

<b>Name of Faculty</b>	:	Faculty of Engineering & Technology
<b>Name of Program</b>	:	Master of Technology (M. Tech)
<b>Course Code</b>	:	2MTE01
<b>Course Title</b>	:	Design Of Heat Exchangers
<b>Type of Course</b>	:	PC
<b>Year of Introduction</b>	:	2023-24

<b>Prerequisite</b>	:	Fundamentals about Heat Exchanger
<b>Course Objective</b>	:	To design, inspect, maintain and operate heat exchanger and professionally analyze their performance.
<b>Course Outcomes</b>	:	At the end of this course, students will be able to:
	CO1	Learn how to design common types of heat exchangers; namely shell-and-tube, tube and tube.
	CO2	Learn to select appropriate Heat Exchanger for the given application
	CO3	Learn to select appropriate Heat Exchanger for the given application.

#### Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				Total Marks
L	T	P		SEE	CIA	SEE	CIA	
03	00	02	04	70	30	30	20	150

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P – Practical, C – Credit, SEE – Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

#### Course Content

Unit No.	Topics	Teaching Hours	Weightage
1	Unit 1: Introduction Types of Heat Exchangers, definitions & amp; quantitative relationship.	5	10%
2	Unit 2 : Analytical & Numerical solution Procedures, Fouling factors, Correction factors	6	15%
3	Unit 3 : Design of Heat Exchanger Thermal & hydraulic design of Commonly used heat exchangers : Double pipe heat exchangers, shell and tube heat exchangers, condensers, Evaporators, Cooling and	15	30%

	dehumidifying coils, Cooling towers, Evaporative condensers , design of air washers, desert coolers ..		
4	Unit 4 : Design Standard Review of mechanical Design, TEMA Codes Materials of Construction, corrosion damage, Testing and inspection .	8	25%
5	Unit 5 : Heat Pipe Basics & its mathematical model , micro Heat Exchangers. Use of software in heat exchanger design	8	20%

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

#### Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Design of heat exchange equipment by using LMTD method.	02
2	Design of heat exchange equipment by using effectiveness- NTU method.	02
3	Design and analysis of double pipe heat exchanger with parallel and counter flow arrangement.	02
4	Design and analysis of shell and tube type heat exchanger.	02
5	Design and analysis of plate type heat exchanger.	02
6	Design of evaporator for refrigeration system.	02
7	Design of condenser for refrigeration system	02
8	Design of Plate Tube heat exchanger	02
9	Design of double pipe heat exchanger	02
10	Perform Parallel and Counter flow in a double pipe heat exchanger	02

#### Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Pin heat exchanger, Shell and tube heat exchanger
2	Plate Tube heat exchanger, double pipe heat exchanger
3	shell and tube type heat exchanger,

#### Suggested Learning Websites

Sr. No.	Name of Website
1	<a href="https://nptel.ac.in">https://nptel.ac.in</a>

#### Reference Books

Sr. No.	Name of Reference Books
1	Compact Heat Exchangers by Kays, V.A. and London, A.L., McGraw Hill
2	Heat Exchanger Design Handbook by Kuppan, T, Macel Dekker, CRC Press
3	Heat Exchanger Design Hand Book by Schunder E.U., Hemisphere Pub.



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4	Process Heat transfer by Donald Q Kern, McGraw Hil
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