. Imparts conceptual knowledge of environment, their adaptations and interrelationship.

CO4. Use interdisciplinary approaches such as ecology, economics, ethics and policy to devise solutions to environmental problems.

CO5. Be proficient in ecological field methods such as wildlife survey, biodiversity assessment, mathematical modeling and monitoring of ecological systems.

CO6. Apply the scientific method and quantitative techniques to describe, monitor and understand environmental systems.

CO7. Evaluate current environmental issues and problems including the solutions and management practices that have been used or offered to address these issues and problems.

PAPER CODE: USES 123

PAPER - III: PRACTICAL BASED ON USES 121 & USES122

Course Outcomes:

By the end of the course, students will be able to:

CO1. Demonstrate a compressive understanding of the world biodiversity and the importance of its conservation.

CO2. Understand the significance of various natural resources and its management.

CO3. Evaluate hazards and risks in order to carry out a risk assessment.

CO4. Students will use a verity of laboratory techniques to safely conduct chemical experiments and procedures.

CO5. To understand verity of ecosystem of their own locality.

CO6. Describe the ecological value and consumptive use of ecosystem.

CO7. Students will have opportunity to work in research lab, bio fertilizer industry and can also be bio-entrepreneurs.

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Department of Environmental Science
Course Outcomes

SEMESTER – III and IV
S.Y.B.Sc. (2022 Pattern)

SEMESTER - III
PAPER CODE: USES 231
PAPER - I: NATURAL RESOURCES

1. Student understands resources, vermiculture in day to day life, Sponge fishery.
2. Students will understand basics of natural resources and their significance.
3. Students will have the knowledge of forest management and related laws.
4. Students will be able to understand resource management techniques. (insitu and exsitu methods.)
5. Students will be able to understand water and water shed management and water conflicts in India and world.
6. Students will get in depth knowledge of renewable energy resources.
7. Students will have understanding of biological energy and fuels.

PAPER CODE: USES 232
PAPER - II: ENVIRONMENTAL POLLUTION AND CONTROL- I

1. Student understanding w.r.t. biofertilizrs, biopesticides, cropping and pest management, innovative Ex-situ and In-situ methods of pollution remediation
2. Students will able to determine soil quality and effect of fertilizers and pesticides on the soil.
3. Students will learn about various important parameters for water analysis.
4. Students will learn the stepwise detailed process of water analysis.
5. Students will understand various aerobic and anaerobic water treatment techniques and various types of water treatment plants.
6. Students will know the IS standard procedures for analysis and standard pollution levels for industries.
7. Students will expertise in waste management techniques for different type of wastes and pollution.

PAPER CODE: USES 233 Paper III

Practicals based on USES - 231 and USES- 232. **No. of Practicals - 13**

1. Students will be aware about local ground water resources.
2. Students will have practical knowledge of water conservation practices like rain water harvesting.
3. Students will know marketed forest resources, medicinal and economical plants their significance.
4. Students will be able to determine content of important elements like organic carbon, nitrogen in soil.
5. Students will have practical knowledge of determining important properties of soil like EC, bulk density, salinity.
6. Students will have practical knowledge of determining important properties of water like Carbonates, bicarbonates, hardness, turbidity, salinity, DO, etc.
7. Students will be able to identify rock and mineral samples with their classification.

SEMESTER - IV

PAPER CODE: USES 241

PAPER – I : SOLID AND HAZARDOUS WASTE MANAGEMENT

1. Student understanding w.r.t. solid waste generation issue will be enhanced.
2. Students will be doing systematic study of solid waste issue and ways to tackle the issue.
3. Students will learn important details about collection and transport of solid waste.
4. Students will be able to identify different types of solid waste and their characteristics and classify them according to their properties.
5. Students will be able to understand economic and environmental benefits of recycling and resource recovery.
6. Students will be able to understand hazardous waste classification, types and sources.
7. Students will explore various methods of hazardous waste management including treatment storage and disposal.

PAPER CODE: USES 242

PAPER - II: ENVIRONMENTAL POLLUTION AND CONTROL-II

1. Students will understand various forms of environmental pollution its sources and causes.
2. Students will understand long term and short term effects of pollution on human health and ecosystem.
3. Students will learn methods for monitoring and measuring pollution levels and interpret data related to pollution.
4. Students will explore strategies and technologies for controlling air pollution.
5. Students will understand the role of air quality management in urban and industrial settings.
6. Students will understand the sources and effects of noise pollution.
7. Students will explore measures and regulations for controlling and mitigating noise pollution.

PAPER CODE : USES 243 Paper III

Practicals based on USES - 241 and USES- 242. **No. of Practicals - 13**

1. Students will be reinforcing theoretical concepts and developing hands-on skills.
2. Students will be able to collect and analyze environmental samples to measure pollutant concentrations.
3. Students will learn to interpret monitoring results and draw conclusions about the extent of pollution.
4. Students will be able to conduct air quality measurements using air samplers and analyzers with different analyzing methods.
5. Students will learn to use sound level meters to measure noise levels in different environments.
6. Students will identify and quantify pollutants in water samples by performing water analysis tests.
7. Students will analyze effect of pollution on plants and their chlorophyll levels.