Format K1

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP) Academic Year: **2026-27 (ODD)**

Institute Code and Name: 0078- K. K. Wagh Polytechnic, Nashik **Semester**: Third
Programme and Code: Chemical Engineering (CH) **Course Index:** 302
Course and Code: Chemical Process Technology(CPT) 313337
Name of Faculty: Mrs. A. B. Shaikh **CLASS: SYCH**

INDUSTRY EXPECTED OUTCOME

The course should be taught and implemented with the aim to develop required skills in students so that they are able to acquire following industry outcome:
Chemical engineering student will be able to select appropriate chemical manufacturing process for the given application.

COURSE LEVEL LEARNING OUTCOMES (COS)

- CO302.1 - Identify manufacturing process for acid and alkali from given raw material.
- CO302.2 - Select fertilizer manufacturing process for given application.
- CO302.3 - Identify manufacturing process for oil and soap from given raw material.
- CO302.4 - Select manufacturing process of polymer from given monomer.
- CO302.5 - Identify various alcohol and phenol manufacturing methods for given application.

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	
313338	CHEMICAL PROCESS TECHNOLOGY	CPT	DSC	3	-	4	1	8	4	03	30	70	100	40	25	10	25#	10	25	10	175

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	Select raw materials for the manufacturing process.
TLO 1.2	Optimize reaction parameters.
TLO 1.3	Draw process flow diagram for manufacturing process.
TLO 1.4	Explain process flow diagram for manufacturing process.
TLO 1.5	Explain properties and applications of acids and alkalis

TLO 2.1	Identify different types of fertilizers.
TLO 2.2	Draw process flow diagram for manufacturing process.
TLO 2.3	Select the appropriate type of fertilizer for given application.
TLO 2.4	Explain applications of fertilizer.
TLO 2.5	Differentiate between chemical fertilizer and bio fertilizer.
TLO 3.1	Analyse quality of oil as per given parameters.
TLO 3.2	Apply solvent extraction process for improving oil recovery.
TLO 3.3	Explain manufacturing of soap.
TLO 3.4	Classify soap on the basis of total fatty matter.
TLO 4.1	Explain mechanism of polymerization
TLO 4.2	Select raw materials for the manufacturing process.
TLO 4.3	Draw process flow diagram for manufacturing process.
TLO 4.4	Explain process flow diagram for manufacturing process.
TLO 4.5	Optimize reaction parameters for identified process.
TLO 5.1	Select raw materials for the manufacturing process.
TLO 5.2	Draw Process flow diagrams for the manufacturing process.
TLO 5.3	Explain Process flow diagrams for the manufacturing process.
TLO 5.4	Optimize reaction parameters for identified process.
TLO 5.5	Explain properties and applications of alcohol and phenol.

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	3	1	1	1	1	1	2	2	2	--
CO2	3	-	1	-	2	1	2	1	2	--
CO3	3	1	1	2	2	1	2	2	2	--
CO4	3	-	1	-	1	1	2	2	2	--
CO5	3	1	1	1	1	1	2	2	2	--

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: 2024-25 **Institute Code:** 0078
Program: Chemical Engineering **Course Code:** 313338
Course: Chemical Process Technology **Semester:** Third (CH-2K)
Name of faculty: Mrs. A. B. Shaikh

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 Manufacturing of Acid and Alkali								
1 (08)	**CO-1**	**TLO 1.1**	1.1 Raw materials, chemical reaction, process description with flow diagram for manufacturing of hydrochloric acid.	1	02/07/2026		Blackboard, Books, media, PPT	
		TLO 1.2	1.2 Raw materials, chemical reaction, process description with flow diagram for manufacturing of sulphuric acid. Comparison between vanadium pentaoxide and platinum catalyst. **MKCL Quiz 1**	2	04/07/2026 to 07/07/2026			
		TLO 1.3	1.3Raw materials, chemical reaction, process description with flow diagram for manufacturing of sodium hydroxide.	2	07/07/2026 to 09/07/2026			
		TLO 1.4	1.4Raw materials, chemical reaction, process description with flow diagram for manufacturing of sodium carbonate by Solvay's process.	2	11/07/2026 to 14/07/2026			
		TLO 1.5	1.5Properties and uses of hydrochloric acid, sulphuric acid, sodium hydroxide and sodium carbonate.	1	14/07/2026			
			Practice test 1 and MKCL Quiz 2	1	16/07/2026			**1 extra**
Unit - II Manufacturing of Fertilizer								

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
2(10)	CO-2	**TLO 2.1**	2.1 Classification of fertilizers (Straight, Complex and mixed).	1	18/07/2026		Blackboard, Books, media, PPT	
		TLO 2.2	2.2 Raw materials, chemical reaction, process description with flow diagram for manufacturing of urea. **MKCL Quiz 3**	2	21/07/2026 To 21/07/2026			
		TLO 2.3	2.3 Raw materials, chemical reaction, process description with flow diagram for manufacturing of single super phosphate and triple super phosphate.	2	23/07/2026 to 25/07/2026			
		TLO 2.4	2.4Raw materials, chemical reaction, process description with flow diagram for manufacturing of Di- ammonium phosphate. **MKCL Quiz 4**	2	28/07/2026 to 28/07/2026			
		TLO 2.5	2.5Mixed fertilizer :Importance of mixed fertilizers. Bio fertilizer : Need and importance of bio fertilizers.	2	30/07/2026 to 01/08/2026			
			Practice test 2	1	04/08/2026			
Unit - III Manufacturing of Oil and Soap								
3(08)	CO-3	**TLO 3.1**	3.1 Process description with flow diagram of oil extraction from oil seed.	2	04/08/2026 to 06/08/2026		Blackboard, Books, media, PPT	
		TLO 3.2	3.2 Hydrogenation process of oil. **MKCL Quiz 5**	2	08/08/2026 to 11/08/2026			
		TLO 3.3	3.3 Raw materials, chemical reaction, process description with flow diagram for manufacturing of soap by continuous process. Classification of soap on the basis of total fatty matter (TFM). Cleansing action of soap.	2	11/08/2026 to 13/08/2026			

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 3.4	3.4 Classification of soap on the basis of total fatty matter (TFM). Cleansing action of soap.	2	18/08/2026 To 18/08/2026			
			Practice test 3 MKCL Quiz 6	1	20/08/2026			**1 extra**
Unit - IV Manufacturing of Polymer								
4(8)	**CO-4**	**TLO 4.1**	4.1 Classification of polymers on the basis of origin, structure, molecular forces and method of preparation.	1	22/08/2026		Blackboard, Books, media, PPT	
		TLO 4.2	4.2 Raw materials, chemical reaction, process description with flow diagram for manufacturing of polyethylene by Zeigler process. Types of polyethylene. **MKCL Quiz 7**	2	25/08/2026 to 25/08/2026			**1 extra**
		TLO 4.3	4.3 Raw materials, chemical reaction, process description with flow diagram for manufacturing of polyvinyl chloride (PVC). Types of PVC.	2	27/08/2026 to 29/08/2026			
		TLO 4.4	4.4 Chemical reaction, process description with flow diagram for manufacturing of polyester from dimethyl terephthalate (DMT) and ethylene glycol (EG).	2	01/09/2026 To 01/09/2026			
		TLO 4.5	4.5Uses of polyethylene, PVC and polyester. **MKCL Quiz 8** **Practice test 4**	2	03/09/2026 to 05/09/2026			**1 extra**
Unit - V Manufacturing of Alcohol and Phenol								

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
5(10)	CO-5	TLO5.1	5.1 Introduction of fermentation, Types of fermentation.	1	08/09/2026		Blackboard, Books, media, PPT	
		TLO 5.2	5.2 Raw materials, chemical reaction, process description with flow diagram for manufacturing of ethanol from molasses.	2	08/09/2026 to 10/09/2026			
		TLO 5.3	5.3 Raw materials, chemical reaction, process description with flow diagram for manufacturing of ethyl acetate. **MKCL Quiz 9**	2	12/09/2026 to 15/09/2026			
		TLO 5.4	5.4 Raw materials, chemical reaction, process description with flow diagram for manufacturing of phenol by cumene process.	2	15/09/2026 To 17/09/2026			
		TLO 5.5	5.5 Raw materials, chemical reaction, process description with flow diagram for manufacturing of phenol by Raschig process.	2	19/09/2026 To 22/09/2026			
			Practice test 5 and MKCL Quiz 10	1	22/09/2026			
			Beyond Syllabus Topic.	1	24/09/2026			

ASSESSMENT METHODOLOGIES/TOOLS

A. Formative assessment (Assessment for Learning) (FA-TH)

- Continuous assessment based on process and product related performance indicators. Each practical will be assessed considering
  - 60% weightage is to process
  - 40% weightage to product

B. Summative Assessment (Assessment of Learning) (SA-TH)

- Continuous Assessment based on Process and Product related performance indicators. Each practical will be assessed considering
  - 60% weightage to Process
  - 40% weightage to Product

SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No.	Author	Title of Book	Publication
1	M. Gopala Rao and Marshall Sittig	Dryden's Outlines of Chemical Technology - For 21st Century	East-West Press (Pvt.) Ltd., ISBN-10: 9788185938790
2	George T. Austin	Shreve's Chemical Process Industries	Tata McGraw Hill Edition, ISBN-13: 9780070571471
3	P. H. Groggins	Unit Processes in Organic Synthesis	McGraw Hill Education (India) Private Limited, ISBN-13: 9780070852679

LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	https://archive.nptel.ac.in/courses/103/106/103106108/	NPTEL Course : Heavy and Fine Chemicals
2	https://onlinecourses.nptel.ac.in/noc24_ch09/preview	SWAYAM Course : Chemical Process Technology By Prof. Tamal Banerjee, IIT Guwahati
3	https://onlinecourses.nptel.ac.in/noc23_ch46/preview	SWAYAM Course : Organic Chemical Technology By Prof. Nanda Kishore, IIT Guwahati
4	https://www.trp.org.in/wp- Vol. 2-content/uploads/2016/11/AJSAT-No.1-Jan-June-2013pp.8-12.pdf	Asian Journal of Science and Applied Technology ISSN 2249 - 0698 Vol. 2 No. 1, 2013, pp.8-12

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

Mrs. A. B. Shaikh
(Name & Signature of Staff)

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