



ChE 454: Computer application lab for Chemical Eng.

1 credit hour, 3 contact hour Lab, 1 credit hour Eng.

Instructor

Instructor: E.g. Salaheddin Aby Yahya

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Textbooks & References

A. Textbook

	Textbook 1
Title	Aspen HYSYS Manual
Author(s)	Salaheddin Abu Yahya
Publisher	
Year	2012
Edition	1 st edition

B. References

1. Seider, W.D., J.D. Seader, and D.R. Lewin, Product and Process Design Principles: Synthesis, Analysis, and Evaluation. New York: John Wiley & Sons, 2004
2. Computer-aided Process Simulation Modules in ChE Education Ali Almansooria , Salah Abu Yahyaa , and Ali Elkamela,b a Department of Chemical Engineering, The Petroleum Institute, Abu Dhabi b Department of Chemical Engineering, University of Waterloo

Specific Course Information

A. Course Catalog:

Hands on lab on process simulation using Aspen HYSYS, covering thermodynamics, fluid mechanics, reaction, separation, and economic evaluation.

B. Prerequisites or co-requisites

Prerequisites by topic: Programming, Unit operations

Co-requisites by course: CHE 472

C. Required/Elective or Selected Elective

Required

Objectives and Outcomes*

- 1) To introduce students to computer-aided process calculations and process simulations. [1,2,6]
- 2) To reinforce basic chemical engineering principles (thermodynamics, fluid mechanics, heat transfer, mass transfer, reaction kinetics) through process simulation. [2]

* Number in brackets refer to the Program outcomes

- 3) To give hands on experience with Aspen Plus covering the basics of the software capabilities and an overview of other advanced functionalities. [1,2,6]
- 4) To effectively communicate the outcomes the results of term project. [3]

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
30	30	10			30	

Relationship to Chemical Engineering Program Objectives

PEO1	PEO2	PEO3	PEO4	PEO5	PEO6
X	X	-	-	X	-

Topics Covered

1. Introduction to Process Flow sheet Simulation
2. Pumps, Compressors and Expanders
3. Heat Transfer Equipment
4. Separation Operations
5. Logical operations Adjust, Set, Balance and Recycle
6. Absorber
7. Distillation Columns
8. Reactors I
9. Reactors II
10. Complete Case Study

Evaluation

Assessment Tool	Expected Due Date	Weight
Quizzes	Weekly	30%
Performance	One week before the final	5 %
Mid Term Exam	After week # 5	25 %
Final Exam	According to department schedule	40%