

NAAC Criterion-I

Curricular Aspects

Key Indicator -1.1 Curriculum Design and Development

Sub-Criteria -1.1.2



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Gola ka Mandir, Gwalior - 474005, Madhya Pradesh, India

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR – 474005
(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V. Bhopal)

CIVIL ENGINEERING DEPARTMENT

SEMESTER	2017-2019 BATCH		2020-2022 BATCH		Percentage Change
	COURSE CODE	COURSE NAME	COURSE CODE	COURSE NAME	
I	530101	Environmental Chemistry & Microbiology	530111	Environmental Chemistry & Microbiology	64.7
	530102	Materials & Equipments	530112	Solid & Hazardous Waste Management	
	530103	Quantitative Methods	530113	Advanced Treatment Process - I (Waste Water Engg)	
	530104	Solid Waste Management	DE	530114 Industrial Waste Management 530115 Environmental Auditing & Waste Management System 530116 Environmental Hydraulics	
	530105	Functional Planning Building Services & Maintenance Management	OC	800110 Sustainable Waste Management System	
	530106	Computer Lab - I	530118	Environmental Engineering Lab	
	530107	Env Lab - I	530119	Self Learning / Presentation (SWAYAM/NPTEL)	
II	530201	Air Pollution & Sound Pollution	530211	Air Pollution & Noise Pollution	
	530202	Advanced Treatment Process - I (Water Supply Engg)	530212	Advanced Treatment Process - II (Water Supply Engg)	
	530203	Advanced Treatment Process - II (Sanitary Engg)	530213	Environmental Impact Assessment & Ethics	
	530204	Project Management	DE	530214 Plastic Waste Management 530215 Electronic Waste Management	
	530205	Environmental Impact Assessment & Ethics	OC	800209 Global Climatic Changes & Disaster	
	530206	Computer Lab - II	530217	Advanced Environmental Engineering Lab	
	530207	Env Lab - II	530218	Self Learning / Presentation (SWAYAM/NPTEL)	
III	530301	Principles & Design of Biological Treatment Systems	530311	Dissertation Part - I	
	530302	Urban Hydrology & Waste Management	OC	800309 Trace & Ultra Trace Analysis of Metals using Atomic Absorption Spectrometry	
	530303	Seminar			

	530304	Preliminary Dissertation		
IV	530401	Dissertation	530405	Dissertation Part II

Course Code: 530112

Course Name: Solid and Hazardous Waste Management

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To provide broad knowledge on various aspects of planning & implementation of waste management system in a smart city/town.
- 2) To understand the principles applied in waste management.
- 3) To understand various ways to collect, treat & disposal of waste.
- 4) To understand various methods of energy recovery from waste.
- 5) To understand various aspects of hazardous waste management, E-waste management, biomedical waste management etc.

Syllabus:

Unit I:

Introduction: Introduction to waste management, classification of solid waste, objective of solid waste management, Solid waste sources – Nature and characteristics (physical, chemical & biological) – Quantities and Qualities – Generation rates – Potential of disease – Nuisance and other problems.

Unit II:

Collection and Storage: Solid waste management – Functional elements of solid waste – on – site storage – Collection and separation – Containers and its location – Collection systems and its example – Vehicle routing – Route balance – Transfer station – Processing – Recovery and reuse.

Unit III:

Processing of Municipal Solid Waste: Conveying and compacting waste – Shredding – Types of shredders – Material separation – Types – Devices for material separation – Thermal processing of municipal solid waste – incineration, pyrolysis, gasification – Refuse Derived fuel – Biological process like composting, Vermicomposting and biomethanation.

Unit IV:

Disposal: Disposal methods – Sanitary land filling – Planning – Site selection – Design – Landfill Process – Monitoring Closure – Post closure monitoring – leachate management & control of gases in landfills, environmental monitoring of landfills. MSW rules, Introduction to swachh bharat mission and smart cities program - current status, challenges and future trend of waste management.

Unit V:

Hazardous Waste Management: Introduction to hazardous waste - Definition – Characterization and composition – TCLP test – Storage and transportation of hazardous waste – Labeling of hazardous waste – Physical, Chemical and Biological treatment of hazardous waste – Bioremediation of hazardous waste – Treatment of Bio medical – Nuclear waste and Radio – Active waste – Fly ash management and E-waste management.

Course Outcomes:

Upon completion of the course, the students will be able to:

CO 1: Explain the principles & concepts of waste management.

(Handwritten signatures and initials)

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V., Bhopal MP)

CO 2: Apply various techniques of handling the waste.

CO 3: Apply various techniques of energy recovery from waste.

CO 4: Plan an effective & efficient waste management system.

Text Books:

1. Text Book of Solid Wastes Management, Iqbal H. Khan and Naved Ahsan, CBS Publishers, 1st edition 2012
2. Integrated Solid Waste Management, Hilary Theisen and Samuel A, Vigil, George Tchobanoglous, McGraw Hill Yew York, 1993

Reference Books:

1. Environmental Engineering, Rowe, Peavy & Tchobanoglous, Tata McGraw Hill Publications, 2017
2. CPHEEO, Manual on Municipal Solid Waste management, Central Public Health and Environmental Engineering organization, Government of India, New Delhi, 2016
3. Solid Waste Engineering, Vesilind P.A., Worrel H. W. and Reinhard, Thomson Learning Inc, 2003
4. Charles A. Wentz, Hazardous Waste Management, McGraw Hill, New York. 1995.
5. David Rimbers, Municipal Solid Waste Management: Pollution Technologies Review, Noyes Data Corporation, London, 1990.
6. Michael D. Lagrega, Philip L. Buckingham, Jeffrey C. Evans. Hazardous Waste Management McGraw Hill, New York. 1994.

h, M. K. Verma *20/10/20* *M. K. Verma*

Course Code: 530211

Course Name: Air Pollution & Noise Pollution

L	T	P	Credit
3	0	0	3

Course Objectives:

- 1) To provide a broad knowledge on various sources & effects of air pollution.
- 2) To understand the techniques to control air pollution and apply them.
- 3) To provide knowledge on air quality standards, monitoring of air quality.
- 4) To provide a basic knowledge on sources, effects of noise pollution & also how to reduce the pollution.

Syllabus:

Unit I Introduction:

Definition of Air Pollution, Sources and classification of air pollutants – Man made – Natural sources – Type of air pollutants – Pollution due to automobiles, Units of measurements of pollutants, Air quality criteria - emission standards – National ambient air quality standards – Air pollution indices – Air quality management in India, Air pollution survey, Air pollution from major industrial operations, Air pollution in Indian cities, Major Air pollution episodes, Air Act.

Unit II Effects of Air Pollution:

Analysis of air pollutants – Chemical, Instrumental and biological methods, Air pollution and its effects on human beings, plants and animals – Economic effects of air pollution – Effect of air pollution on meteorological conditions – Changes on the Meso scale, Micro scale and Macro scale, Global Warming, Acid Rain, Ozone Layer Depletion, Indoor Air Pollution & Occupational Diseases.

Unit III Sampling, Meteorology and Air Quality Modeling:

Sampling and measurement of particulate and gaseous pollutants – Ambient air sampling – Stack sampling, Environmental factors – Meteorology – temperature lapse rate and stability – Adiabatic lapse rate – Wind Rose – Inversion – Wind velocity and turbulence – Plume behavior – Dispersion of air pollutants- Air Quality Modeling.

Unit IV Air Pollution Control Measures:

Control – Source correction methods – Control equipments – Particulate control methods – Bag house filter – Settling chamber – cyclone separators – inertial devices – Electrostatic precipitator – scrubbers – Control of gaseous emissions – Absorption – Absorption equipments – adsorption and combustion devices (Theory and working of equipments only), odour and its control, stack monitoring kit, auto exhaust analyser.

Unit V Noise Pollution & its Control

Source of noise – Units and Measurements of Noise – Noise Standards, Noise rating system, Characterization of Noise from Construction, Mining, Transportation and Industrial Activities, Airport Noise - General Control Measures – Effects of noise pollution – auditory effects, non - auditory effects, Noise Menace- Prevention and Control of Noise Pollution – Control of noise at source,

[Handwritten signatures]

MADRAN INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to R.G.P.V., Bhopal MP)

control of transmission, protection of exposed person – Control of other types of Noise Sound Absorbent, Sound level meter.

Course Outcomes:

Upon completion of the course, the students will be able to:

- CO 1: Explain the concepts of air & noise pollution.
- CO 2: Illustrate the effects of air & noise pollution on environment.
- CO 3: Apply various techniques to measure air & noise pollution.
- CO 4: Solve air and noise pollution problems by devising solutions to the identified problems
- CO 5: Apply various techniques used in reducing the environmental pollution.

Text Books:

1. Air pollution & Control, M. N. Rao & H. V. N Rao, Tata McGraw Hill Publications., 2017
2. Air Pollution and Control Technologies, Dr. Y. Anjaneyulu, Allied publishers Pvt. Ltd., 2002.

Reference Books:

1. Sewage Disposal & Air Pollution Engineering, S.K. Garg, Khanna Publishers, 31st edition, 2008
2. Environmental Pollution Control Engineering, C. S. Rao, New Age Intl Pub., 3rd edition, 2018
3. Environmental Engineering, Rowe, Peavy & Tchobanogolous, Tata McGraw Hill Publication, 2017

