

# Ch. E. 453 = Chemical Process Analysis and Design - I

Instructor: DAVID C. DROWN - OFFICE: BEL 303 E-mail: ddrown@uidaho.edu

## COURSE OBJECTIVE:

Application of economic and optimization principles to industrial operations and processes.

- A. Develop an understanding of concept synthesis techniques.
- B. Develop an understanding of the economic principles and techniques by which designs are evaluated.
- C. Provide some optimization tools with which to obtain quantitative solutions to engineering design problems.

CATALOG DESCRIPTION: Estimation of equipment and total plant costs, annual costs, profitability decisions, optimization; design of equipment, alternate process systems and economics, case studies of selected processes.

**CREDITS: 3**

**PREREQUISITE: Ch.E. 330, Ch.E. 341, Ch.E. 423**

## COURSE WEB SITE:

<http://courseware.engr.uidaho.edu/che/drown/453-01/>

## TEXT:

Peters, Timmerhaus, and West Plant Design and Economics for Chemical Engineers, Fifth Edition, McGraw-Hill, Inc., 2003 ISBN 0-07-239266-5

or ISBN 0-07-119872-5 International Edition

## ORGANIZATION:

Homework - Due at the beginning of the assigned class period.

Format should be neat and progress in a logical sequence.

Results must be clearly distinguished and must have units indicated.

Method should be stated and equations used referenced.

All assumptions must be stated. All data not given in problem statement must be referenced. Late homework will be evaluated for right / wrong answers, but will receive ZERO grade credit.

Homework which cannot be EASILY understood will not be accepted.

EXPLAIN your calculations. At this level, written work is as much an exercise in COMMUNICATION as anything else.

Examinations - Three exams will be given in addition to the Final.

Each of the hour exams will consist of a set of open book problems.

The Final Exam *will* consist of a comprehensive exam (it *may* consist of two parts = closed & open book sections) during the official scheduled 2-hour exam period.

## GRADING CRITERIA:

Supplemental Project Problems . . . . . 23 %

Examinations:

Quizzes . . . . . 12 % (includes RAT's)

Three "hour" exams . . . . . 45 % (15 % each)

Final exam . . . . . 20 %

Curve distribution **A, B, C, D** at natural breaks **at or below 90, 80, 70, 60 %** scales.

**GRADING CRITERIA:** { *continued* }

**GRADE:** Note that the semester grade will be determined by your **ACTUAL PERFORMANCE** in this course. It will not be determined by your I.Q., your good intentions, your previous G.P.A., your scores on entrance tests, your good looks, etc.

**Homework** - Daily homework problems are intended to be a teaching and learning aid.

They will be graded on a numerical point scale with partial credit given when applicable. The average of all possible homework points will be calculated at the end of the semester and incorporated into the final grade on a **PASS/FAIL** basis.

A homework score of **70 %** or greater will be considered **PASS** and the course grade determined from the specified formula will be earned. A homework score between **55 %** and less than **70 %** will be considered **POOR** and the course grade will be **lowered by ONE LETTER**. A homework score below **55 %** will be considered **FAIL** and the course grade will be lowered by **TWO LETTERS!**

**Supplemental Project Problems** - Problems will be assigned periodically throughout the semester, sometimes as individual problems and other times as group projects. Each of these assignments will require a **FORMAL MEMO REPORT** { also known as an Executive Summary } summarizing the results and recommendations. Calculations and supporting work will be attached as individual named appendices. Up to *four separate* scores will be assigned covering the following topics :

1. Design Ideas - Innovation
2. Decision Judgment (assumptions, alternative selections, methods, etc.)
3. Technical Accuracy and Thoroughness
4. Communication (clear & concise, grammar, spelling, etc.)

These scores will be averaged to determine the overall report score. If a project is a group effort, the score will be shared equally between group members; however, individual responsibilities may be identified/ assigned and individuals within a group could receive very different scores.

Students having a **LEGITIMATE** reason for missing an exam are to notify the instructor **PRIOR** to the exam. If the instructor has not heard from a student missing an exam within 24 hours, it will be assumed that the student is planning to **DROP** the course. Make-up exams will not be the same exam as given in class, so it is to your advantage to take the regular exam.

**NO Ringing Cell Phones** - Ringing phones distract and disturb others in class.

1<sup>st</sup> time a cell phone rings audibly, the student will have 1 point deducted from semester average grade (100 point scale). 2<sup>nd</sup> time will lose 2 additional points, 3<sup>rd</sup> time 4 points, 4<sup>th</sup> and more time will deduct additional 5 points each time.

**How Children Fail** - John Holt

" It may help to have in our minds a picture of what we mean by understanding. I feel I understand something if and when I can do some, at least, of the following: (1) state it in my own words; (2) give examples of it; (3) recognize it in various guises and circumstances; (4) see connections between it and other facts or ideas; (5) make use of it in various ways; (6) foresee some of its consequences; (7) state its opposite or converse. This list is only a beginning; but it may help us in the future to find out what our students really know as opposed to what they can give the appearance of knowing, their **REAL LEARNING** as opposed to their APPARENT LEARNING."