

# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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

## CIVIL ENGINEERING DEPARTMENT

### Flexible Scheme: Course Outcomes (COs)

The course outcomes of the courses of **2021 admitted batch** of the postgraduate course of Civil Engineering Program (**M.Tech Environmental Engineering**) are given below:

Courses	Course Outcome's	
<b>After the completion of this course, students will be able to:</b>		
<b>530111: Environmental Chemistry &amp; Microbiology</b>	CO1	Explain the concepts of environmental chemistry & microbiology.
	CO2	Apply the concepts of environmental chemistry in environmental engineering
	CO3	Analyse water and waste water quality parameters using the concepts of environmental chemistry.
	CO4	Apply the concepts of environmental microbiology in environmental
	CO5	Explain the concepts of energy generation in cells.
<b>530112: Solid and Hazardous Waste Management</b>	CO1	Explain the principles & concepts of waste management.
	CO2	Apply various techniques of handling the waste.
	CO3	Apply various techniques of energy recovery from waste.
	CO4	Plan an effective & efficient waste management system.
<b>530113: Advanced Treatment Process – I (Waste Water Engineering)</b>	CO1	Explain the concepts of waste water engineering & treatment
	CO2	Determine the requirements of safe disposal of sewage.
	CO3	Apply various techniques for treatment of sewage.
	CO4	Apply various techniques of sludge treatment and disposal
	CO5	Design sewage system for safe disposal of sewage.
<b>530114: Industrial Waste Management</b>	CO1	Explain basic concepts of industrial waste management
	CO2	Evaluate the effects of industrial waste on streams as per the standards
	CO3	Determine the requirements for safe disposal of sewage
	CO4	Apply suitable techniques for reduction & treatment of industrial waste & sludge
	CO5	Explain waste management techniques of different industries.
	CO1	Illustrate the process of environmental auditing.

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<b>530115: Environmental Auditing &amp; Management System</b>	<b>CO2</b>	Demonstrate the environmental audit process in industry and other projects
	<b>CO3</b>	Explain the concepts of environmental management system approach through ISO guidelines
	<b>CO4</b>	Apply various environment management methodologies like LCA, social accountability.
	<b>CO5</b>	Develop EMS in organizations and improve the existing EMS system.
<b>530116: Environmental Hydraulics</b>	<b>CO1</b>	Apply fluid mechanics principles in analysis and design of pipe flow.
	<b>CO2</b>	Apply principles of hydraulics for design of sewer lines.
	<b>CO3</b>	Apply principles of surface water hydrology for design of storm water sewer.
	<b>CO4</b>	Estimate groundwater quantity and pollution load on groundwater and surface water
	<b>CO5</b>	Apply the principles of hydraulics in design of pumping stations and estimation of pollution load
<b>800110: Sustainable Waste Management System</b>	<b>CO1</b>	Illustrate the concepts of sustainability & sustainable development.
	<b>CO2</b>	Apply various methodologies of water conservation in field.
	<b>CO3</b>	Apply various natural methodologies of wastewater treatment like wetlands.
	<b>CO4</b>	Apply various low cost sanitation & other waste management techniques.
	<b>CO5</b>	Plan for sustainable and green design of buildings.
<b>530118: : Environmental Engineering Lab</b>	<b>CO1</b>	Follow sampling procedure & other guidelines for sampling & analysis of water samples.
	<b>CO2</b>	Check various water quality parameters.
	<b>CO3</b>	Improve the water quality by suggesting suitable corrective measures.
	<b>CO4</b>	Train others on various ways of improving the quality of water.
<b>530119: Self Learning / Presentation</b>	<b>CO1</b>	<b>Analyze</b> contemporary issues in civil engineering & its allied areas through literature survey
	<b>CO2</b>	<b>Distinguish</b> state of art & relevance of the topic in national & international
	<b>CO3</b>	<b>Demonstrate</b> good oral & written communication skills
	<b>CO4</b>	<b>Develop</b> poster and power point presentations for effective communication
	<b>CO5</b>	<b>Display</b> lifelong learning
<b>530211 Air Pollution &amp; Noise Pollution</b>	<b>CO1</b>	Explain the concepts of air & noise pollution.
	<b>CO2</b>	Illustrate the effects of air & noise pollution on environment.
	<b>CO3</b>	Apply various techniques to measure air & noise pollution.
	<b>CO4</b>	Solve air and noise pollution problems by devising solutions to the identified problems
	<b>CO5</b>	Apply various techniques used in reducing the environmental pollution.

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<b>530212: Advance Treatment Process – II (Water Supply Engg.)</b>	CO1	Explain the concepts of water distribution systems including its operation & maintenance
	CO2	.Design a water distribution scheme for an area / city.
	CO3	Evaluate the water quality of an area / city with the help of available standards & guidelines.
	CO4	Explain the concepts of various water treatment techniques
	CO5	Design a water treatment scheme for an area / city.
<b>530213: Environmental Impact Assessment &amp; Ethics</b>	CO1	Illustrate the concepts of EIA
	CO2	Apply various methodologies for carrying out EIA. & laws used in EIA
	CO3	Analyse impacts on various components of environment.
	CO4	Apply various laws & ethical practices in environmental management.
	CO5	Plan for mitigation of impact & accordingly monitor the mitigation measures through environmental audit.
<b>800209: Global Climatic Changes &amp; Disaster Management</b>	CO1	Explain the basic concepts of climate change, the causes of climate change and its effect on environment.
	CO2	Determine the important climate variables and the predictions of the changes in the climate system.
	CO3	Analyse policy issues and mitigation strategies in response to climate change and other disasters
	CO4	Design an emergency water supply and sewage system
<b>530217: Advanced Environmental Engineering Lab</b>	CO1	Follow sampling procedure & other guidelines for sampling & analysis of waste water, air & solid waste samples.
	CO2	Check various waste water quality parameters.
	CO3	Analyze various solid waste characteristics.
	CO4	Analyze the level of pollutants in air.
	CO5	Analyze noise levels in an area / city
<b>530218: Self Learning / Presentation</b>	CO1	<b>Analyze</b> contemporary issues in civil engineering & its allied areasthrough literature survey
	CO2	<b>Distinguish</b> state of art & relevance of the topic in national & international
	CO3	<b>Demonstrate</b> good oral & written communication skills
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