

**KUWAIT UNIVERSITY**  
College of Engineering & Petroleum  
**CHEMICAL ENGINEERING DEPARTMENT**  
SECOND SEMESTER 2014 - 2015

**PLANT DESIGN (ChE 0640-491-02)**

<b><u>Instructor</u></b>	:	<b>Prof. M. R. Riazi</b> Office : 5 <sup>th</sup> floor, Bldg. 8 Kh. Tel. Ext. # 85772 (Dept. Direct # 24985599 or 24817662) Email: riazi@kuc01.kuniv.edu.kw
<b><u>Office Hours</u></b>	:	Daily except Monday and Wednesday (09:00 –11:00)
<b><u>Assistant</u></b>	:	Dr. Ghanima Al-Sharrah Room: 221 , Buld 21Kh Office Hours: Sun, Tues, Thurs : 10:00- 12:00
<b><u>Class Hours</u></b>	:	Monday & Wednesday (08:00-09:15)
<b><u>Place</u></b>	:	Bldg. 6 Kh., Room # 206
<b><u>Duration</u></b>	:	January 18, 2015 through May 22, 2015

**COURSE OBJECTIVE:**

This is one of the advanced courses in chemical engineering curriculum that all chemical engineers need to take before graduation. In this course students will use all aspects of chemical engineering such as unit operations, kinetics and reactor design, thermodynamics and materials and energy balances in design of a chemical plant with economical and environmental considerations. In addition to class lectures and assignments student will work on design of chemical plant through teams. As petroleum industries are the dominant industry in Kuwait most projects are in relation with design of plants in such industries. Student are also required to participate at the college exhibition at the end of the year as well as participating in design seminar to present their projects.

**Text Book(s):**

1. **“PLANT DESIGN AND ECONOMICS FOR CHEMICAL ENGINEERS”**  
by: Max. S. Peters and Klaus D. Timmerhaus –  
McGraw-Hill Int., New York, Jan. 2003.
  2. **“Unit Design and Operations in Petroleum Processing”**  
By : Riazi, Eser, Agrawalk and Pena Diez –  
ASTM Int., USA, Jan. 2013. Chapter 13  
Use code MNL58 in search of [www.astm.org](http://www.astm.org)
- Or see: [http://enterprise.astm.org/SUBSCRIPTION/DIGITAL\\_LIBRARY/MNL/SOURCE\\_PAGES/MNL58.htm](http://enterprise.astm.org/SUBSCRIPTION/DIGITAL_LIBRARY/MNL/SOURCE_PAGES/MNL58.htm)
3. ***Supplementary Reference:***  
**“Coulson & Richardson’s CHEMICAL ENGINEERING’**  
by: R. K. Sinnott – Butterworth-Heinemann, Volume 6, 3<sup>rd</sup> Edition, 1999.
  4. **Perry’s Chemical Engineering Handbook – McGraw-Hill**
  5. **INSTRUCTOR’S NOTES AND HANDOUTS**

## Grading:

The course grade will be based (approximately) on the following considerations:

Literature Survey for the Project	:	10% (Report and Oral Each 5%)
HYSYS and Energy/Material Balance	:	10% (Report and Oral Each 5%)
Units Design and Reporting	:	10%
Overall Final Report	:	20%
Oral Exam	:	10%
Overall Written Exam	:	20%
General student performance	:	8%
Class / Meetings Attendances	:	8%
Exhibition Project	:	4 %
Total	:	100%

## **COURSE OUTLINE**

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- 1. INTRODUCTION (Ch.1)**
- 2. DESIGN CONSIDERATION (Ch.2-3)**
- 3. REPORTING (Ch.11)**
- 4. COST ESTIMATION (Ch. 6)**
- 5. OPTIMUM DESIGN AND DESIGN CONSIDERATION (Ch.9)**
- 6. EQUIPMENT DESIGN AND COSTS (Ch.12)**
- 7. REACTOR DESIGN (Ch-13)**
- 8. HEAT TRANSFER EQUIPMENT DESIGN (Ch.14)**
- 9. DESIGN OF OTHER UNITS (Separators, Distillation, etc. )-Ch-15**
- 10. DESIGN OF SEPARATORS IN OIL PRODUCTION FIELDS**
- 11. SELECTION OF A THERMODYNAMIC MODEL IN PROCESS SIMULATORS**

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**Final Test: May 10, 2015: 11:00 - 13:00 pm.**