



**UNIVERSITY COLLEGE, MAHATMA GANDHI UNIVERSITY**

**ANNEPARTHY, NALGONDA- 508254 (A.P)**

**DEPARTMENT OF CHEMISTRY, M.Sc CHEMISTRY**

**INTER DISCIPLINARY PAPER (ID)**

**SCHEME OF INSTRUCTION AND EXAMINATION (REVISED 2013) FOR THE BATCH ADMITTED IN**

**ACADEMIC YEAR 2013-2014**

**(APPROVED BY THE BOARD OF STUDIES IN CHEMISTRY 2013)**

**SEMESTER-III**

<b>Sub. code</b>	<b>Subject</b>	<b>Instruction Hrs/week</b>	<b>Max Marks Semester Exams</b>	<b>Duration of Semester Exam (Hrs)</b>
<b>THEORY</b>				
CH-305	Environmental chemistry and natural resources & biofuels	4	100	3



**M. Sc. CHEMISTRY REVISED SYLLABUS**  
**INTER DISCIPLINARY PAPER (ID)**  
**(To be implemented for the batch admitted in 2013-2014)**  
**(Approved by the Board of Studies in Chemistry)**

**SEMESTER-III**

The syllabus embedded in this paper is meant for the students who are studying post graduate other than chemistry.

**Paper V CH-305 (ENVIRONMENTAL CHEMISTRY AND NATURAL RESOURCES & BIOFUELS)**

Unit CB 01: Ecosystem and Global environmental problems

Unit CB 02: Environmental pollution and control

Unit CB 03: Natural resources

Unit CB 04: Biofuels

Teaching hours/week-4

Marks-100

**Unit CB 01: Ecosystem and Global environmental problems**

Definition, concept, scope and importance of ecosystem. Classification of ecosystem, Structure and Structural Components of an ecosystem. Functions of ecosystem. Food Chains, food webs and ecological pyramids.

Flow of energy, Biogeochemical cycles, Homeostasis/cybernetics, Food chain concentration, Biomagnification, ecosystems value, services and carrying capacity.

Green house effect, Green House Gases(GHG), Global Warming, sea level rise, Climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions/Protocols: Earth summit, Kyoto protocol and Montreal Protocol

**Unit CB 02: Environmental pollution and control**

Definition and classification of pollution and pollutants, causes, effects and control technologies.

Air Pollution: Primary and secondary pollutants, Automobile and industrial pollution, Ambient air quality standards.

Water Pollution: Point and non-point sources of pollution, Major pollutant of water and their sources. Drinking water quality standards. Waste water treatment methods: effluent treatment plants (ETP), Sewage treatment plants, common and combined effluent treatment plants (CETP).

Soil Pollution: Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil.

Marine Pollution: Misuse of international water for dumping of hazardous waste, coastal pollution to sewage and marine disposal of industrial effluents.

Noise Pollution: Sources, industrial noise-Occupational Health hazards, standards, Methods of control of Noise.

Thermal pollution: Thermal comforts, Heat Island effect, Radiation effects.

Nuclear pollution: Nuclear power plants, nuclear radiation, disasters, and impacts, genetical disorders. Solid waste: types, collection processing and disposal of industrial and municipal solid wastes composition and characteristics of e-Waste and its management.

### **Unit CB 03: Natural resources**

Importance and Classification of Resources. Living and Non-living resources, Renewable and non-renewable resources.

Water resources: use and over utilization of surface and ground water, floods droughts.

Dams: benefits and problems.

Mineral resources: use and exploitation, environmental effects of extractions and using mineral resources-case studies.

Energy resources: growing energy needs, renewable and non-renewable energy, sources use of alternate energy sources-case studies.

Role of an individual in conservation of natural resources.

### **Unit CB 04: Bio-fuels**

Introduction of bio-fuels, types of bio-fuels, availability of bio mass, composition of biomass, terrestrial biomass, aquatic biomass. Physical and chemical properties of biomass. Useful and undesirable features of bio-fuels, energy crops, modes of utilization of biomass and their environmental impacts. Biogas and its production. Bioethanol, Bio diesel, landfill gas, biohydrogen and its sources.

Bio-fuels production, use and sustainability, use and over exploitation of energy sources and associated problems. Equitable use resources for sustainable lifestyles. Use of biological techniques in controlling air pollution; Removal of chlorinated hydrocarbons from air. Overview of transportation fuels, trends and needs, changes in biofuels.

### **Reference Books**

1. Environmental Studies, Erach Bharucha.
2. Environmental Studies, Kaushik & Kaushik.
3. Environmental Science, Anji Reddy.
4. Fundamentals of Renewable Energy systems, D.Mukherjee, S.Chakrabarti, New Age International Publishers.
5. A Text Book of Biotechnology, R.C.Dubey, S.Chand & Company Ltd.
6. Non-Conventional energy sources, G.D.Rai, Khanna Publishers.
7. Bio Technology - Expanding horizons, B.D.Sing, Kalyani Publishers, Ludhiana.