Birla Institute of Technology and Science, Pilani – Pilani Campus
Instruction Division
First Semester 2016-2017
Course Handout (Part-II)

Date: 02/08/2016

In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course No. : **CHE F313**
Course Title : **Separation Processes II**
Instructor-in-Charge : **HARE KRISHNA MOHANTA**
Instructors (Tutorial) : **Priya C Sande, Hare Krishna Mohanta**

Course Description:
Chemical engineering operations such as size reduction, mechanical separation, filtration, crystallization, drying, adsorption, membrane separation processes etc.

Scope & Objective:
There are many physical operations that are common to many industrial processes. Each of these processes is classified according to their function without regard to the industry. Each such operation is studied as a unit operation. Some selected unit operations are dealt with in this course.

Text Book:
TB McCabe W. L., and Smith J. M., & Harriott P., *Unit Operations of Chemical Engineering*, 7th Ed., McGraw-Hill International Edition, 2006.

Reference Books:
RB Coulson J. M., Richardson J. F., *Chemical Engineering* (Volumes 1-6), Pergamon Press, London, 1978 & 1997.

Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Ref. to TB Chap.
1	Drying of Solids	Principles of drying	24
2	-do-	Cross circulation drying	24
3-5	-do-	Through circulation drying, dryers	24
6-12	Fixed bed separation	Adsorption	25
13	-do-	Ion Exchange	25
14	-do-	Chromatography	25
15-16	Membrane separation	Separation of gases	26
17-18	-do-	Separation of liquids	26

19-20	Crystallization	Introduction, crystal geometry, equilibria, super saturation, Nucleation Crystal growth, equipment Crystallizer design	27
Mid-Semester Test			
21-22	Properties & Handling of particulate solids	Characterization of Solid particles, properties of masses of particles	28
23-25	-do-	Storage and conveying of solids, mixing of solids, Mixers	28
26-28	-do-	Size reduction, equipment for size reduction	28
29	Mechanical separation	Screening, screening equipment	29
30-34	-do-	Basic Principles of Filtration , Batch and Continuous Filtration Calculations, Filtration equipments, Membrane filtration	29
35-36	-do-	Gravity Sedimentation processes	29
37-40		Clarifiers and Thickners, Design principles of Clarifiers and Thickners, Batch Sedimentation and Continuous Sedimentation, Centrifugal Sedimentation	29

Evaluation Scheme:

EC No.	Component	Duration (Minutes)	Weightage (%)	Date & Time	Remarks
1.	Mid-Semester Test	90	90 (30%)	<TEST_1>	CB (10%) +OB (20%)
2.	Tutorials (Best 7 out of 8)	-	70		CB/OB
3.	Surprise Tests (4)	-	20		CB/OB
3.	Comprehensive Exam.	180	120 (40%)	<TEST_C>	CB

Chamber Consultation Hour: To be announced in the class

Notices:
All notices concerning this course will be displayed in Nalanda Portal (***http://nalanda.bits-pilani.ac.in/***) and on the Chemical Engineering Notice Board.

Make-up Policy:
Make-up will be granted only for genuine cases.

Instructor-in-charge
CHE F313