

IEE 512 and IEE 412: Introduction to Financial Engineering

Course and Faculty Information

Course Description:

This course will be an intensive exploration course that will consist of three phases, Phase I will be a preparation phase in which the student will acquire on his/her own all the terminology and financial lingo to be used throughout the semester. Examples of the topics to be covered in this phase include from basics such as principles of corporations, definition of the different types of stocks, options, other derivatives, and financial ratios. The second Phase will introduce more advanced financial topics such as portfolio formation, assessment and traditional portfolio theory. In the third phase of the course we will explore Financial Engineering topics such as the application of stochastic models to stock and derivatives pricing and financial risk management.

This course focuses on the statistics, calculus, and methods used by engineers to mitigate financial risks.

Credits: 3

Prerequisites:

Prerequisites for IEE 512 and 412, undergraduate Financial Engineering, include IEE 300 with a C or better, IEE 380 with a C or better, MAT 342/343, and good Microsoft Excel skills including basic functions, regression, and linear algebra will be needed to complete the assignments and quizzes for this class. Students who do not have strong Excel skills should take the one credit hour IEE 320 Extreme Excel class prior to enrolling in IEE 512 and 412.

The short paperback book *All About Investing: The Easy Way to Get Started* is the initial required reading for the class to help the students prepare. It is recommended that the students read this book prior to the first day of class.

Instructor: Dan McCarville

Contact Info: BYENG 350, daniel.mccarville@asu.edu

Office Hours: See Canvas for Zoom Office Hours

Course Objectives and Learning Outcomes

Upon successful completion of the course the student will be knowledgeable in the following concepts and topics:

- Financial Terminology
- Theory of Interest
- Fixed Income Securities
- Statistical models in Financial Engineering
- Mean Variance Portfolio Theory
- The Capital Asset Pricing Model (CAPM)
- Forwards, futures and swaps
- Financial Engineering: Discrete Models
- Introduction to Financial Stochastic Models
- Advanced Option Pricing
- Real options
- Financial risk management.

Textbooks

Investment Science, 2nd Edition, 2015, David G. Luenberger, Oxford University Press

All about Investing: The Easy Way to Get Started, Esme Faerber, McGraw Hill

Additional documents will be assigned during the semester.

Course Access

Your ASU courses can be accessed by both my.asu.edu and myasucourses.asu.edu; bookmark both in the event that one site is down.

Computer Requirements

This is a fully online course; therefore, it requires a computer with internet access and the following technologies:

- PC (Windows) computer or Apple computer with the Windows operating system and Windows Excel preferred
- Desk top or laptop computer, not a tablet, iPad, or Chromebook
- Web browsers ([Chrome](http://chrome.google.com/), is recommended)
- Microsoft Office; 365 is free to students as well as the Windows operating system for Macs
- [Adobe Acrobat Reader](http://adobe.com/acrobat/reader) (free)
- Webcam, microphone, and speaker
- Microsoft Office ([Microsoft 365 is free](http://microsoft.com/365/free) for all currently-enrolled ASU students)
- Reliable broadband internet connection (DSL or cable) to stream videos.
- Zoom (provided by ASU)
- Good and reliable internet connection

Note: A smartphone, iPad, Chromebook, etc. will not be sufficient for completing your work in this course. While you will be able to access course content with mobile devices, you must use a computer for all assignments, quizzes, and virtual labs.

Course Structure

this course is entirely online. This course will use pre-recorded lectures as identified in Canvas. Canvas is setup with weekly modules identifying the lectures to be covered each week along with assignments and exams.

Student Success

To be successful:

- check the course daily
- read announcements
- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers
- create a study and/or assignment schedule to stay on track
- access [ASU Online Student Resources](#)

Grading

Your grade will be determined based on the following grading schema:

Grade	Percentage
A	≥ 90 to 100%
B	≥ 80 to $< 90\%$
C	≥ 70 to $< 90\%$
D	≥ 60 to $< 90\%$
E	$< 60\%$

"Y" grades are not an option for this class, unless an ASU policy requiring this option is provided by the Provost's Office to ASU faculty this semester. If you are falling behind in the class due to medical issues or personal issues, please contact your advisor and the instructor. An "I" grade (Incomplete) might be provided. This grade will be changed to a letter grade when the missing work is completed per the agreement with the instructor.

Submitting Assignments

All assignments, unless otherwise announced, MUST be submitted to the designated area of Canvas. Do not submit an assignment via email.

Assignment due dates follow Arizona Standard time. Click the following link to access the [Time Converter](#) to ensure you account for the difference in Time Zones. Note: Arizona does not observe daylight savings time.

Grading Procedure

Grades reflect your performance on assignments and adherence to deadlines. The course grade will be determined based upon the total points each individual students achieves in the following categories:

Graded Excel Homework	200 points
Portfolio Project (IEE 512 Graduate Students Only)	100 points
Exam #1	100 points
<u>Exam #2</u>	<u>100 points</u>
Total Available Points	400 points IEE 412 Undergraduate Students
Total Available Points	500 points IEE 512 Graduate Students

Assignments

We have graded and ungraded assignments. The answers for the ungraded assignments (textbook problems) are provided in our course website.

The graded assignments will require Microsoft Excel to complete. Students who have limited experience using Excel should complete IEE 320 Extreme Excel, or another Excel class prior to enrolling in this class. These assignments can be difficult and require fairly advanced Excel tools. These graded Excel assignments must be completed individually. The assignments have unique data to each student that is traceable. Other means have been implemented in the assignment to identify other sources, copying and pasting from other students or the provided examples. I want each of you to understand financial engineering and learn how to apply the tools. I don't want you to simply learn how to copy and paste in Excel! You can certainly ask your fellow student who are enrolled in this class to help you understand the problems and Excel functions. The work you submit must be your own.

IEE 512 Graduate Students must also complete Portfolio Project Assignments, which consists of a thorough technical analysis, portfolio optimization, and portfolio results and risk analysis.

Assignment due dates follow Arizona Standard time. See the Time in AZ link in our Canvas menu to ensure you account for the difference in Time Zones. Note: Arizona does not observe daylight savings time.

Exams

The exams are closed book and closed note. One 8.5x11 inch hand written "cheat sheet" with written notes on both sides can be used during the exams. Pencils and an eraser are also required. A non-programmable calculator can be used. Cell phones, tablets, computers, and programmable calculators are NOT allowed during the exams.

The exams in this class may contain multiple choice, short answer, and mathematical problems. The exams are based on the reading assignments including both books and various articles and documents, lectures, graded assignments, ungraded assignments, and any additional materials provided to the class. I urge students to attend all lectures. Verbal discussions that are not written in the slides are popular items to be included in the lectures.

An online proctoring service is used for the exams in this class. Students will need a webcam that is either integrated with their laptop monitors, or connected to their computers. A constant reliable internet connection will be needed. Students will need a scanner either connected to the computer prior to starting the exam, or a cell phone app such as Genius Scan. Cell phones are not permitted during the exam, but can be accessed once the exam has been completed to be used for scanning answer sheets.

To help improve the quality of education at Arizona State University, and assure that the degrees earned by our engineering students are based on the highest ethical standards, the following requirements for taking a McCarville exam are as follows:

1. We will be using an online proctoring service. You will need a web camera on your computer, or connected to your computer. These can be purchased for approximately \$25 from Amazon.
2. Do your own work. No teamwork or discussions of any type are acceptable during the exam.
3. Bring a non-programmable calculator. Do not plan to use your phones for calculations. The online proctoring service used for this class provides a scientific calculator. You can try it out in the RPNOW Practice Exam. You can not use a programmable/graphing calculator such as a TI-83, TI-84, TI-89, TI-N'spire, or any of the more expensive programmable/graphing calculators.
4. Place your cell phone in your backpack, purse, book bag, or pocket. You can NOT use your phone at all during the exam. Any observed phone, for any reason while taking the exam, is a violation.
5. You can not use the internet during the exam, other than access to the proctor and the exam on our class website.
6. You can not have multiple monitors running during the exam. This creates problems for the proctor, so it will be reported as a violation.
7. Any electronic device such as a dictionary or translator must be approved by me prior to starting the exam. No device with transmitting capabilities or a camera will be allowed.
8. The exam is the property of Arizona State University and Dan McCarville. It can NOT be copied or distributed. No Screen Shots. Do not give it to a friend.

Violations to these requirements as well as those identified in ASU's Academic Integrity Policy will be processed as required by this policy. See the Academic Integrity section below. I sincerely appreciate your help with my efforts to improve your education experience, and enhance your career opportunities.

Late or Missed Assignments

Accommodations will be made for religious observances provided that students notify the instructor at the beginning of the semester concerning those dates. Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences.

Notify the instructor BEFORE an assignment is due if an urgent situation arises and the assignment will not be submitted on time. Published assignment due dates (Arizona Mountain Standard time) are firm. Please follow the appropriate University policies to request an accommodation for religious practices or to accommodate a missed assignment due to University-sanctioned activities.

Due dates for classwork are on the class schedule. All work is due on the scheduled date. Late work will not be graded, and you will receive a score of "0".

The only excuses accepted for a missed exam or homework assignment are as follows:

1. Religious holiday/event as identified and approved by ASU
2. ASU sanctioned athletic/band event for our athletes and corresponding band students
3. Death of an immediate family member (parent, grand parent, brother, sister, child)
4. Hospitalization
5. US Military deployment

My general process for excused missed exams and assignments will not include a make up exam. Rather, the final exam will be weighted more to compensate for the missed exam. Missed exams and assignments that are not excused will receive a zero grade.

Excused absences related to missed class due to military line-of-duty activities that are in accord with [ACD 304–11](#), “Missed Class Due to Military Line-of-Duty Activities,” and SSM 201–18, “Accommodating Active Duty Military”.

Academic Integrity

In addition to the rules stated in this syllabus regarding assignments and exams, students in this class must adhere to ASU’s academic integrity policy, which can be found at <https://provost.asu.edu/academic-integrity/policy>). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity [Honor Code](#) and the Fulton Schools of Engineering [Honor Code](#). All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Copyright

All course content and materials, including lectures (Zoom recorded lectures included), are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see [ACD 304–06](#), “Commercial Note Taking Services” and ABOR Policy [5-308 F.14](#) for more information).

You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement. Providing any course materials to friends, family, boards, websites is considered a copyright violation and an academic integrity violation.

Communicating With the Instructor

Community Forum

This course has a discussion board available in the class website for students to discuss particular problems or course content. The instructor will not be paying much attention to this discussion board, so please do not provide specific questions for the instructor.

Students are encouraged to ask questions during office hours. The class website has a message system students can also use to ask questions to the instructor.; students can expect a response within 72 hours or so.

Email

ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly. Students must send emails to faculty from their ASU email account rather than a personal account.

All instructor correspondence will be sent to your ASU email account.

Other Course Policies

View the [ASU Online Course Policies](#)

All students in this class are subject to ASU's Academic Integrity Policy which is available at the following link:

<https://provost.asu.edu/academic-integrity/policy>

Students should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. All violations will be reported to the Dean's office, who maintain records of all offenses.

All students must wear face coverings in classrooms, labs, offices, and community spaces.

Disability Accommodations

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

Harassment and Sexual Discrimination

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

Mandated sexual harassment reporter: As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.

Policy against threatening behavior, per the Student Services Manual, [SSM 104-02](#)

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services. Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations

of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

Accessibility Statements

View the [Accessibility section](#) in the class website to review accessibility statements for common tools and resources used in ASU Online courses.

Syllabus Disclaimer

The syllabus is a statement of intent and an agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Remember to check your ASU email and the course site often.