

CVM University

ARIBAS

Certificate course in "Environment Management"

Detailed Syllabus

PGCCENVM01: Pollution Monitoring and Treatment Technologies

Credits: 4, 4 Hrs Per Week

UNIT I: Drinking water standards parameters

Water Characteristics, Indian standard and International standards for drinking water. Physical parameters (Color, taste-odor, Turbidity, suspended solids, Temperature. Chemical parameters (TDS Alkalinity, Hardness, salts, acids and alkalis, chlorides, fluorides, proteins, carbohydrates, organics, fats oil & grease, Hazen units, NTU, BOD, COD, DO, TDS, Trace metals, Heavy metals, tests on quality parameters Plate counts and Most probable number (MPN). Sewage and waste water treatments systems: A. Primary treatment methods B. Secondary treatment methods and C. Tertiary treatment methods.

UNIT II: Environment pollution, assessment and monitoring

Ambient Air quality standards, dispersion of air pollutants, air sampling and analysis and control of air pollution. Water quality monitoring: Wastewater characterization. Methods for Measurement of water pollution. Sources, effects, monitoring and controlling measures of soil pollution. Noise standards and limit values. Measurement and analysis of sound, effects of noise on health, measures to control noise pollution. Thermal Pollution: Definition and sources, chemical and biological effects of thermal pollution, effects on water quality. Control of thermal pollution. Sources of marine pollution and its control. Effects of pollutants on human beings, plants, and animals.

UNIT III: Wastewater treatment technologies

Aerobic Biological Treatment Processes: Suspended growth and attached growth wastewater treatments. Process fundamentals Methods of aeration, design considerations, Operational difficulties. Description, design and operation of aerobic treatment systems: Activated Sludge process- Trickling Filters, RBC. Aerated lagoons, Waste stabilization ponds. Anaerobic Biological Treatment Processes: Anaerobic digestion, Design of anaerobic digesters, Description, design and operation of attached and suspended growth processes: Anaerobic

filters-Expanded /fluidized bed reactors-Up flow anaerobic sludge blanket reactors (UASB) and septic tank.

UNIT IV: Solid waste management

Municipal Solid Waste Management: Common components in MSW, Chemical and Physical properties of MS, Key Technologies for SWM (collection, handling, transformation, landfills, incinerators, composting), Sources of biomedical wastes, Hazardous biomedical wastes. Waste segregation and labeling, Handling, Collection, Storage and transportation. Hazardous Waste management: Sources, characteristics and categories of hazardous wastes. Toxicology and Risk Assessment of Hazardous Materials. Hazardous waste collection and transportation. Hazardous waste treatment technologies.

REFERENCE BOOKS:

1. Gabriel Bitton. Wastewater Microbiology. 3rd edition, A John Wiley & Sons, INC., Publication. ISBN: 0-471-65071-4.
2. Metcalf and Eddy Inc. (1979) Waste water Engineering treatment, Disposal, Reuse. Tata McGraw Hill Publication. Co. Ltd.
3. Soli J. Arceivala. Wastewater treatment for pollution control. 2nd edition, TataMcGrawHill Publishing Company Limited. ISBN: 0-07-463002-4.
4. Environmental Pollution and Control, by Dr H.S. Bhatia – Galgotia Publication (P) Ltd.
5. Abbasi, S. A. and E. Ramasami. (1999). Biotechnological Methods of Pollution Control, University Press, Hyderabad.
6. Wadhwa Y. (2009). Air Pollution: Causes and Control. Cyber Tech Publications, ND.
7. Sharma, B. K and Kaur, H. (1994). Water Pollution. Krishna PrakashamMandir, Meerut.
8. Wanger K.D., (1998). Environmental Management. W.B. Saunders Co. Philadelphia, USA.
9. Mahajan S.P. (1998). Pollution control in process industries, Tata McGraw Hill, ND.
10. Kreith, F. (Editor in Chief), Handbook of Solid Waste Management. McGraw-Hill, Inc. (1994).
11. Freeman, H. M., Standard Handbook of Hazardous Waste Treatment and Disposal. McGraw-Hill, Inc. (1997).

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PGCCENVM02: Legislative and Regulatory Framework for Environment Protection.

Credits: 4, 4 Hrs Per Week

UNIT I: Protection of Environment under Indian Constitution

Introduction – Indirect Provisions, International Obligations, 42nd Constitution Amendment Act, 1976. Directive Principles of State Policy - Fundamental Duties. Development of Fundamental Right to Environment - Judicial Role, Expansion of Locus Standi, PIL, Constitutional Remedy for Protection of Environment, Dynamic Interpretation of Article 21, 14 & 19 of the Constitution. Right to Wholesome Environment – Right to Clean and Pollution-free Environment, Right to Sweet Water. Incorporation of International Principles under Indian Constitution – Sustainable Development - Precautionary and Polluter Pays Principles, Absolute and Strict Liability.

UNIT II: Protection of Water, Air and Environment in India

Key pieces of environmental legislation and key regulatory authorities. Role of environmental regulation agencies for protection of environment (CPCB, SPCBs and NGOs). EP Act 1986, Air (Prevention and Control of pollution) Act, Water (Prevention and Control of pollution) Act, Mines and Mineral Act, Factories Act, Pesticides Act, Indian Forest Act, Wildlife Act, Ancient Monuments and Archaeological Sites and Remains Act, Hazardous Waste Management and Handling Rules / Biomedical Rules / Solid Waste Management Rules, Environment Tribunal Act, Climate change Protocols and Conventions.

UNIT III: Environmental Impact Assessment (EIA)

Introduction, Basic elements and methods General Aspects: EIA study - Aim, Types of organizations, Contents; Prediction of changes – Air quality, Water quality, Noise, Biological, Cultural, Socio-economic Components of EIA: Screening, IEE (Initial Environmental

Examination), Scoping, Terms of Reference (TOR), EIA report; Assessment of methodologies – Mitigation measures, Review of draft, Impact monitoring and Evaluation, Overall assessment, Selection of methods, Impacts Environmental Impact Assessment (EIA): Commonly Used Methodologies: Ad-hoc method, Map overlay method, Matrices, Delphi method Less Commonly Used Methodologies: Content analysis, Survey methods, Strategic Impact and Assumption Identification (SIAM) method, Priority Trade-off Scanning (PTS) approach, Sondheim method Emergency Methodologies: Cross Impact Analysis (CIA), Impact Tree Analysis (ITA), Modelling, Computerization, Analysis framework.

UNIT IV: Environmental Auditing

Objectives, frequency and criteria; audit team, environmental appraisal, accounting and environmental audit. Importance, Concepts, Components, Assessment, Verification, Enterprising, Environmental consciousness, Regulatory, Methods, Pre-audit activities, On-site activities, Post-audit activities, Environmental audit Environmental Clearance for Industries: Environmental clearance, EIA notification, Projects for Central government, Composition of expert committees, Projects for State government, Procedure for environmental clearance, Industrial licensing, Preparation of documents, Environmental appraisal, Siting guidelines for industries, Indian policies for EIA Environmental Legislation: Indian constitution and environment; Environmental policy of India and legislative framework – Policy monitoring and control, Central Pollution Control Board (CPCB).

REFERENCE BOOKS:

1. S.C. Shastri, Environmental Law, (3rd Edn.), Eastern Book Company, Lucknow, 2008.
2. MaheshwaraSwamy, Textbook on Environmental Law, (2nd Edn.), Asia Law House, Hyderabad, 2008.
3. Shyam Divan and Armin Rosencranz, Environmental Law and Policy in India, Oxford University Press, New Delhi, 2005.
4. Amod S. Tilak, Environmental Law, (1st Edn.), Snow White Publication, Mumbai, 2009.
5. Environmental Impact Assessment by SA Abbasi and DS Arya, 2004. Discovery Publishing House, New Delhi. (ISBN 81-7141-554-7).
6. Environment Management by PS Bhushana Rao. (2007) Regal Publications. (ISBN: 8189915088).
7. P Leelakrishnan, Environmental Law in India, (2nd Edn.), Lexis Nexis, New Delhi, 2005.
8. I.A. Khan, Environmental Law, (2nd Edn.), Central Law Agency, Allahabad, 2002.
9. Environmental Impact Assessment and Management by BB Hosetti and A Kumar. 1998. Daya Publishing House, Delhi. (ISBN 81-7035-182-0).

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PGCCENVM03:Practicals Based on PGCCENVM01 & PGCCENVM02

4 Credits (6hrs/week)

1. Determination of Dissolved oxygen.
2. Determination of BOD.
3. Determination of COD.
4. Determination of MPN of coliform.
5. Routine Bacteriological analysis of water: a. Tests for coliforms: Presumptive test, Confirmatory test and Completed test.
6. EIA questionnaires for: Airport Projects, Hotels / Beach Resorts and Other Projects located in CRZ, Industrial Projects, Mining Projects, Ports and Harbour Projects, River Valley and Hydro-electric Projects, Site Assessment for River Valley and Hydro-electric Projects.
7. Preparation of EIA Draft Report.
8. Preparation of Environment audit report.
9. Visit to industry for a survey of air and water pollution control equipment.

REFERENCE BOOKS:

1. APHA (2005) Standard methods for the examination of water and waste water, 21st edn. American Public Health Association, Washington, DC.
2. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B.S.Publication, Sultan Bazar, Hyderabad.

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8 Credits

PGCCENVM04: Project / Dissertation Work Theory

- The candidate is required to show article to faculty in/before commencing his/her experimental work.
- Two typed/computerized bound copies of the dissertation shall be submitted to the University at least fifteen days before the commencement of the final examination.

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