

Department of Chemical Engineering			
Computer Aided Equipment Design (64444)			
Total Credits	4		
major compulsory			
Prerequisites	P1 : Mass Transfer (64361) OR Mass Transfer Operations (64461)		
Course Contents			
<p>As the title indicates, the course provides the student with the basics principles of equipment design followed by application of well known chemical engineering computer design software such Chem CAD and HYSIS. Topics to be covered include chemical storage tank design a focus on high pressure vessels, cylindrical vessels, spherical methods of fabrication, and materials of construction, and reasons for vessels failure. A second design on Heat Exchanger (HE) will be followed. Students will learn how to determine the design parameter, how to calculate the heat exchanger area, optimum design of pipes in the heat exchanger with their layout, calculation the pressure drop of the HE. Finally the course will be ended with the design of a multi- component distillation column. Mass and Hydrodynamic</p>			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	At the end of the course students will be able to apply knowledge of momentum, heat and mass transfer in designing chemical equipment.	A	10 %
2	At the end of the course students will be able to carry out an optimum design of a piping system, heat exchangers and multi component distillation columns	C	35 %
3	At the end of the course students will be able to grab communication, written and oral skills by preparing necessary technical report and presenting the results for colleagues & instructors	G	10 %
4	At the end of the course students will be able to find information necessary for different equipments design and follow the progress	I	10 %
5	At the end of the course students will be able to follow up the advancement in chemical equipment used in chemical processes and chemical industry	J	15 %
6	At the end of the course students will be able touse the techniques, skills & modern engineering tools necessary for engineering practice (design software: ChemCad, Hyssys, Expert Pipe flow, water cad	K	20 %
Textbook and/ or References			
1- R.K Sinnot, Coulson & Richardsons Chemical Engineering, volume 6(Design), 4th edition, 2005. (main text book) 2- G. Towler, R.K Sinnot, Chemical Engineering Design Principles, Practice and Economics of Plant and Process Design, 2008, Elsevier Inc 3- Other related references			
Assessment Criteria		Percent (%)	
Mid. Term Exam		15 %	
Projects		25 %	
Presentation		5 %	
Term Paper		10 %	
Laboratory Work		20 %	

Final Exam		25 %
Course Plan		
Week	Topic	
1	Introduction to Design	
2-3	Equipment Selection	
4-7	Design of piping system	
8-12	Design of heat exchanger Midterm Exam	
13-15	Design of multi-component distillation component	
16	Final Exam	