Format K1

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP)

Academic Year: **2025-26 (Even)**

Institute Code and Name: 0078- K. K. Wagh Polytechnic, Nashik **Semester**: Fourth
Programme and Code: Chemical Engineering (CH) **Course Index:** 401
Course and Code: Environmental Education and Sustainability (EES) 314301
Name of Faculty: Mrs. A. B. Shaikh **CLASS: SYCH**

INDUSTRY EXPECTED OUTCOME

Resolve the relevant environmental issue through sustainable solutions.

COURSE LEVEL LEARNING OUTCOMES (COS)

- **CO401.1** - Identify the relevant Environmental issues in specified locality.
- **CO401.2** - Provide the green solution to the relevant environmental problems.
- **CO401.3** - Conduct SWOT analysis of biodiversity hotspot
- **CO401.4** - Apply the relevant measures to mitigate the environmental pollution.
- **CO401.5** - Implement the environmental policies under the relevant legal framework

TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										
				Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		Total Marks
											FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
				CL	TL	LL					Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
314301	Environmental Education and Sustainability	EES	VEC	3	-	-	1	4	2	1.5	30	70*#	100	40	-	-	-	-	25	10	125

Total IKS Hrs for Sem.: 1 Hrs

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @$ Internal Online Examination

THEORY LEARNING OUTCOME (TLO)

TLO No.	Title of TLO
TLO 1.1	Explain the need of studying environment and its components.
TLO 1.2	Investigate the impact of population growth and industrialization on the relevant environmental issues and suggest remedial solutions
TLO 1.3	Explain the Concept of 5 R w.r.t. the given situation
TLO 1.4	Elaborate the relevance of Sustainable Development Goals in managing the climate change
TLO 1.5	Explain the concept of zero carbon-footprint with carbon credit
TLO 2.1	Justify the importance of natural resources in sustainable development
TLO 2.2	Explain the need of optimum use of natural resources to maintain the sustainability

TLO 2.3	Differentiate between renewable and non-renewable sources of energy
TLO 2.4	Suggest the relevant type of energy source as a green solution to environmental issues
TLO 3.1	Explain the characteristics and functions of ecosystem
TLO 3.2	Relate the importance of biodiversity and its loss in the environmental sustainability
TLO 3.3	Describe biodiversity assessment initiatives in India
TLO 3.4	Conduct the SWOT analysis of the biodiversity hot spot in India
TLO 3.5	Explain the need of conservation of biodiversity in the given situation
TLO 4.1	Classify the pollution based on the given criteria
TLO 4.2	Justify the need of preserving soil as a resource along with the preservation techniques
TLO 4.3	Maintain the quality of water in the given location using relevant preventive measures
TLO 4.4	State the significance of controlling the air pollution to maintain its ambient quality norms
TLO 4.5	Compare the noise level from different zones of city with justification
TLO 4.6	Describe the roles and responsibilities of central and state pollution control board
TLO 5.1	Explain Constitutional provisions related to environmental protection
TLO 5.2	Explain importance of public participation (PPP) in enacting the relevant laws
TLO 5.3	Use the relevant green technologies to provide sustainable solutions of an environmental problem
TLO 5.4	Explain the role of information technology in environment protection

SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	**Programme Outcomes (POs)**							**Programme Specific Outcomes (PSOs)**		
	PO-1 Basic and Discipline Specific Knowledge	**PO-2 Problem Analysis**	**PO-3 Design/ Development of Solutions**	**PO-4 Engineering Tools**	**PO-5 Engineering Practices for Society, Sustainability and Environment**	**PO-6 Project Management**	**PO-7 Life Long Learning**	**PSO-1**	**PSO-2**	**PSO-3**
CO1	--	1	-	-	3	2	3			
CO2	--	2	2	-	3	2	3			
CO3	--	--	-	-	3	1	2			
CO4	1	--	-	-	3	2	2			
CO5	1	--	2	-	3	2	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*PSOs are to be formulated at institute level

Maharashtra State Board of Technical Education K-1

Teaching Plan (TP)

Academic Year: 2025-26
Program: Chemical Engineering
Course: Environmental Education and Sustainability (EES)
Name of faculty: Mrs. A. B. Shaikh

Institute Code: 0078
Course Code: 314301
Semester: FOURTH (CH-4K)

Chap No. (Alloted Hrs.)	CO Mention only Number	TLO Mention only Number	Unit Name and Learning Content Title/ Details	No. of Lecture	Plan (From-To)	Actual Execution (From-To)	Teaching method/ Media	Remark
Unit - I Environment and climate change								
1 (08)	**CO-1**	**TLO 1.1**	1.1 Environment and its components, Types of Environments, Need of environmental studies	01	19/12/2025		Blackboard, Books, media, PPT	
		TLO 1.2	1.2 Environmental Issues- Climate change, Global warming, Acid rain, Ozone layer depletion, nuclear accidents. Effect of population growth and industrialization	01	19/12/2025			
		TLO 1.3	1.3 Concept of 5R, Individuals' participation in i) 5R policy, ii) segregation of waste, and iii) creating manure from domestic waste **MKCL Quiz-1**	02	20/12/2025 To 26/12/2025			
		TLO 1.4	1.4 Impact of Climate change, Factors contributing to climate change, Concept of Sustainable development, Sustainable development Goals (SDGs), Action Plan on Climate Change in Indian perspectives	02	26/12/2025 To 27/12/2025			
		TLO 1.5	1.5 Zero Carbon footprint for sustainable development, (IKS-Enviornment conservation in vedic and pre-vedic India) **MKCL Quiz-2, Practice Test-1**	02	02/01/2026 To 02/01/2026			

Chap No. (Alloted Hrs.)	CO Mention only Number	TLO Mention only Number	Unit Name and Learning Content Title/ Details	No. of Lecture	Plan (From-To)	Actual Execution (From-To)	Teaching method/ Media	Remark
Unit - II Sustainability and Renewable Resources								
2(10)	**CO-2**	**TLO 2.1**	2.1 Natural Resources: Types, importance, Causes and effects of depletion. (Forest Resources, Water Resources, Energy Resources, Land resources, Mineral resources), (IKSConcepts of Panchmahabhuta)	2	03/01/2026 To 09/01/2026		Blackboard, Books, media, PPT	
		TLO 2.2	2.2 Impact of overexploitation of natural resources on the environment, optimum use of natural resources **MKCL Quiz-3**	3	09/01/2026 To 16/01/2026			
		TLO 2.3	2.3 Energy forms (Renewable and nonrenewable) such as Thermal energy, nuclear energy, Solar energy, Wind energy, Geothermal energy, Biomass energy, Hydropower energy, biofuel	3	16/01/2026 To 23/01/2026			
		TLO 2.4	2.4 Green Solutions in the form of New Energy Sources such as Hydrogen energy, Ocean energy & Tidal energy **MKCL Quiz-4, Practice Test-2**	2	23/01/2026 To 24/01/2026			
Unit - III Ecosystem and Biodiversity								
3(08)	**CO-3**	**TLO 3.1**	3.1 Ecosystem - Definition, Aspects of ecosystem, Division of ecosystem, General characteristics of ecosystem, Functions of ecosystem.	2	30/01/2026 to 30/01/2026		Blackboard, Books, media, PPT	
		TLO 3.2	3.2 Biodiversity - Definitions, Levels, Value, and loss of biodiversity.	1	31/0/2026			
		TLO 3.3	3.3 ecosystem 3.3 Biodiversity Assessment Initiatives in India. **MKCL Quiz-5**	1	06/02/2026			
		TLO 3.4	3.4 SWOT analysis of biodiversity hot spot in India	2	06/02/2026 To 07/02/2026			

Chap No. (Alloted Hrs.)	CO Mention only Number	TLO Mention only Number	Unit Name and Learning Content Title/ Details	No. of Lecture	Plan (From-To)	Actual Execution (From-To)	Teaching method/ Media	Remark
		TLO 3.5	3.5Conservations of biodiversity - objects, and laws for conservation of biodiversity. **MKCL Quiz-6, Practice Test-3**	2	13/02/2026 To 13/02/2026			
Unit - IV Environmental Pollution								
4(12)	**CO-4**	**TLO 4.1**	4.1 Definition of pollution, types- Natural & Artificial (Man- made)	2	14/02/2026 To 20/02/2026		Blackboard, Books, media, PPT	
		TLO 4.2	4.2 Soil / Land Pollution – Need of preservation of soil resource, Causes and effects on environment and lives, preventive measures, Soil conservation	2	20/02/2026 to 21/02/2026			
		TLO 4.3	4.3 Water Pollution - sources of water pollution, effects on environment and lives, preventive measures, BIS water quality standards for domestic potable water, water conservation **MKCL Quiz-7**	2	27/02/2026 to 27/02/2026			
		TLO 4.4	4.4 Air pollution - Causes, effects, prevention, CPCB norms of ambient air quality in residential area	2	28/02/2026 To 06/03/2026			
		TLO 4.5	4.5 Noise pollution - Sources, effects, prevention, noise levels at various zones of the city	2	06/03/2026 To 07/03/2026			
		TLO 4.6	4.6 Pollution Control Boards at Central and State Government level: Norms, Roles and Responsibilities **MKCL Quiz-8, Practice Test-4**	2	13/03/2026 To 13/03/2026			
Unit - V Enviornmental legislation and sustainable practices								
5(07)	**CO-5**	**TLO5.1**	5.1 Article (48-A) and (51-A (g)) of Indian Constitution regarding environment, Environmental protection and	2	14/03/2026 To		Blackboard, Books,	

Chap No. (Alloted Hrs.)	CO Mention only Number	TLO Mention only Number	Unit Name and Learning Content Title/ Details	No. of Lecture	Plan (From-To)	Actual Execution (From-To)	Teaching method/ Media	Remark
			prevention acts		20/03/2026		media, PPT	
		TLO 5.2	5.2 Public awareness about environment. Need of public awareness and individuals' participation. Role of NGOs **MKCL Quiz-9**	2	20/03/2026 To 21/03/2026			
		TLO 5.3	5.3 Green technologies like solar desalination, green architecture, vertical farming and hydroponics, electric vehicles, plant-based packaging	2	27/03/2026 To 27/03/2026			
		TLO 5.4	5.4 Role of information technology in environment protection and human health **MKCL Quiz-10, Practice Test-5**	1	28/03/2026			
			Beyond Syllabus Topic	1	03/04/2026			

ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning)

- Two-unit tests (MCQs) of 30 marks will be conducted and average of two-unit tests considered. Formative assessment of self learning of 25 marks should be assessed based on self learning activity such as UNICEF Certification(s)/Microproject/assignment/activities. (60 % weightage to process and 40 % to product)

B. Summative Assessment (Assessment of Learning)

- Online MCQ type Exam

SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No.	Author	Title of Book	Publication
1	Y. K. Singh	Environmental Science	New Age International Publishers, 2006, ISBN: 81- 224-2330-2
2	Erach Bharucha	Environmental Studies	University Grants Commission, New Delhi
3	Rajagopalan R.	Environmental Studies: From Crisis to Cure.	Oxford University Press, USA, ISBN: 9780199459759, 0199459754
4	Shashi Chawla	A text book of Environmental Science	Tata Mc Graw-Hill New Delhi
5	Arvind Kumar	A Text Book of Enviornmental science	APH Publishing New Delhi (ISBN 978-8176485906)

LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	https://sdgs.un.org/goals	United Nation's website mentioning Sustainability goals
2	http://www.greenbeltmovement.org/news-and-events/blog	Green Belt Movement Blogs on various climatic changes and other issues
3	http://www.greenbeltmovement.org/what-we-do/tree-planting- fo r-watersheds	Green Belt Movement's work on tree plantation, soil conservation and watershed management techniques
4	https://www.youtube.com/@ierekcompany/videos	International Experts For Research Enrichment and Knowledge Exchange – IEREK's platform to exchange the knowledge in fields such as architecture, urban planning, sustainability
5	www.mahayouthnet.in	UNICEF Intiative for youth leadership for climate action
6	https://eepmoefcc.nic.in/index 1.aspx? lsid=297&lev=2&lid=1180 &langid=1	GOI Website for public awareness on enviornmetal issues
7	https://egyankosh.ac.in/handle/123456789/61136	IGNOU's Intiative for online study material on Enviornmental studies

Sr. No	Link / Portal	Description
8	https://egyankosh.ac.in/handle/123456789/50898	IGNOU's Intiative for online study material on sustainability
9	https://sustainabledevelopment.un.org/content/documents/1180 3Official-List-of-Proposed-SDG-Indicators.pdf	Final list of proposed Sustainable Development Goal indicators
10	https://sustainabledevelopment.un.org/memberstates/india	India's Strategies to progress across the SDGs.
11	https://www.un.org/en/development/desa/financial-crisis/sust ainable-development.html	Challenges to Sustainable Development
12	https://nptel.ac.in/courses/109105190	NPTEL course on sustainable development
13	https://onlinecourses.swayam2.ac.in/cec19_bt03/preview	Swayam Course on Enviornmetal studies (Natural Resources, Biodiversity and other topics)
14	https://onlinecourses.nptel.ac.in/noc23_hs155/preview	NPTEL course on enviornmental studies which encomopasses SDGs, Pollution, Cliamate issues, Energy, Policies and legal framework
15	https://www.cbd.int/development/meetings/egmbped/SWOT - analys is-en.pdf	SWOT analysis of Biodiversity
16	https://www.sanskrit.nic.in/SVimarsha/V2/c17.pdf	Central sanskrkit university publication on Vedic and pre vedic enviornmetal conservation

Note : Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

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