0

Department of Chemical Engineering

Fine Chemicals Production (64473)

Total Credits	3

major elective

Prerequisites	-

Course Contents

The main objective of this course is to teach students the definition of fine chemicals products and to how distinguish between it and the commercial chemical industry. Course covers all reactors used in fine chemical industry concentrates mainly on batch reactors. Waste minimization and the environmental impact of a fine chemical product will be covered. Student will learn how to write a recipe for producing a fine chemical and scale it up to a production scale.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	An ability to apply knowledge of calculus, differential equation, numerical techniques, physics and basic engineering science to solve fine chemicals problems.	A	5 %
2	Design a batch process for fine and specialty chemical products.	C	12 %
3	Prepare a recipe of fine chemical products.	B	8 %
4	Design and prepare a fine chemical product.	B	14 %
5	Identify, formulate, &solve batch reactor and agitator power problems.	E	25 %
6	Understand the ethical responsibility towards the environment in terms of protection and waste minimization technologies and its impact on the fine chemicals industry.	F H	15 %
7	Communicate effectively in both writing and deliver oral presentation.	F G K	21 %

Textbook and/ or Refrences

1. Sharratt, P.N. (1997). Handbook of Batch process Design. (1st Edition). Blackie Academic &Professional. ISBN 075140369 5 (main text book) 2. Pollak, P. (2007). Fine Chemicals The Industry and Business. (1st Edition). Willey Interscience: John Wiley &Sons. ISBN 978-0-470-05075-0. 3. Prepared Handouts

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Projects	10 %
Final Exam	50 %

Course Plan

Week	Topic
1	Introduction &Definitions Nature of fine, specialty/effect chemical production. Economic factors, comparison with bulk/commodity chemicals.
2_3	Batch Process Design And Flowsheeting Introduction, batch process design, recipes, cycle times and occupation
4_6	Product Formulation: Soaps And Detergents First Midterm Exam
7_8	Agitation Agitator types, agitator selection, calculation of power requirements, estimation of agitator speed required for solid suspension, liquid/liquid contracting and gas dispersion, and estimation of heat transfer coefficients.

9_11	Batch Reactor Calculations/scale up Second Midterm Exam
11_13	Environmental Protection &Waste Minimization
14_15	Presentation of Project
16	Final Exam