ISYE 4311 Syllabus

Capital Investment Analysis, Section LI, 3 Credits

Fall 2026

Instructor Information

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General Course Information

Description

Students learn core concepts and techniques for economic decision and analysis of complex capital investment problems that involve dimensions of time, uncertainty and strategy.

Course Learning Outcomes

Upon successful completion of this course, students will be able to:

1) Calculate present values, future values, continuation values and account balances given a cash flow stream
2) Evaluate perpetuities and annuities
3) Compute effective interest rates and develop amortized loan schedules
4) Price risk-free assets
5) Estimate after-tax free cash flows
6) Evaluate embedded project options in an uncertain market
7) Understand the fundamentals of portfolio management
8) Construct minimum-variance portfolios, mean-variance efficient frontiers, and efficient portfolios
9) Calculate the required risk-adjusted expected return and apply it in portfolio management
10) Apply the Capital Asset Pricing Model and estimate the weighted average cost of capital

Required Course Materials

There is no required textbook. Lecture slides will be posted regularly and represent an integral part of the course. The course website on Canvas will be used extensively throughout the semester for distributions of various materials that will include the

syllabus, lecture slides, assignments, and announcements. This site will be continually updated. Students are expected to check it frequently.

The following sources may be useful as references. Earlier editions of the books are fine.

- Corporate Finance, 6th edition by J. Berk and P. DeMarzo. Pearson, 2023.
- Investment Science, by Luenberger, Oxford University Press, 1998.

Sharing course information with anyone not currently enrolled in this class is strictly prohibited.

Grading Policy

Each student will have an opportunity to earn a total of 400 points towards their final course grade (if grade components are added, deleted, or modified, the points will be adjusted accordingly). The final course grade will be computed based on the following components:

- Midterms (2, each worth 100 points), 50%
- Final Exam (100 points), 25%
- Review Exercises (4, each worth 20 points), 20%
- Participation Quizzes (10, each worth 2 points), 5%

Grade/minimum points required: A/360; B/320; C/280; D/240

Description of Graded Components

- *Midterms (200 points) and the Final Exam (100 points)*

Exams are individual efforts. There will be three exams: two midterms (each worth 100 points) and a final exam (worth 100 points). The midterms are not designed to be cumulative, but it should be clear that the materials covered later in the semester rely on materials covered earlier in the semester. The two midterms are in-class tests during the semester. The comprehensive final exam is 2.5 hours long and it is conducted during the institute's final exam period. There will be no makeup for any exams, except for institute approved absences.

All exams are closed-books, closed-notes, paper-based exams. One standard-size (A4) handwritten crib sheet (single-sided) is allowed at each exam.

Students are responsible for bringing a calculator with power functions and storage registers to all exams. Calculators must be computation-only devices with no internet capability. Cell phones may not be used as calculators.

- *Review Exercises (80 points)*

The general purpose of the review exercises is to strengthen students' understanding of course materials and skills, and to serve as preparation for the exams so that they are not surprising or overwhelming. There will be four review exercises. Each is worth 20 points and covers multiple classes of materials.

Review exercises are designated as individual work. Students are allowed to discuss them with friends, colleagues, AI-based assistants, the TA and the instructor. However, when preparing the submission of review exercises, students must do their own work.

Review exercises should be submitted electronically on the course website via file uploads in PDF and/or Excel format. A link to a document on a third-party platform is not an acceptable submission. The due dates are specified in a separate class schedule document. Late submissions are acceptable by 11pm on the last day of class instructions for this course (December 7, 2026). An accepted late submission will be penalized by an eight-point grade deduction.

- *Participation Quizzes (20 points)*

Ten participation quizzes, each worth two points, will be given in class on random dates, and they are due at the end of those classes. Their purpose is to encourage active learning and enhance problem solving skills. These quizzes are graded based on participation, not accuracy. Late submissions will not be accepted, except for institute approved absences.

Course Policies

Attendance and/or Participation

This is an in-person course. It has been shown that for most students, in-person attendance provides the best learning experience. Students are expected to attend the classes. Feel free to ask questions in class. You will receive the benefit of answers to questions asked by others in class. Keep in mind that participation quizzes are graded class activities. You are responsible for all materials presented in class, plus class discussions thereof.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodation for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Pre-Requisites

ISYE 3025 – Engineering Economy; ISYE 3232 – Stochastic Manufacturing & Service Systems; ISYE 3133 – Engineering Optimization

Makeup Exams due to Excused Absences

Please inform the instructor of your approved absences and discuss the time of the makeup exams in a timely manner. We only accept notifications from Dean's office or institute Approved Absences with the link to the on-line request form below: https://registrar.gatech.edu/info/institute-approved-absence-form-for-students.

Grade Appeals

Grade appeals should be presented in writing within one week after the grades are released. A grade appeal may result in the entire exam or assignment being regraded.

Use of Generative AI

While generative AI tools are now becoming a more integral part of how we derive knowledge, they are a two-edged sword. They can provide opportunities for learning, but they can also hamper self-learning if that new knowledge and learned concepts are not solidified for understanding, replication, and rigorous analysis. Such tools may also

interfere with the development of accurate knowledge since they tend to make up an answer when not knowing the answer.

In this course, the use of Generative AI tools should be considered parallel to collaboration with other people. You are welcome to talk about your work on review exercises, participation quizzes, and the topics covered in the course with students and peers as well as with AI-based assistants. But you are not allowed to share files posted on the course website with anyone outside this class or AI-based assistants.

In addition, all work you submit must be your own. You should never include in your work anything that was not written or computed or modeled directly by you without proper reference.

Student Use of Mobile Devices in the Classroom

Cell phone, tablet and/or computer use is permitted in class only if you are using the device to take notes or participate in a class activity.

Inclement Conditions

Campus closures or opening delays may occur due to inclement conditions. Exam dates and assignment due dates may be modified if, in the instructor's judgment, conditions impair successful student learning and performance.