MGT/MGP/MGB 261: Investment Analysis

Daytime MBA: Th 12:10p.m. - 3:00 p.m.   Location: 1302 Gallagher   (CRN: 41607)
Sacramento MBA: Th 6:00p.m. - 9:00 p.m.   Location: 2206 UCDMC Ed Build'g (CRN: 41567)
Bay Area MBA: Fr 2:00p.m. - 5:00 p.m.   Location: 1504 Bishop Ranch   (CRN: 41549)
                          Sa 9:00a.m. - 12:00 p.m.

Contact Information

Instructor: Joe Chen
Office: 3216 Gallagher Hall
Office Hours: Thursdays 3:00pm-4:00pm (or by appointment)
e-mail: chenjs@ucdavis.edu
Course website: on Canvas (http://canvas.ucdavis.edu)

Course Objectives

The objective of this course is to study theory and empirical evidence relevant for portfolio management. An emphasis is placed on understanding how an investment professional would allocate funds in a hypothetical portfolio. Major topics include estimation of capital market parameters, trade-off between risk and return, optimal portfolio selection, equilibrium asset pricing models, and delegated portfolio management. Emphasis will be put on development of techniques that should be part of the tool kit of those interested in becoming professional investors and/or researchers in finance. This course is designed to primarily address the needs of advanced students in an MBA program.

Prerequisites

- I will assume a good understanding of **basic notions in finance**: the time-value of money; return, risk and portfolio diversification; net present value; etc. These are materials covered in MGT/P/B 205 (core finance class). I will discuss some of these topics in class, but I expect you to refresh your memory on them at the very beginning of the quarter. Spending time in class to review topics that are covered by more basic courses would be inefficient and, most importantly, would take time away from new and more exciting topics. I assume that you are in this class to learn new material and get ready for the job market and I will teach the course accordingly.

- Uncertainty is what makes the study of financial markets fascinating. If there were no uncertainty there would be very few job opportunities on Wall Street! Unfortunately, uncertainty also makes our task more difficult. The good news is that you will finally understand why you had to study statistics. No serious study of portfolio and risk management can be undertaken without solid **knowledge of statistics**. You should have covered these materials in MGT/P/B 203 (core statistics class). For this reason, I expect you to make a serious effort to refresh your memory on some essential concepts such as descriptive statistics, inference techniques and basic regression analysis. Any introductory book in statistics should help you to get up to speed.

- A mathematical approach is necessary to avoid superficiality for many of the topics covered by this course. We will assume a good **knowledge of mathematics**, such as linear algebra and calculus. I am not a fan of technicalities per se, but I hope that by the end of the semester you will appreciate how the use of technical tools is important to make this a useful course.

- If you are planning to work in the area of investment management, it is essential that you develop your computer skills. I will assume that you know how to use spreadsheets to perform some basic analysis. I will assign problem sets that require a **proficiency of computing** skills, such as the use of Microsoft Excel. Moreover, various course exercises may rely on computer technology which may include, but not limited to, the use of emails, videos, webcasts/webinars and web-conferencing.

Grading Criteria, Exams, Assignments and Course Policy

Grading Criteria

The course grade is based on the following criteria:

Assignments (5)	25%*
Bi-weekly quizzes (5)	30%*
Course Project	35%
Participation	10%

* For the purpose of grading, you are allowed to drop your lowest scoring. Similarly, you are allowed to drop your lowest quiz score.

Course Groups

- Teamwork is a critical skill to be developed in investment management. Each class participants are to form into **groups of 2 to 4 students**. If you have problems creating groups or finding enough members, one will be assigned for you.

- Name your group with business name appropriate for an investment company. Eg. "Aggie Inv't Co."

- All assignments and the course project must be done in groups.

Assignments, Exams, Course Policy, and Office Hours

- **Assignments:** I will assign homework problems on a regular basis, which are to be done in **groups**. There will be a total of **5 assignments – the first assignment due on the first meeting**. Submit one write-up for the entire group, being careful to note all the names of group members and the section number.

  Hard copies are preferred, but properly formatted electronic copies in PDF may also be submitted via the course website. Any documents submitted electronically must be properly *formatted for printing* – supporting documents should be provided as separate non-printing pages. Unformatted MS Words or MS Excel files will not be accepted. Late assignments are NOT acceptable.

- **Quizzes:** The quizzes are **closed book and closed notes**. You are not allowed to use any notes or "cheat sheets". We will allow the use of non-programmable calculators during the exam.

- **Makeup Quizzes:** There will be no makeup quizzes. Any missed quizzes or assignment not turned in will receive a credit of zero and included in the computation of the final grade. By registering for this class you are committing, among other things, to take quizzes on the scheduled dates. However, the grading critieria already takes into account the possibility that you might miss a quiz or an assignment due to other obligations.

- **Course Project:** There will be *one major project* dealing with asset allocation. We will be working on this project throughout the term, with sections due intermittently. We will apply the portfolio choice and diversification theory from class to some actual real-life scenarios. Extensive use will be made of Excel (or any other mathematical package). The project must be done in your groups.

  Furthermore, the project will involve presentation components. Each group must also prepare one 10 minute Powerpoint presentation on a portion of the project due as the course progresses (see course schedule). You may sign up for presentation slots as soon as groups are formed.

- **Office Hours:** If you have any questions about the material covered in class please do not hesitate to see me. Please send me an e-mail to schedule an appointment (but please do not ask for an appointment for a time within 24 hours) or during office hours. Dropping in without an appointment outside of office hours is highly discouraged (except in emergencies). If you have problems keeping up with the material, do not wait hoping that things will get better. They will probably get much worse. Remember that the reason why you enrolled in this course is to learn some finance, not to *survive* through the course.

- **Research Travel:** UC Davis is a world-renowned research institution. The advantage of studying under our faculty is that you will be exposed to up-to-date leading research in finance (materials not found in any textbook). The disadvantage is that the faculty is sometimes required to share the ideas developed here with other research institutions and will periodically be unavailable on campus.

- **Tent Cards:** Classroom participation and interaction is an integral part of the learning experience. To facilitate this, students are expected to bring a tent card to every class session and place it visibly.

- **E-mail and Course Discussions:** Open discussion of course materials is an integral component of the learning process – both in the classroom and outside. To facilitate open discussions, responses to questions posted via e-mail maybe forwarded to the entire class if it is of appropriate nature.

- **Additional Course Materials:** Homework assignments, solutions, additional readings, and all other additional course materials will be posted on the course web page. **You are responsible for timely downloads of the materials from the course web page.** I will also provide copies of my lecture notes on the course web page by the evening before the lecture.

- **Calculators and Computers:** The nature of the subject matter requires significant amount of numerical computations. Students are expected to bring a calculator to every class session and to all examinations. Moreover, use of laptop computers in the classroom may be necessary.

- **On-line Content:** The course may (or may not) include the use of Internet-based online educational tools. The tools may include technologies such as online-videos and other contents, webinars, web-conference, and otheres. Students are expected to be proficient with using such technologies when necessary.

Textbooks and Additional Readings

Textbooks

- Required:
  Investments, 10th Edition (referred to as **BKM** hereafter)
  Authors: Zvi Bodie, Alex Kane, and Alan Marcus
  Publisher: McGraw-Hill/Irwin

  Digital versions and international/global editions are acceptable.
  Older editions are also acceptable – but you will be responsible for following any changes in page numbers.

Additional Readings

- Required:
  A course reader (textpak) with copies of HBS cases will be assigned.
  Additional required readings may be assigned and provided electronically.

Tentative Course Outline and Assigned Readings

This is a tentative course outline and assigned readings: **topics and assigned readings are subject to change**.

1. Overview of Portfolio Management

We classify the main types of financial markets, and introduce the basic securities traded on them. We then discuss the different exchanges in which securities are traded, the typical positions taken and the costs associated with trading. We discuss some of the practical aspects of investment decision-making and introduce the process of portfolio management. We also study the industry of active portfolio management, such as mutual funds, pension funds and hedge funds. This section summarizes the basic institutional details we need to know when discussing the main themes of the investment process for equities.

> *Required Reading: BKM, Chapters 1.1-1.5, 28.1-28.3*
> *Optional Reading: BKM, Chapters 2.1, 2.3, 2.4, 4.1-4.4, 4.6, 28.4-7.*

2. Quantitative Review and Capital Market Assumptions

We review some basic concepts of statistics and probability theory: namely, means, standard deviations, variances, covariances and correlations. We discuss estimating these statistical moments using historical samples, as well as running and interpreting regression analysis. We also consider how to mathematically represent returns and portfolio holdings as to account for cash deposits and loans, margin accounts and short-selling.

> *Required Reading: BKM, Chapters 3.8-3.9, 5 (all).*
> *Optional Reading: BKM, Chapters 17.2, 17.5*

3. Portfolio Mathematics and Optimal Portfolio Choice

We first introduce the notions of risk and portfolio diversification and discuss how to compute important descriptive statistics for portfolios of assets. We use Markowitz's approach to portfolio formation to show how investors can take advantage of the correlation structure among assets to generate an investment opportunity set that dominates (in a reward-to-risk sense) any of the individual assets taken in isolation. We show how to construct the best set of attainable portfolios and provide precise measures for the benefits of portfolio diversification. We also discuss how different attitudes towards risk affect the composition of the portfolio held by each investor.

> *Required Reading: BKM, Chapters 6 (all), 7 (all), 25.1, 25.2 and 25.3.*
> *Optional Reading: BKM, Chapters 25.4 and 25.5.*

4. Equilibrium Asset Pricing Models

We assume that the investors are rational and, therefore, optimize their portfolio holdings according to their preferences, subject to their budget (and possibly some institutional) constraints. Using this approach we derive the Capital Asset Pricing Model (CAPM) and discuss its implications for asset pricing and investment-decision making. We then assume that assets returns are generated by a finite number of factors and all arbitrage opportunities are exploited, which lead to the Arbitrage Pricing Theory (APT).

> *Required Reading: BKM, Chapters 8 (all), 9 (all), 10 (all), and 13.3.*

5. Empirical Asset Pricing and Portfolio Management Performance Evaluation

We discuss some of the main tests carried out to investigate the empirical merits of the asset pricing models discussed so far. We then go on to approach the problem of market efficiency: we discuss the different levels of efficiency (weak, semi-strong and strong) and analyze the basic empirical evidence that supports, or rejects, this notion. Anomalies to the asset pricing models and revised models are analyzed.

We will also discuss how to evaluate past performance of portfolio management by investment advisors in the context of the asset pricing models. Specific topics include measures of past performance, survivorship bias, benchmarks and style drifts.

> *Required Reading: BKM, Chapters 11 (all).*
> *Optional Reading: BKM, Chapters 12 (all), 24 (all).*

Tentative Course Schedule

(Due dates for student deliverables are in **bold**)

        Day/Sac   Bay Area

Topics: *Overview of Portfolio Management*

Lecture 1a Sep 22	Sep 23	**Due: Assignment #1**
Lecture 1b Sep 29	Sep 24	**Quiz #1**

Topics: *Quantitative Review and Capital Market Assumptions*

Lecture 2a Oct 6	Oct 7	**Due: Assignment #2**

Topics: *Portfolio Mathematics and Optimal Portfolio Choice*

Lecture 3a Oct 13	Oct 8	**Quiz #2**
Lecture 3b Oct 20	Oct 21	**Due: Assignment #3 & Project component part 1**
Lecture 3c Oct 27	Oct 22	**Quiz #3**

Topics: *Equilibrium Asset Pricing Models*

Lecture 4a Nov 3	Nov 4	**Due: Assignment #4 & Project component part 2**
Lecture 4b Nov 10	Nov 5	**Quiz #4**

Topics: *Empirical Asset Pricing and Performance Evaluations*

Lecture 5a Nov 17	Nov 18	**Due: Assignment #5 & Project component part 3**
Lecture 5b Dec 1	Nov 19	**Quiz #5**

Course Project

Due Date Dec 8	Dec 9	**Due: Final Project**