
UNIVERSITY OF CONNECTICUT
CE 4210: OPERATIONS RESEARCH IN CIVIL & ENVIRONMENTAL ENGINEERING
SPRING 2018 COURSE SYLLABUS

COURSE DAY/TIME: Tu/Th 9:30 – 10:45 AM **CLASSROOM:** JRB 204

INSTRUCTOR: Nicholas E. Lownes, Ph.D., P.E.
Office: CAST 301
Email: nlownes@engr.uconn.edu
Phone: (860) 486-2717
Office hours: Thursdays 1:00 – 3:00 PM & by appointment (email to set up time)

TEACHING ASSISTANT: Adrita Islam Email: adrita.islam@uconn.edu
Office hours: Mondays 3:00 – 5:00 PM
Office location: CAST 205

COURSE DESCRIPTION: Prerequisites: CE 2251, MATH 2110Q. Topics include modeling civil and environmental engineering problems; linear programming models and solution methods, integer programming models and solution methods, network flow models, critical path method for scheduling and managing engineering tasks and multi-criteria decision making.

COURSE OBJECTIVE: This course can be used to meet the professional requirements for the BS in Civil Engineering. The purpose of the course is to introduce students to operations research tools such as linear programming, integer programming, network analysis, and activity scheduling to problems and situations that are encountered in the design and construction of civil engineering projects.

WEBSITES:

HuskyCT: <http://lms.uconn.edu>

TEXT:

Taylor, B.W. *Introduction to Management Science*, 11th Edition, Pearson, 2013. ISBN 978-0-13-275191-9

COMMUNICATIONS: HuskyCT will be the center for communications for this course. Please check your email and the message board at HuskyCT regularly, as I will regularly post announcements.

GRADE SCALE

A	≥ 93%	C	73 – 76.9
A-	90 – 92.9	C-	70 – 72.9
B+	87 – 89.9	D+	67 – 69.9
B	83 – 86.9	D	63 – 66.9
B-	80 – 82.9	D-	60 – 62.9
C+	77 – 79.9	F	<60%

ELEMENTS OF COURSE AND CONTRIBUTION TO FINAL GRADE:

Homework 25%	Homework will be assigned and collected in 10 sets on the dates indicated on the syllabus. <u>No late homework will be accepted.</u> Homework assignments will be posted on HuskyCT. It is expected that homework is printed <u>neatly</u> or typed. Illegible homework will be considered incomplete. Your lowest homework grade will be dropped.
Mid-term Exam 25 %	There will be one mid-term examination.
Application Project 15%	There will be an individual application project that will require you to apply an OR model and solution method to a real-world problem. A proposal and final report are due when indicated on the schedule below. Details will be provided separately.
Final Exam 35 %	The Final Exam is comprehensive with the date TBD.

UConn Final Exam Policy: Final exam week for Spring 2018 takes place from Monday April 30th through Saturday, May 5th. Students are required to be available for their exam during the stated time. If you have a conflict with this time you must visit the Office of Student Services and Advocacy to discuss the possibility of rescheduling this exam. Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the exam schedule and over-sleeping are not viable excuses for missing a final exam. If you think that your situation warrants permission to reschedule, please contact the Office of Student Services and Advocacy with any questions. Thank you in advance for your cooperation.

Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships: The University is committed to maintaining an environment free of discrimination or discriminatory harassment directed toward any person or group within its community – students, employees, or visitors. Academic and professional excellence can flourish only when each member of our community is assured an atmosphere of mutual respect. All members of the University community are responsible for the maintenance of an academic and work environment in which people are free to learn and work without fear of discrimination or discriminatory harassment. In addition, inappropriate romantic relationships can undermine the University’s mission when those in positions of authority abuse or appear to abuse their authority. To that end, and in accordance with federal and state law, the University prohibits discrimination and discriminatory harassment, as well as inappropriate romantic relationships, and such behavior will be met with appropriate disciplinary action, up to and including dismissal from the University.

More information is available at <http://policy.uconn.edu/?p=2884>.

Sexual Assault Reporting Policy: To protect the campus community, all non-confidential University employees (including faculty) are required to report assaults they witness or are told about to the [Office of Diversity & Equity](#) under the [Sexual Assault Response Policy](#). The University takes all reports with the utmost seriousness. Please be aware that while the information you provide will remain private, it will not be confidential and will be shared with University officials who can help.

More information is available at <http://sexualviolence.uconn.edu/>.

CE 4210 SPRING 2018 SCHEDULE

CLASS	DATE	TOPIC	READINGS	DUE
1	Jan 16	Introduction to ORMS	Chapter 1	
2	Jan 18	Formulation & Graphical Solution	Chapter 2	
3	Jan 23	Linear Programming (LP)	Module A	HW 1
4	Jan 25	LP – Simplex Method	Module A	
5	Jan 30	LP – Simplex Method	Chapter 3	
6	Feb 1	LP Extensions	Chapter 3	HW 2
7	Feb 6	Introduction to GAMS		
8	Feb 8	Solving LPs using GAMS	Chapter 4	HW 3
9	Feb 13	Integer Programming (IP) - Models	Chapter 5	
10	Feb 15	IP – Graphical Solution	Chapter 5	HW 4
11	Feb 20	IP – Branch and Bound Method	Module C	
12	Feb 22	IP – Branch and Bound Method	Module C	HW 5
13	Feb 27	IP Extensions/Exam review		
14	Mar 1	The Transportation Model	Chapter 6	
15	Mar 6	The Assignment Model	Chapter 6	HW 6
16	Mar 8	MID-TERM EXAM		
	Mar 13	<i>Spring Break – No class</i>		
	Mar 15	<i>Spring Break – No class</i>		
17	Mar 20	Network Flow Problems - Concepts	Chapter 7	
18	Mar 22	Pseudocode	Supplemental	
19	Mar 27	Algorithm development/Complexity	Supplemental	HW 7
20	Mar 29	The Shortest Path Problem	Chapter 7	
21	Apr 3	The Minimum Spanning Tree Problem	Chapter 7	HW 8
22	Apr 5	The Maximum Flow Problem	Chapter 7	
23	Apr 10	Max Flow/Min Cut	Supplemental	HW 9
24	Apr 12	Min Cost Flow Problem	Supplemental	
25	Apr 17	Min Cost Flow Problem	Supplemental	HW 10
26	Apr 19	Multicriteria Decision Making	Chapter 9	
27	Apr 24	Multicriteria Decision Making	Chapter 9	
28	Apr 26	Additional topics/Exam review		Project
	TBD	FINAL EXAM		