CHEG 867 Process Systems Engineering: Mathematical Modeling and Optimization Principles

**Spring 2021**

# Locations

 Class In Class or Online following UD guidelines MW 5:00 pm – 6:15 pm

# Instructors

#  Marianthi G. Ierapetritou 223 Colburn mgi@udel.edu

Office hours: TBD

**Teaching Assistants:**

 **Chase Herman** cherman@udel.edu

 Office hours: TBD

# Textbooks

* ***Systematic Methods of Chemical Process Design (Strongly recommended)*.**

By L.T. Biegler, I.E. Grossmann, A.W. Westerberg.

Published by Prentice Hall, 1997.

* ***Nonlinear and Mixed Integer Optimization: Fundamentals and Applications (Strongly recommended)*.**

By C.A. Floudas. Published by Oxford University Press, 1995.

* ***Engineering Optimization: Methods and Applications***

By G.V. Reklaitis, A. Ravindran, K.M.Ragsdell.

Published by John Wiley & Sons, 1983.

* ***Model Building in Mathematical Programming***

By H.P. Williams. Published by John Wiley & Sons, 1990.

* ***Mathematical programming: theory and algorithms***

By M. Minoux Published by John Wiley & Sons, 1986

* ***Integer and combinatorial optimization***

By G.L. Nemhauser. Published by Elsevier, 1988.

* ***Selected papers from the literature***

**Course Description and Policies**

**Objectives**

The purpose of this course is to provide fundamental instruction on the mathematical programming techniques used in the solution of process design, synthesis and operations problems. This course will review techniques in optimization and mathematical modeling to study synthesis analysis, evaluation and optimization of process alternatives, process operations involving planning and scheduling, uncertainty considerations on process design and operations.

**Information**

The course will make use of CANVAS for posting of course handouts, homework solutions, grades, etc. However, please do not use e-mail or comments within CANVAS for communicating with the instructors or the TAs; the e-mail addresses given above should be used for that purpose instead.

**Homework**

**Problem sets should be handed in *before the start of class* on the due date; late hand-ins will not be accepted. A minimum of 50% of the maximum homework points is required to receive a passing grade in the course.**

*Answers handed in should have each problem starting on a new page,* the problems arranged in the proper numerical sequence, and all pages stapled together. Your name should be printed neatly in the upper right-hand corner of each page of your assignment.

You may choose to work on homework assignments individually or in groups. The impact of homework assignments on your grade is determined much more by the influence the experience has on your exam performance than by the numerical grade given to the homework problems. Make sure that you maximize your learning experience by balancing the extent to which you rely on group input versus your individual effort. If you work in a group, each member must prepare his/her own written answers based on the group discussion, and list all the members at the beginning of the problem.

**Make-up exams**

No make-up exams will be given, because they constitute a different exam taken at a different time by only a few students. If you have a valid excuse (according to University rules) to miss a midterm exam, the grade for the missed exam will be prorated such that the other exams will carry an appropriately increased percentage of your overall course grade. A note from the attending physician is required in case of medical excuses.

**Academic honesty**

The University has explicit rules on academic honesty (https://www1.udel.edu/stuguide/18-19/code.html) that will be strictly enforced.

# Grading Summary

Homework/Quizzes: 20%

 Exams: 2 (1 x 25, 1 x 25) 50%

 Project 30%

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 **Total 100%**