Iowa State University
Department of Industrial and Manufacturing Systems Engineering
IE 305 Section W5: Engineering Economic Analysis
Winter 2021

Class Time and Location: This class is delivered exclusively online from Monday, December 14, 2020 – Friday, January 21, 2021. Students can watch the videos and complete assignments at any time of the day.

Instructor: Dr. Cameron MacKenzie
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Teaching Assistant: Ally Aichinger   Email: allyaich@iastate.edu

Office Hours: There may be some formal office hours via Cisco Webex. If you want to meet with either the instructor or the TA, please contact us and we can set up a virtual meeting.

Text. *Contemporary Engineering Economics* 6th Edition by Chan S. Park. The course uses Immediate Access / RedShelf Course Materials which automatically enrolls you to receive digital access to the textbook. You **must opt out** if you do not wish to have access to the digital content.

Course content. The overall goal of this course is for you to be able to apply economic principles to make better decisions. The course will cover most of the material in Chapters 3-12.

Winter session: Since this course fits about 15 weeks of material into 6 weeks, we will be moving very quickly during the winter session. You will have approximately 2 assignments (i.e., testing modules, project) due each week. Do not wait until the last minute to attempt the testing modules. Plan to devote approximately 4-5 hours each weekday on reading, watching videos, and attempting the testing modules. The schedule of due dates is presented in the document on online testing modules.

Learning outcomes and course objectives.
- The student will be able to apply principles of time value of money in business, engineering, and personal economic decisions.
- The student will be able to compare projects/options using equivalence calculations and comparisons, and rate of return analysis.
- The student will be able to develop after-tax cash flows for a project.
- The student will be able to make engineering economic decisions with uncertainty and inflation and understand how risk impacts project valuation.

Testing modules. You will be assessed via online testing modules. **There are deadlines for passing the testing modules (roughly two modules per week).** You get exactly one opportunity to miss a deadline without it hurting your grade. The full instructions for the online testing modules can be found in a separate document on online testing modules.

Projects: There will be two class projects. Each project can be worked on individually or in a group of 2 people. The deliverable for each project will be a memo in which you or your group provides

recommendations for the proposed problem. Each project will have a due date. Your grade will be docked by 10% for each 24-hour period that the project is late.

Exams: There are no in-class exams or final exam.

Grading: Your final grade will be function of the number of testing modules that you pass and the average of your two scores on the project. Your class points will be calculated as:

Class points = 3.53*(number of testing modules passed) + 0.42*(average percentage score on projects)

Your class points will translate to a letter grade via the following scale.

Grade	Class points	Grade	Class points
A	60.00 and above	C	44.81 – 47.12
A-	58.95 – 59.99	C-	42.90 – 44.80
B+	55.03 – 58.94	D+	41.04 – 42.89
B	52.68 – 55.02	D	39.29 – 41.03
B-	50.22 – 52.67	D-	36.71 – 39.28
C+	47.13 – 50.21	F	36.70 and below

If you **pass fewer than 2 testing modules** or if you **average 40% or less on the two projects**, you will **fail the course**, regardless of how many class points you receive.

Readings: There will be required readings from the textbook. The reading assignments will replace video lectures on topics that the textbook describes well. You are responsible for learning the reading material. You are encouraged to ask questions about material that you read and do not understand.

Simulation: The course will use Excel. Module 7 introduces simulation as way to solve problems with uncertainty. I will use the software SIPmath. This software can be downloaded for free for Windows and Macs at https://www.probabilitymanagement.org/tools. You should download the software immediately in order to resolve any issues before we reach Module 7.

Use of Canvas: All videos will be accessed via Canvas. I will also be using Canvas to make announcements about the class. Videos of the class and Powerpoint slides can also be found on Canvas. It is highly recommended that you watch each video and take notes from the video in order to learn the material!

If you have a question that is appropriate for the entire class (e.g., questions about the testing modules or lectures), please post that question on Canvas in the discussion section, and either the TA or I will answer it there. If you have a question that is private, please email me.

Our commitment to you: I will do my best to teach you the material in the course and provide stimulating lecture videos. I will remind you of deadlines for the testing modules and the projects. The TA and I will respond to your questions quickly via email and on the Canvas discussion forum.

Academic Dishonesty: The class will follow Iowa State University's policy on academic dishonesty, and the IMSE Department has an expectation that all students will be honest in their actions and communications. Individuals suspected of committing academic dishonesty will be directed to the Dean of Students Office as per University policy. For more information regarding Academic Misconduct see http://www.dso.iastate.edu/ja/academic/misconduct.html.

Disability Accommodation: Iowa State University is committed to assuring that all educational activities are free from discrimination and harassment based on disability status. Students requesting accommodations for a documented disability are required to meet with staff in Student Accessibility Services (SAS) to establish eligibility and learn about related processes. Eligible students will be provided with a Notification Letter for each course and reasonable accommodations will be arranged after timely delivery of the Notification Letter to the instructor. Students are encouraged to deliver Notification Letters as early in the semester as possible. SAS, a unit in the Dean of Students Office, is located in room 1076 Student Services Building or online at www.sas.dso.iastate.edu. Contact SAS by email at accessibility@iastate.edu or by phone at 515-294-7220 for additional information.

Harassment and Discrimination: Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment. Any student who has concerns about such behavior should contact me, Student Assistance at 515-294-1020 or email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Religious Accommodation: If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and I will review the request. You may also seek assistance from the Dean of Students Office or the Office of Equal Opportunity and Compliance.

Contact Information: If you are experiencing, or have experienced, a problem with any of the above issues, email academicissues@iastate.edu.

Professionalism Statement: The IMSE Department has an expectation that all students will behave in a professional manner during all interactions with fellow students, faculty, and staff. Treating others with respect and having constructive communications are examples of being professional.

Prerequisite Requirement Policy: It is the policy of the IMSE Department to require all students enrolled in this course to have satisfied all of the course's prerequisite requirements. If it is discovered that a student has not met any applicable prerequisite requirements, he/she will be required to immediately drop the course. The failure to drop the course will result in a final course grade of 'F', regardless of course performance. Students who discover they have improperly enrolled in a course without meeting the applicable prerequisite requirements are strongly encouraged to meet with advising staff to promptly drop the course and make alternative scheduling arrangements or discuss if an official waiver of the prerequisite requirements may be applicable. **Math 166 Calculus II** is the prerequisite for this course.

Free Expression: Iowa State University supports and upholds the First Amendment protection of freedom of speech and the principle of academic freedom in order to foster a learning environment

where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.