

# Lecture # 1

- **Course Syllabus**
- **Course Outline**

# Course Syllabus

**Course Title**

**CHE 425**

**Engineering Economics and Design Principles**

# Course Syllabus

## Instructor

- **Name:** Dr. Nadhir A. Al-Baghli
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- **Office Hours:** SMW 10.00-12.00.

# Course Syllabus

## Textbook

Richard Turton, Richard C. Baillie, Wallace B. Whiting, Joseph A. Shaeiwitz, “*Analysis, Synthesis, and Design of Chemical Processes*”, 2ndt Edition, Prentice Hall, 2003.

# Course Syllabus

## Reference Books

- 1) M. S. Peters and K. D. Timmerhaus, “Plant Design and Economics for Chemical Engineers”, 3rd ed., McGraw-Hill, 1991.
- 2) W. D. Baasel, Preliminary Chemical Engineering Plant Design, 2nd ed., van Nostrand Reinhold, 1990.
- 3) W.D. Seider et al, Process Design Principles, 1st. edition, 1999.

# Course Syllabus

## Objective

Understanding the Process flow diagrams (PFD). Structure and synthesis of PFD and their process conditions. Process economic analysis of chemical plants with particular emphasis on cost estimation, time value of money, depreciation, profitability and financial analysis, and methods for decision making among alternatives, Technical analysis of a chemical process and use of heuristics in design and analysis, and synthesis of a process using a simulator.

# Course Syllabus

## Course Outcome

Upon successful completion of this course, the students will be able to:

- 1) Interpret the process flow diagrams for any chemical process.
- 2) Justify chemical process conditions.
- 3) Use heuristics in process design and analysis.
- 4) Calculate the capital investment of a chemical process.

# Course Syllabus

## Course Outcome/ Continue

- 5) Estimate the manufacturing cost of an industrial plant.
- 6) Carry out profitability analysis of chemical processes.
- 7) Perform accurate and consistent analysis of engineering economic.
- 8) Use Simulation packages for equipment design.



# Course Syllabus

## Grading Policy

- Attendance and Class Participation 05 %
- Assignments 10 %
- Major Exam I 25 %
- Major Exam II 25 %
- Final Examination 35 %

# Course Outline

## Section # 0

*COURSE INTRODUCTION* (1 Lecture)

# Course Outline

## Section # 1

### *CONCEPTUALIZATION AND ANALYSIS OF CHEMICAL PROCESS*

- **Diagrams for Understanding Chemical Processes**  
(3 Lectures/Chapter 1)
- **Structure of and Synthesis of Chemical Process Flow Diagrams**  
(3 Lectures/Chapter 2)
- **Tracing Chemicals through the Process Flow Diagram**  
(3 Lectures/Chapter 3)
- **Understanding Process Conditions**  
(3 Lectures/Chapter 4)

# Course Outline

## Section # 2

### *ENGINEERING ECONOMIC ANALYSIS OF CHEMICAL PROCESSES*

- **Estimation of Capital Costs**  
(6 Lectures/Chapter 5)
- **Estimation of Manufacturing Costs**  
(6 Lectures/Chapter 6)
- **Engineering Economic Analysis**  
(4 Lectures/Chapter 7)
- **Profitability Analysis**  
(4 Lectures/Chapter 8)

# Course Outline

## Section # 3

### *SYNTHESIS AND OPTIMIZATION OF CHEMICAL PROCESSES*

- **Utilizing Experience Based Principles to Confirm the Suitability of a Process Design**  
(4 Lectures/Chapter 9)
- **Synthesis of the PFD from the Generic BFD**  
(2 Lectures/Chapter 10)
- **Synthesis of a Process using a s Simulator and Simulator Troubleshooting**  
(4 Lectures/Chapter 11)

# Course Outline

## Review and Exams

(3 Lecture)

- **Major Exam I**

Monday, November 10, 2008, 5:15 pm.

- **Major Exam II**

Monday, January 5, 2008, 5:15 pm.

*THANK YOU*