DEPARTMENT OF CHEMICAL ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	CHEMICAL PROCESS MODELLING AND SIMULATION LABORATORY		
Course Code	CL 607	No. of Credits	2
Course Code of Pre-requisite subject(s)	NIL		
Session	August 2019	Section (if, applicable)	
Name of Faculty	Dr.M.Perumalsamy Dr.Nagajyothi Virivinti	Department	Chemical Engineering
Email	jyothi@nitt.edu	Telephone No.	9985329988
Course Type	☐ Core course	☐ Elective course	

Syllabus (approved in BoS)

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, due point and boubble point calculation, shortcut and regirious distillaton 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.

COURSE OBJECTIVES

To understand and apply the principles and concepts of process design and mathematical modeling theory learned in the core chemical engineering course

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
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 laborotary 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	1st week	Introduction to Steady state and dynamic simulation using MATLAB and ASPEN Plus	Presentation, Laboratory Experiment
2	2nd week	Dynamic modeling of a CSTR using MATLAB	Laboratory Experiment
3	3rd week	Dynamic modeling of a Bioreactor using MATLAB	Laboratory Experiment
4	4th week	Dynamic modeling of a Interacting and Non-interacting liquid level system using MATLAB	Laboratory Experiment
5	5th week	Dynamic modeling of a Shell and Tube Heat Exchanger using MATLAB	Laboratory Experiment
6	6th week	Dynamic Modeling of a stirred tank heater using MATLAB	Laboratory Experiment
7	7th week	Due point and bubble point calculation using steady state flash drum and Txy, Pxy diagrams using ASPEN Plus	Laboratory Experiment
8	8th week	Steady state simulation of Flash drum using ASPEN Plus	Laboratory Experiment
9	9th week	Shortcut distillation column design using ASPEN Plus	Laboratory Experiment
10	10th week	Rigorous distillation column design using ASPEN Plus	Laboratory Experiment
11	11th week	Design of Reactive distillation column using ASPEN Plus	Laboratory Experiment
12	12th week	Steady state Reactor's (i.e, CSTR, PFR, Batch Gibbs) design using ASPEN Plus	Laboratory Experiment
13	13th week	Redo Experiments	Laboratory Experiment
14	14th 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 13th 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 12th 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** _____