# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF CHEMICAL ENGINEERING
## NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI-620015

| COURSE OUTLINE | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Course Title** | **INTRODUCTION TO CHEMICAL ENGINEERING** | | | | | | |
| **Course Code** | **CLIR 15** | **No. of Credits** | **L** | **T** | **P** | **C** | |
| | | | 2 | 0 | 0 | 2 | |
| **Department** | **Chemical Engineering** | **Faculty** | **Dr. K.M.Meera Sheriffa Begum** | | | | |
| **Course Coordinator(s) (if, applicable)** | **Dr.K.M.Meera Sheriffa Begum** | | | | | | |
| **Other CourseTeacher(s)/Tutor(s E-mail** | **meera@nitt.edu** | **Telephone No.** | **0431-2503109** | | | | |
| **Course Type** | **Institute Requirement** | | | | | | |

### COURSE OVERVIEW

This course is offered in first semetser and with objective of understanding general idea about chemical engineering and its principles

### COURSE OBJECTIVES

To give a comprehensive knowledge on various aspects practiced in chemical engineering
To get an an idea about the sources of information on chemical engineering related topics.

### COURSE OUTCOMES (CO)

| Course Outcomes | Aligned Programme Outcomes (PO) |
|---|---|
| **COURSE OUTCOME**<br>Upon completing the course, the student will be able | |
| (i) To understand chemical engineering principles, acquire the capability to apply basic physics and chemistry principles in chemical engineering. | **PO1, PO2 ,PO3, PO5,PO8, PO9,PO11 and PO10**<br>**PO1, PO2, PO4, PO5, PO8, PO9,PO11 and PO12** |
| (ii) To integrate the data and formulate the mass and energy balance in chemical engineering problems. | **PO1, PO2,PO3, PO5, PO8, PO9, PO11 and PO12** |
| (iii) To use mathematical knowledge for solving chemical engineering problems with and without chemical reactions | **PO1, PO2,PO3, PO5, PO8, PO9, PO11 and PO12** |

### COURSE TEACHING AND LEARNING ACTIVITIES*(* : It is likely that some of the classes will be lost due to holidays and hence the semester will go upto 14 weeks)*

| S.No. | Week | Topic | Mode of Delivery |
|---|---|---|---|
| 1 | Week 1 | Overview of chemical Engineering | Chalk and talk |
| 2 | Week 1 | Introduction to Unit Operations | PPT, Chalk and talk |
| 3 | Week 2 | Introduction to Unit Processes | PPT, Chalk and talk |
| 4 | Week 2 | Development of Process Flow Sheeting | PPT, Chalk and talk |
| 5 | Week 3 | Physio-Chemical Calculations-I | PPT, Chalk and talk |
| 6 | Week 3 | Physio-Chemical Calculations-II | PPT, Chalk and talk |

| | | | |
|---|---|---|---|
| 7 | Week 4 | Tutorial Problem solving and discussion | PPT, Chalk and talk |
| 8 | Week 4 | Conservation Equations in Chemical Engineering | PPT, Chalk and talk |
| 9 | Week 5 | Principles and Applications of flow of Fluids-I | PPT, Chalk and talk |
| 10 | Week 5 | Principles and Applications of flow of Fluids-II | PPT, Chalk and talk |
| | | **Cycle TEST -I** | |
| 11 | Week 6 | Tutorial Problem solving and discussion | PPT, Chalk and talk |
| 12 | Week 6 | Principles and Applications of particle Mechanics-I | PPT, Chalk and talk |
| 13 | Week 7 | Principles and Applications of particle Mechanics-I | PPT, Chalk and talk |
| 14 | Week 7 | Tutorial Problem solving and discussion | PPT, Chalk and talk |
| 15 | Week 8 | Principles and Applications of Heat transfer-I | PPT, Chalk and talk |
| 16 | Week 8 | Principles and Applications of Heat transfer-II | PPT, Chalk and talk |
| 17 | Week 9 | Tutorial Problem solving and discussion | PPT, Chalk and talk |
| 18 | Week 9 | Principles and Applications of Mass transfer-I | PPT, Chalk and talk |
| 19 | Week 10 | Principles and Applications of Mass transfer-II | PPT, Chalk and talk |
| 20 | Week 10 | Principles and Applications of Mass transfer-III | PPT, Chalk and talk |
| 21 | Week 11 | Tutorial Problem solving and discussion | PPT, Chalk and talk |
| | | **Cycle TEST -II** | |
| 22 | Week 11 | Chemical Reaction Kinetics | PPT, Chalk and talk |
| 23 | Week 12 | Concepts of Scale up | PPT, Chalk and talk |
| 24 | Week 12 | Modeling and Simulation Techniques in Chemical Processes-I | PPT, Chalk and talk |
| 25 | Week 13 | Modeling and Simulation Techniques in Chemical Processes-II | PPT, Chalk and talk |
| 26 | Week 13 | Few Case studies: State of the Art Technology in Chemical Industries | PPT, Chalk and talk |
| | | Summary | |
| | | **Semester Examination** | |

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

| S.No. | Mode of Assessment | Week/Date | Duration | % Weightage |
|---|---|---|---|---|
| 1 | Assessment I | End of 5$^{th}$ week since commencement | 1 hour | 20% |
| 2 | Assessment II | End of 10$^{th}$ week since commencement | 1 hour | 20% |
| 3 | Assessment III | Tutorials | 50 minutes in the class | 10% (Average) |
| 4 | Compensation Assignment | After 12$^{th}$ week | 1 hour | 20% |
| 5 | Final Assessment* | At the end of Course | 3 hours | 50% |

***Mandatory; refer to guidelines on page 4**

**ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc**

1. S. K. Ghosal, S. K., Sanyal and S. Datta, Introduction to Chemical Engineering, TMH Book Company, 1998
2. Anderson L. B. and L. A. Wenzel, Introduction to Chemical Engineering, McGraw Hill Publications, 1998.

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

1. Feedback is to be collected thrice; At class committee meetings during the assessment period and one at the end of course as soon as classes are over.
2. The academic performance of the students will be assessed based on **Two** assessments by written test (each 20 marks), Assignment / Tutorials (10 marks) during the course and **One** final assessment (50 marks) at the end of course.

**COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)**

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

**Email :** meera@nitt.edu

**COMPENSATION ASSESSMENT POLICY**

**One Compensation assessment** will be conducted only for absentees in either the Assessments under Medical or Institute related activities.

**ATTENDANCE POLICY**(A uniform attendance policy as specified below shall be followed)

- **75% attendance in course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

**ACADEMIC DISHONESTY & 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 including the course 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 above policy against academic dishonesty shall be applicable for all the programmes.

**FOR APPROVAL**

Course Faculty: Dr.K.M.Meera S. Begum

CC-Chairperson: Dr.T.Sivasankar

HOD: 26/8/2019