

CEE 201 – SYSTEMS ENGINEERING AND ECONOMICS

Spring 2020

Meeting Times

Component	Section	Meeting time	Meeting place
Lecture	NP	TUE and THU, 9.30am–10.50am	1310 Newmark Civil Engineering Bldg
Office Hours	Instructor	TUE, 2.00pm–3.00pm	1212 Newmark
	TA1	MON, 3.00pm–4.00pm	B218 Newmark
	TA1	WED, 4.00pm–5.00pm	B218 Newmark
	TA2	WED, 2.00pm–3.00pm	B218 Newmark
	TA2	FRI, 10.00am–12.00pm	B218 Newmark

Course Information

Instructor: Professor Eleftheria Kontou
Email: kontou@illinois.edu
Course website: compass2g.illinois.edu
Office: 1212 Newmark Civil Eng Bldg
Office hours: TUE 2.00pm–3.00pm
Prerequisite: MATH 231; credit or concurrent registration in MATH 225.

Office hours are also available by appointment. Online office hours will also be provided before exams (specific time and day will be announced in the course’s website before the exams).

Teaching Assistants

TA1: Matt Carsello (mcarsel2@illinois.edu)
TA2: Vardhan Dongre (vdongre2@illinois.edu)

PrairieLearn Teaching Assistants

TA3: Amir Kazemi (kazemi2@illinois.edu)
TA4: Jianjia Zhang (jianjia2@illinois.edu)

Course Communication

All communication of announcements, assignments, and other materials will be done through the course website on compass2g.illinois.edu. You can also email the instructor and teaching assistants; when doing so, please begin your email subject line with [CEE 201]. This helps with class organization and will ensure a faster reply.

Required Textbook

Civil and Environmental Systems Engineering by ReVelle et al., 2004, 2nd Edition. Other **required reading assignments** will be given during each lecture, and the reading must be completed before the beginning of the next lecture.

Course Learning Outcomes

Upon completion of the course and all of its topics, students should have the abilities and tools to:

- formulate and solve civil and environmental engineering problems from a systems perspective.
- develop and use a set of engineering economics and systems analysis tools (including optimization and simulation models, life-cycle analysis, decision theory, critical path management, etc.) to solve civil and environmental engineering problems, and to appreciate their usefulness.
- understand sustainability issues in civil and environmental systems.
- gain appreciation for both the advantages and the limitations of mathematical models.

More specific objectives for each part of the course will be included in the lecture notes as the semester progresses. These objectives should be used as a study guide for what you are expected to be able to do on exams.

Exams

The three exams will be **tentatively** in-class closed book closed notes, unless announced differently prior to the exam date.

Homework assignments

Homework assignments will be announced and submitted online through the course website. **The deadlines will be end of day (Mondays before class 11.59pm)** unless otherwise posted. You are encouraged to work with other students on an assignment, however **copying violates the honor code and is not allowed under any circumstances**. If you use outside sources for a homework assignment (other book/textbook, scientific or other publication, website, etc.) please acknowledge it by citing the source. Assignments turned in after this time will be considered late. **Late homework assignments will be accepted with a penalty of 20%. No homework assignment will be accepted after one day from the day after it was due.** As an example, a homework assignment submitted the day after it was due will receive a maximum grade of an 80.

Formatting instructions are as follows: Strive for professionalism. Typewritten answers are preferred but clear handwritten answers will be accepted. Students are advised to box or underline their answers. Neatness and organization counts: if we cannot read or interpret your solution, then points will be deducted. Show all work done for the assignment, not just the answer. Make sure there is a section where your answer is clearly indicated, don't leave it to the interpretation of the reader to understand what your answer is. Provide a sentence or two discussing the answer: is it reasonable, is it unreasonable, what are reasonable values, does this value impose any problems that you can determine? Number each page of the homework assignment.

In Class Quizzes and iClicker Questions

In-class quizzes and iClicker questions will be given in **days selected by the instructor**. One of the purposes of these quizzes is to have a survey of class participation, which is strongly encouraged. **The quizzes and iClicker questions will NOT be announced ahead of time.** A correct iClicker answer will earn one point, while an incorrect one will receive 90% of the point. Students can request to be excused for an absence. They don't need to provide any proof for one absence. However, proofs are needed for absences beyond that. No make-up quizzes are going to be given and the quiz with the lowest score will be dropped.

PrairieLearn Quizzes

The tentative plan is to give **3 PrairieLearn quizzes** (dates are shown on the tentative syllabus included at the end of this document).

Re-grade policy

If you believe that an exam or homework assignment was graded incorrectly, please reach out to me at **the latest 2 days** after the announcement of the result. In your email requesting the re-grade, please add an explanation of where and why a re-grade is desired.

Attendance

Attendance is highly recommended. Important discussions, in-class quizzes, and iClicker questions will take place during class. Students will be responsible for all of the material taught in the classroom.

General Class Policies

- Be courteous and kind to others (including me and the teaching assistants!).
- Please silence your cell phones and other electronic devices.
- If you are using a laptop to keep notes during class, sit towards the back of the classroom.
- Do not arrive late for class. If you arrive after the class has started, sit towards the back of the classroom.

During classroom lectures and exercises you are encouraged to **ask questions and offer discussion**. However, side discussions between students are distracting to other students during lectures and formal demonstrations and will not be tolerated. Remember, while there are no specific grades assigned to good classroom etiquette, making a favorable or unfavorable impression through your classroom conduct could influence a borderline grade.

Grading Policy

A: [93, 100], A-: [90, 93), B+: [87, 90), B: [83, 87), B-: [80, 83), C+: [77, 80), C: [73, 77), C-: [70, 73), D+: [67, 70), D: [63, 67), D-: [60, 63), F: [0, 60).

The grading will be determined by the following weighting:

Homework Assignments	15%
iClicker and Quizzes	15%
Exam 1	15%
Exam 2	20%
Final Project	10%
Exam 3	25%
Total	100%

Tentative Lectures Schedule

Lecture	Date	Topic	Reading
1	Jan-21	Introduction	
2	Jan-23	Time Value of Money	14: 377-385
3	Jan-28	Cash Flow Series (1)	14: 386-392
4	Jan-30	Cash Flow Series (2)	14: 386-392
5	Feb-04	Choice between Alternatives	15: 403-411
6	Feb-06	Annual Cash Flow, ROR	15: 411-423
7	Feb-11	Depreciation (<i>tent PrairieLearn Quiz</i>)	16: 433-447
8	Feb-13	Taxes and Inflation, Personal Financial Planning	16: 448-481
9	Feb-18	Introduction to Model Building	1: 1-19
10	Feb-20	Linear Programming	2: 23-40
-	Feb-25	Exam 1 [Lectures Topics 1-8]	
11	Feb-27	Graphical Solution of Models	3: 43-55
12	Mar-03	Examples of Graphical Solutions	3: 55-67
13	Mar-05	Simplex Method & Sensitivity Analysis	4: 75-83, 96-107
14	Mar-10	Multi-Objective Optimization (<i>tent PrairieLearn Quiz</i>)	5: 121-128
15	Mar-12	Grand Objective Function	5: 121-128
16	Mar-24	Network Flow Problems	5: 128-139
17	Mar-26	Integer Programs (TSP, Facility Location)	6: 147-164
18	Mar-31	Branch and Bound (<i>tent PrairieLearn Quiz</i>)	7: 170-184
19	Apr-02	Heuristics & CPM	7: 187-201
20	Apr-07	Critical Path Method	8: 210-222
-	Apr-09	Exam 2 [Lecture Topics 9-18]	
21	Apr-14	Project Review, Resource Leveling	8: 222-236
22	Apr-16	Resource Leveling, Project Compression	8: 222-236
23	Apr-21	Decision Theory	9: 241-257
24	Apr-23	Decision Tree	13: 333-342
25	Apr-28	Utility Matrix	
26	Apr-30	Review	
-	May-05	Tentative Exam 3 [Lecture Topics all]	

Academic integrity

We will follow articles 1-401 through 1-406 of the Student Code (find the articles beginning here). This rule defines infractions of academic integrity, which include but are not limited to cheating, fabrication, and plagiarism. You are responsible for following these guidelines. If you have any questions about whether something would be an infraction, consult with the instructor before proceeding.

Request for special accommodations

To obtain disability-related adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 217.333.4603, email disability@illinois.edu, or go to the DRES website (at <http://disability.illinois.edu>).

Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight. Please consult this website for more information on emergency preparedness .

Updates to the syllabus

The contents of the syllabus and the policies described are subject to change. If that happens, all the changes will be announced and described on the course website.

Prepared by:
Last updated:

Prof. Ria Kontou
February 2, 2020