CURRICULUM & SYLLABUS

M.Tech.

in

ENVIRONMENTAL ENGINEERING

Effective from AY: 2025-26

NATIONAL INSTITUTE OF TECHNOLOGY,

MEGHALAYA

SAITSOHPEN, CHERRAPUNJI, SOHRA- 793108

Table of Contents

Department of Civil Engineering

National Institute of Technology Meghalaya

M.Tech in Environmental Engineering

Effective from AY 2025-26

Course Type with Abbreviation	
DSC	Professional Course
DSE	Professional Elective
L	Laboratory Course
AECC	Ability Enhancement Compulsory Course
VAC	Value Added Course

Vision and Mission of the National Institute of Technology Meghalaya

VISION

Towards a Global Knowledge Hub, striving continuously in pursuit of excellence in Education, Research, Entrepreneurship, and Technological services to society

MISSION

- Imparting total quality education to develop innovative, entrepreneurial, and ethical future professionals fit for a globally competitive environment.
- Allowing stakeholders to share our reservoir of experience in education and knowledge for mutual enrichment in the field of technical education.
- Fostering product-oriented research for establishing a self-sustaining and wealth-creating center to serve the societal needs.

Vision and Mission of the National Institute of Technology Meghalaya

VISION

To be a knowledge nerve center in civil engineering education, research, entrepreneurship and industry outreach services for creating sustainable infrastructure and enhancing quality of life.

MISSION

- Generate a specialized cadre of civil engineers by imparting quality education and training
- Attain international standards in teaching, research, and consultancy with global linkages

Department of Civil Engineering

Program: M.Tech. Environmental Engineering

Program Educational Objectives

PEO-1	Apply basic principles of the environment and their significance in the socio-economic development
PEO-2	Identify, formulate and design engineered solutions to environmental problems related to air, water and land.
PEO-3	Apply best management practices for sustainable development.
PEO-4	Communicate and manage interdisciplinary teams in solving complex environmental engineering problems.
PEO-5	Demonstrate leadership qualities and exhibit professional ethics.

Program Articulation Matrix

PEO Mission Statements	PEO-1	PEO-2	PEO-3	PEO-4	PEO-5
Generate a specialized cadre of civil engineers by imparting quality education and training	3	3	3	2	2
Attain international standards in teaching, research and consultancy with global linkages	2	3	2	3	3

1 - Slightly; 2 - Moderately; 3 - Substantially

Department of Civil Engineering

Program: M.Tech. Environmental Engineering

Program Outcomes

PO-1	**Advanced Environmental Knowledge** *Develop an in-depth understanding of environmental science and engineering principles to address complex and emerging issues in water, air, soil, and waste management.*
PO-2	**Problem Solving & Innovation** *Formulate, analyze, and solve real-world environmental challenges using advanced analytical, computational, and experimental techniques while incorporating innovative and sustainable solutions.*
PO-3	**Design & System Development** *Design and implement efficient treatment systems and environmental protection strategies that meet national and international standards, considering public health, socio-economic, and ecological aspects.*
PO-4	**Environmental Data Analysis & Prediction** *Analyze and predict environmental parameters and variables using formulated methodologies, scientific tools, and advanced modeling techniques.*
PO-5	**Sustainable and Ethical Solution Design** *Design technically feasible solutions to environmental problems that are legally compliant, ethically sound, socially responsible, and economically viable.*
PO-6	**Strategy Development for Environmental Mitigation** *Develop integrated strategies for mitigating environmental issues at local, regional, and global scales, aligned with sustainable development goals and policy frameworks.*

Department of Civil Engineering

Curriculum
M.Tech. Environmental Engineering

SEMESTER – 1							
Course Code	**Course Title**	Course Type	**Contact Hours**			**Credit**	**Prerequisites**
			L	T	P	C	
Professional Core Courses 1,2, 3							
CE 531	Physico-Chemical Processes and Design	DSC	3	0	0	3	None
CE 533	Water Supply and Sanitation Engineering	DSC	3	0	0	3	None
CE 591	Statistical Modelling and Simulation	DSC	3	0	0	3	None
Professional Elective 1 & 2							
CE 535	Urban Environmental Management	DSE	3	0	0	3	None
CE 537	Sustainable Energy Generation and Its Use	DSE	3	0	0	3	None
CE 539	Disaster Risk Management and Emergency Response	DSE	3	0	0	3	None
CE 541	Food Safety and Hygiene Management	DSE	3	0	0	3	None
CE 543	Soil and groundwater remediation	DSE	3	0	0	3	None
CE 545	Environmental Chemistry & Biotechnology	DSE	3	0	0	3	None
CE 547	Public Health Engineering	DSE	3	0	0	3	None

CE 549	Environmental Policy and Legislation	DSE	3	0	0	3	None
CE 571	Clean Environmental Technology	DSE	3	0	0	3	None
CE 573	Indian Knowledge System	DSE	3	0	0	3	None
Lab Courses - 1, 2, 3							
CE 575	Water & Wastewater Quality Analysis Lab	L	0	0	2	1	None
CE 577	Soil and Environmental Chemistry Lab	L	0	0	2	1	None
CE 579	Simulation & Modeling Lab I	L	0	0	2	1	None
Minor project							
CE 581	Technical Report Writing	AECC	0	0	2	1	None
Total Contact Hours – Component-wise			**15**	**0**	**8**		
Total Contact Hours			**23**			**19**	---

SEMESTER – 2							
Course Code	**Course Title**	**Course Type**	**Contact Hours**			**Credit**	**Pre- requisites**
			L	**T**	**P**	**C**	
Professional Core Courses - 4, 5							
CE 532	Air & Noise Pollution Management: Effects and Control	DSC	3	0	0	3	None
CE 534	Advanced Waste Management System	DSC	3	0	0	3	None
Professional Elective – 3,4							
CE 536	Air Quality Monitoring and Control Technologies	DSE	3	0	0	3	None
CE 538	Industrial Wastewater Pollution Control	DSE	3	0	0	3	None
CE 540	Environmental Catalysis	DSE	3	0	0	3	None
CE 542	GIS & Remote Sensing	DSE	3	0	0	3	None
CE 544	Advances in Sustainable Engineering	DSE	3	0	0	3	None
CE 546	Environmental Impact & Risk Assessment	DSE	3	0	0	3	None
CE 548	Environmental Quality Modeling	DSE	3	0	0	3	None

CE 582	Geo-Environmental Engineering	DSE	3	0	0	3	None
Lab Courses - 4, 5, 6							
CE 584	Air Pollution Monitoring Lab	L	0	0	2	1	None
CE 586	Remote Sensing & GIS Lab	L	0	0	2	1	None
CE 588	Simulation & Modelling Lab-II	L	0	0	2	1	None
Minor project							
CE 590	Case Study Analysis	VAC	0	0	2	1	None
Project							
CE 592	Project Review/Minor Project II	VAC	0	0	4	2	None
Total Contact Hours – Component wise			12	0	12		
Total Contact Hours			**24**			**18**	**---**

SEMESTER – 3					
Course		**Course**	**Contact Hours**	**Credit**	**Pre- requisites**

Code	Course Title	Type	L	T	P	C	
CE 611	Industry-oriented training/Internship/Project	VAC	0	0	4	2	None
CE 613	Project-I	VAC	0	0	22	11	None
Total Contact Hours – Component wise			0	0	26		
Total Contact Hours			**26**			**13**	---

SEMESTER – 4

Course Code	Course Title	Course Type	Contact Hours			Credit	Pre- requisites
			L	T	P	C	
CE 612	Project-II	VAC	0	0	28	14	None
Total Contact Hours – Component wise			0	0	28		
Total Contact Hours			**28**			**14**	---

Components Credit Summary - MTech Curriculum						
Course Type with Abbreviation		**I**	**II**	**III**	**IV**	**Total**
DSC	Dept. Specific Core	9	6	-	-	**15**

DSE	Dept. Specific Elective	6	6	-	-	**12**
L	Laboratory Course	3	3	-	-	**6**
AECC	Ability Enhancement Compulsory Course	1	-	-	-	**1**
VAC	Value Added Course	-	3	13	14	**30**
	CRDITS (per Sem.)	*19*	*18*	*13*	*14*	
Total Credits						**64**