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Department of Chemical Engineering	
Plant Design (64445)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Equipment Design (64442) OR Computer Aided Equipment Design (64444) P2 : Economy &Engineering Management (65301)

Course Contents

Students in this course acquire basic skills necessary for the design of chemical plants. Topics cover construction materials used in chemical plant building, erosion, mechanical properties, handling of materials and their selection, equipment symbols (codes) and drawings, ancillary services for unit operations, plant site and planning. Further, students learn about types of industrial waste and its control, industrial safety, maintenance, machine selections, precise machine plans, and piping. The course ends with an introduction to optimal selection for processes, compound and single variables, ways of exploration, linear and dynamic programming as well as different computer applications. Students are to submit a design report that includes capital and running cost of the plant as well as carrying out a sensitively analysis of the designed plant

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	To calculate material and energy flows in a chemical plant as well as to make appropriate assumptions to enable reaching a practical solution and assessing the validity of the solution and how it is impacted by the assumptions.	A	10 %
2	Utilize the collected market data in performing a feasibility analysis on the designed plant.	B	10 %
3	Develop appropriate strategies for identifying and solving engineering problems, including process designs and applications of engineering science	E	20 %
4	Select and size major equipment including integrated complex systems consisting of multiple unit operations and carry out cost estimation for entire system.	C	20 %
5	Consider the design constraints such as economic, health ethical, Safety &environmental, and social considerations.	F	10 %
6	Students should be proficient in the use of a variety of informational and traditional textbooks, scientific and technical journals and the internet	I	10 %
7	Grab communication, written and oral skills by preparing necessary technical report and presenting the results for colleagues &instructors.	G	10 %
8	Use the techniques, skills &modern engineering tools necessary for engineering practice design software: ChemCad, Hyssys, Expert Pipe flow	K	10 %

Textbook and/ or Refrences

Towler, R.K Sinnot, Chemical Engineering Design Principles, Practice and Economics of Plant and Process Design,2008, Elsevier Inc.

Assessment Criteria	Percent (%)
Mid. Term Exam	20 %
Projects	30 %

Presentation	10 %
Term Paper	10 %
Final Exam	30 %

Course Plan

Week	Topic
1	Introduction to design and general design considerations
2,3	Review of Material and Energy Balances
4,5	Flow sheeting and process selection
6,7	Understanding process variables
8,11	Cost estimation and feasibility study
11	Midterm Exam
12,13	Principles of equipment layout and site selection for plants
14	Introduction to Management
15	Oral Presentation
16	Final Exam