

**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

<b>COURSE OUTLINE</b>			
<b>Course Title</b>	<b>CHEMICAL PROCESS SYSTEMS</b>		
<b>Course Code</b>	CL651 B	<b>No. of Credits</b>	3
<b>Department</b>	Chemical Engineering	<b>Faculty</b>	IYESWARIA.K. B
<b>Pre-requisites Course Code</b>	NIL		
<b>Course Coordinator(s) (if, applicable)</b>	NIL		
<b>Other Course Teacher(s)/Tutor(s) E-mail</b>	NIL	<b>Telephone No.</b>	9003106011
<b>Course Type</b>	Elective course		
<b>COURSE OVERVIEW</b>			
<p>This course is aimed primarily to introduce various chemical processes and modeling to students from circuit branches.</p>			
<b>COURSE OBJECTIVES</b>			
<ol style="list-style-type: none"> <li>1. To impart the basic concept of chemical process engineering.</li> <li>2. To understand the fundamentals of fluid mechanics.</li> <li>3. To understand the working of heat exchangers.</li> <li>4. To understand the working of large scale industrial processes such as distillation columns and reactors.</li> </ol>			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>		<b>Aligned Programme Outcomes (PO)</b>	
1. Understand basic concept of chemical process engineering		PO1, PO4, PO5, PO10.	
2. Get an idea of fundamentals of fluid mechanics		PO4, PO9, PO10, PO11.	
3. To understand working of heat exchangers and large scale industrial processes.		PO1, PO4, PO5, PO8, PO10, PO11.	

### COURSE TEACHING AND LEARNING ACTIVITIES

S. No.	Week	Topic	Mode of Delivery
1	Week - 1	Historical overview of chemical engineering- introduction to unit operations. Unit operations and unit processes and more recent developments	Chalk & Talk – (Black Board) BB
2	Week – 2	Chemical industry scope, features and characteristics and introduction to flowsheets and symbols for various operations	Chalk & Talk – (Black Board) BB
3	Week – 3	Material balance in simple systems involving physical changes and chemical reactions.	Chalk & Talk – (Black Board) BB
4	Week – 4	Forms of energy and optimum utilization of energy. Introduction to computer aided calculations.	Chalk & Talk – (Black Board) BB, PPT
5	Week – 5	Basic fluid concepts and types of flows and methods of analysis. Fluid statics, pipe flow and other physical transformation equipment.	Chalk & Talk – (Black Board) BB, PPT
6	Week – 6	Introduction to heat transfer and basic concept of heat exchange equipment.	Chalk & Talk – (Black Board) BB, PPT
7	Week – 7	Evaporators and their design principles.	Chalk & Talk – (Black Board) BB, PPT
8	Week – 8	Distillation and adsorption principles and their application.	Chalk & Talk – (Black Board) BB, PPT
9	Week – 9	Membrane process and conservation in process systems and industries.	Chalk & Talk – (Black Board) BB, PPT
10	Week – 10	Introduction to reactors and the design principles involved.	Chalk & Talk – (Black Board) BB, PPT
11	Week – 11	Drying, extraction processes involved in a chemical engineering industry.	Chalk & Talk – (Black Board) BB, PPT
12	Week – 12	Convection, natural and forced convection and their correlations.	Chalk & Talk – (Black Board) BB, PPT
13	Week – 13	Simple energy calculations in combustion reactions and their application in industries.	Chalk & Talk – (Black Board) BB, PPT

<b>COURSE ASSESSMENT METHODS</b>				
<b>S. No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Cycle Test - I	Week 5	1 hour	20%
2	Cycle Test - II	Week 10	1 hour	20%
3	Retest	Week 13	1 hour	20%
4	Assignments	---	----	10%
5	End Semester Exam	Week 17	3 hours	50% (Total = 100%)
<b>ESSENTIAL READINGS : Class notes and Callister (Materials Science book) is essential</b>				
<b>REFERENCE BOOKS</b>				
1	G.T.Austin,R.N.Shreve," Chemical process industries",5 th ed.,McGraw Hill,1984.			
2	S. K. Hajra Choudhury, "Material Science and processes", 1st Edn. , 1977. Indian Book Distribution Co., Calcutta.			
3	L.B.Anderson and L.A Wenzel," Introduction to chemical engineering",McGraw Hill,1961.			
4	H.S. Fogler, Elements of chemical reaction engineering,4 th Ed.,Prentice-Hall,2006.			

-3-

<b>COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)</b>	
1	Feedback from students during class committee meeting.
2	Anonymous feedback through questionnaire.
<b>COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)</b>	
1	Cycle Test – I and Cycle Test - II will be conducted in regular class.
2	Portions for Cycle Test - I are Unit – I and Unit – II (1st and 2nd paragraph of the syllabus.)
3	Portions for Cycle Test - II are Unit – III and Unit – IV (3rd and 4th paragraph of the syllabus.)

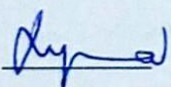
4	Student who have missed the first or second or both the cycle test (s) can register with the concerned faculty for the RE – TEST Exam which shall be conducted soon after the second cycle test, but before the End semester examination. The weight age for Retest is 20 % and time duration is 1 hour. The portions for Retest include both cycle test(s) portions.
5	50% Attendance is compulsory for writing the End Semester Examination.
7	Students who have less than 50 % of attendance have to redo subject.
8	Students who have failed in the semester examination with F grade, those completed mandatory classes and those have missed the end semester examination shall take reassessment (supplementary examination).
9	The passing minimum should be 40%.

**ADDITIONAL COURSE INFORMATION**

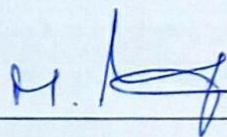
Faculty is available for discussion after the class hours in the Department of Chemical Engineering at Room No. 101 and can also be contacted through cell no. 9003106011. Queries may also be asked through the mail id [iyes@nitt.edu](mailto:iyes@nitt.edu)

**FOR SENATE'S CONSIDERATION**

Course Faculty



CC-Chairperson



HOD

