

**DEPARTMENT OF CHEMICAL ENGINEERING**  
**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

<b>COURSE PLAN – PART I</b>			
<b>Course Title</b>	<b>CHEMICAL PROCESS MODELLING AND SIMULATION LABORATORY</b>		
<b>Course Code</b>	CL 607	<b>No. of Credits</b>	2
<b>Course Code of Pre-requisite subject(s)</b>	NIL		
<b>Session</b>	August 2019	<b>Section (if, applicable)</b>	
<b>Name of Faculty</b>	Dr.M.Perumalsamy Dr.Nagajyothi Virivinti	<b>Department</b>	Chemical Engineering
<b>Email</b>	jyothi@nitt.edu	<b>Telephone No.</b>	9985329988
<b>Course Type</b>	<input type="checkbox"/> Core course <input type="checkbox"/> Elective course		
<b>Syllabus (approved in BoS)</b>			
Simulation will be carried out for the design and estimation of following using ASPEN PLUS and MATLAB softwares Physical and thermodynamic property estimations 2. Mass and Energy balances 3. Design of reactors 4. Design of distillation column 5. Design of heat exchangers 6. Design of absorbers  The course content includes flash drum design, dew point and bubble point calculation, shortcut and rigorous distillation column design, reactors design, reactive distillation column design, Dynamic modeling of Bioreactor's, CSTR, two tank liquid level system and shell and tube heat exchanger. Simulations will be carried out using MATLAB and ASPEN PLUS softwares.			
<b>COURSE OBJECTIVES</b>			
To understand and apply the principles and concepts of process design and mathematical modeling theory learned in the core chemical engineering course			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>	<b>Aligned Programme Outcomes (PO)</b>		
implement the numerical techniques to solve the problems of engineering interest	PO1, PO2, PO3, PO4, PO5, PO7, PO8, PO9, PO10		
use computational tools and commercial packages to solve process simulation problems	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO10		

**COURSE PLAN – PART II****COURSE OVERVIEW**

The Process Modeling and Simulation laboratory course is offered for PG Chemical engineering students in the first semester to understand and apply the knowledge acquired in process modeling and simulation theory course.

**COURSE TEACHING AND LEARNING ACTIVITIES**

S.No.	Week	Topic	Mode of Delivery
1	1 <sup>st</sup> week	Introduction to Steady state and dynamic simulation using MATLAB and ASPEN Plus	Presentation, Laboratory Experiment
2	2 <sup>nd</sup> week	Dynamic modeling of a CSTR using MATLAB	Laboratory Experiment
3	3 <sup>rd</sup> week	Dynamic modeling of a Bioreactor using MATLAB	Laboratory Experiment
4	4 <sup>th</sup> week	Dynamic modeling of a Interacting and Non-interacting liquid level system using MATLAB	Laboratory Experiment
5	5 <sup>th</sup> week	Dynamic modeling of a Shell and Tube Heat Exchanger using MATLAB	Laboratory Experiment
6	6 <sup>th</sup> week	Dynamic Modeling of a stirred tank heater using MATLAB	Laboratory Experiment
7	7 <sup>th</sup> week	Due point and bubble point calculation using steady state flash drum and Txy, Pxy diagrams using ASPEN Plus	Laboratory Experiment
8	8 <sup>th</sup> week	Steady state simulation of Flash drum using ASPEN Plus	Laboratory Experiment
9	9 <sup>th</sup> week	Shortcut distillation column design using ASPEN Plus	Laboratory Experiment
10	10 <sup>th</sup> week	Rigorous distillation column design using ASPEN Plus	Laboratory Experiment
11	11 <sup>th</sup> week	Design of Reactive distillation column using ASPEN Plus	Laboratory Experiment
12	12 <sup>th</sup> week	Steady state Reactor's (i.e, CSTR, PFR, Batch Gibbs) design using ASPEN Plus	Laboratory Experiment
13	13 <sup>th</sup> week	Redo Experiments	Laboratory Experiment
14	14 <sup>th</sup> week	Assessments	Laboratory Experiment



## COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Laboratory Experiment and Assessments	Every week	3 hrs	75%
		After 13 <sup>th</sup> week		
2	External examination		3 hrs	25%

## COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Performance in the assessment methods  
Questionnaire about the effectiveness of the experiments, topics and the knowledge gained

## COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

### MODE OF CORRESPONDENCE (email/ phone etc)

Students may contact the faculty over mail (jyothi@nitt.edu) or over whatsapp 9985329988

### ATTENDANCE

- A uniform attendance policy for all courses is recommended. **At least 75% attendance in each course is mandatory.**
- Students with **less than 75% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

### COMPENSATION ASSESSMENT POLICY

All the assessments are compulsory.

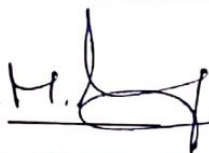
If any student fail to appear for laboratory experiments; they will be allowed to do the experiment at the end of 12<sup>th</sup> week.

### ACADEMIC HONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee constituted with the faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The policy against academic dishonesty shall be applicable for the current batches also.

### FOR APPROVAL

Course Faculty



CC-Chairperson



HOD

