

# **SHRI VENKATESHWARA UNIVERSITY**



**Syllabus**

**For**

**M.Tech. (Environmental Engineering)**

**(Effective from the Session: 2019-20)**

**Shri Venkateshwara University, Gajraula, Uttar Pradesh**  
**Course and Evaluation Scheme for M. Tech. Course**  
**(Environmental Engineering)**

(Effective from session 2019-2020)

**SEMESTER II**

S. No	Subject Code	Name of the Subject	Periods			Credit	Evaluation Scheme					Subject Total
			L	T	P		Theory			Practical		
							CT	TA	ESE	TA	ESE	
1	MEV-201	Waste Water Treatment	3	0	0	3	20	10	70	--	--	100
2	MEV-202	Air and Noise Pollution and Control	3	0	0	3	20	10	70	--	--	100
3	MEV-032	Environmental Impact Assessment	3	0	0	3	20	10	70	--	--	100
4	MEV-045	Solid Waste Management	3	0	0	3	20	10	70	--	--	100
5	MEV-053	Groundwater Management	3	0	0	3	20	10	70	--	--	100
6	MEV-251	Environmental System Design Lab	--	--	3	2	--	--	--	20	30	50
7	MEV-252	Seminar-I	--	--	2	1	--	--	--	50	--	50
8	AUD-102	Disaster Management	2	0	0	0	-	-	-	-	-	-
<b>TOTAL</b>						<b>18</b>						<b>600</b>

## SYLLABI OF SUBJECTS for M.Tech. II<sup>nd</sup> Semester

L	T	P
3	0	0

### MEV-201 Wastewater Treatment

Overview of Wastewater Engineering, Terminology in Wastewater Treatment, Wastewater Flow rates, Wastewater Characteristics, Water Borne Disease, Physical and Chemical Unit Operations, Biological Unit Processes including Kinetics of Biological growth, Sludge Thickening, Digestion, Disposal and Nutrient removal, Self-Purification of Streams, Advanced Treatment Processes, Wastewater Collection, Disposal and Reuse, Introduction to generation of Industrial Waste Water.

#### TEXT BOOKS:

1. Wastewater Engineering by Metchal and Eddy- Tata McGraw-Hill Education
2. Environmental Systems Engineering by L.G. Rich - Tata McGraw-Hill
3. Water and Wastewater Engineering: Water Supply and Wastewater Removal- by Fair, Geyer and Okum. - John Wiley & Sons Canada, Limited
4. Biological Process Design for Wastewater Treatment (Prentice-Hall series in environmental sciences) by Clifford W. Randall, Larry W. Benefield - Prentice Hall (1980-01)
5. Water and Waste Treatment by E.D. Schrodter - Tata McGraw-Hill Education

L	T	P
3	0	0

### MEV-202 Air and Noise Pollution and Control

Introduction, Classification, Sources, Effects, Air Quality Standards, Role of Meteorology and Natural Purification Processes, Sampling, Measurement and Analysis, Control Devices for Particulate and Gaseous Contaminants, Industrial Pollution, Vehicular Pollution, Indoor Air Pollution.

Physics of Sound, Noise - Sources and Standards, Measurement and Control of Noise Pollution.

#### TEXT BOOKS:

1. Air pollution control theory by Martin Crawford - McGraw-Hill, 1976
2. Air pollution control by A.C. Stern.
3. Air pollution control by H.C. Perkins - McGraw-Hill, 1974
4. Air pollution control by Joe O. Ledbetter- Dekker, 1972
5. Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 2nd Edition by John H.Seinfeld, Spyros N. Pandis.
6. Fundamentals of air pollution engineering. Environmental engineering by Seinfeld, John H.

## **MEV-032 Environmental Impact Assessment**

Basic concept of EIA and Methodologies: Initial environmental Examination, Elements of EIA, - factors affecting EIA Impact evaluation and analysis, preparation of Environmental Base map, Classification of environmental parameters

E I A Methodologies: Introduction, Criteria for the selection of EIA Methodology, E I A methods, Ad-hoc methods, matrix methods, Network method Environmental Media Quality Index method, overlay methods, cost/Benefit Analysis.

Impact of Developmental Activities and Land use. Introduction, Methodology for the assessment of soil and ground water, Delineation of study area, Identification of activities. Assessment of Impact of development Activities on Vegetation and wildlife, environmental Impact of Deforestation – Causes and effects of deforestation.

Prediction and Assessment of Impact: Quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measures. E I A in surface water, Air and Biological environment: Methodology for the assessment of Impacts on surface water environment, Air pollution sources, generalized approach for assessment of Air pollution Impact. Environmental Audit & Environmental legislation: objectives of Environmental Audit, Types of environmental Audit, Audit protocol, stages of Environmental Audit, on-site activities, evaluation of Audit data and preparation of Audit report. Post Audit activities: The Environmental pollution Act, The water; Act, the Air (Prevention & Control of pollution Act.), Mota Act. Wild life Act. Case studies and preparation: of Environmental Impact assessment statement for various Industries.

### **TEXT BOOKS;**

1. Environmental Impact Assessment Methodologies, by Y. Anjaneyulu, B.S. Publication, Sultan Bazar, Hyderabad.
2. Environmental Science and Engineering, by J. Glynn and Gary W. Hein Ke – Prentice Hall Publishers

### **REFERENCE BOOKS:**

1. Environmental Science and Engineering, by Suresh K. Dhaneja – S.K., Katania & Sons Publication., New Delhi
2. Environmental Pollution and Control, by Dr. H.S. Bhatia – Galgotia Publication (P) Ltd, Delhi

## **MEV-045 Solid Waste Management**

Introduction, Overview of Solid Waste Management, Types of Solid Wastes, Sources of Solid Wastes, Properties of Solid Wastes, Solid Waste Generation, On-site Handling, Storage, Collection, Transfer and Transport, Processing Techniques, Ultimate Disposal, Resource and Energy recovery Systems, Biomedical Waste Management, Introduction to Hazardous Waste and Fly Ash Management, Site selection Criteria for Landfill.

### **TEXT BOOKS:**

1. George Tchobanoglous, Hilary Theisen and Samuel A, Vigil, Integrated Solid Waste Management, McGraw-Hill, New York, 1993
2. CPHEEO, Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organization, Government of India, New Delhi, 2000

## **MEV-053 Groundwater Management**

Introduction, Occurrence of ground water, Hydrological Cycle, Ground water movement, Well Hydraulics and Water Wells, Ground Water quality, Ground Water Modeling Techniques, Surface and Subsurface Investigations of Ground water, Artificial discharge and Recharge of Ground Water, Ground Water Management Techniques.

## **PRACTICAL COURSE**

### **MEV-251 Environmental System Design Lab**

From the following design problem minimum 4 designs are required to be done for completing Laboratory work:

1. Design problem: Design of Wastewater Treatment plant
2. Design problem: Determination of Rate Constants and Ultimate BOD
3. Design problem: Kinetics of Biological Processes
4. Design problem: Kinetics of Chemical Processes
5. Design problem: Design integrated solid waste management system
6. Design problem : Analysis of Precipitation Data
7. Design problem : Analysis of Distribution Networks
8. Design problem : Design of water Treatment plant
9. Experimental Design Problems
10. Design of Noise barrier
11. Response, Assessment and Analysis (survey and questioner based modelling)
12. Design of Air Pollution Control Devices
13. Determine the efficiency of Class II sedimentation tank for a given wastewater sample.
14. To perform Class III type settling test to determine the zone settling rate of sludge.
15. Design of Health Effect Monitoring System

On the basis of expertise subject teacher can add more design problem which are relevant to Environmental Engineering Programme.

## **AUDIT 2: DISASTER MANAGEMENT AUD 102**

**Course Objectives:** -Students will be able to:

1. learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
2. critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
3. develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
4. critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

### **SYLLABUS CONTENTS**

#### **Introduction**

Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.

**Repercussions Of Disasters And Hazards:** Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem.

Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

#### **Disaster Prone Areas In India**

Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics

#### **Disaster Preparedness And Management**

Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.

#### **Risk Assessment**

Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival.

#### **Disaster Mitigation**

Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.

### **SUGGESTED READINGS:**

1. R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies "New Royal book Company.
2. Sahni, Pardeep Et. Al. (Eds.), "Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.  
Goel S. L. , Disaster Administration And Management Text And Case Studies", Deep & Deep Publication Pvt. Ltd., New Delhi.