#### AC.F321 INVESTMENTS

#### LENT TERM 2024

#### Course Objectives

The course investigates how to manage the trade-off between maximising expected return and minimising risk for portfolios of securities.

Issues to be considered include allocation of assets, selection of securities, and optimal portfolio strategies. The use of derivatives and fixed-income securities in investment management will also be covered.

While the theoretical underpinnings will not be neglected, the emphasis of the course will be on *implementation* of the theory i.e. investment management *in practice*.

**Learning Outcomes**

By the end of the course you should be able to:

* Discuss the theory and applications of the modern portfolio analysis and understand their strengths and limitations.
* Construct the optimal portfolio for an individual or for funds with specific goals.
* Solve real-world problems with asset pricing models.
* Develop techniques to evaluate the performance of money managers.
* Understand the debate questioning the efficient market hypothesis.
* Comprehend the structure and objectives of mutual funds and major investment companies, and identify when they are appropriate.
* Understand the characteristics of hedge funds, and the variety of hedge fund strategies and styles.

**Reading and e-learning resources**

Recommended textbooks

For an organised comprehensive text from which you can revise, and which covers the material systematically and in depth, you need to use a textbook. The recommended text is:

Bodie Z., Kane A., and Marcus A.J. (2014) *Investments.* 11th ed. McGraw-Hill

You should definitely buy a copy. It is probably not worth buying the latest edition if you have already got an earlier edition – though of course the page and chapter references will no longer be relevant. There is a cut-down version called *Essentials of Investments* that contains the main elements in a less technical form. If for some reason you do not like this book, you could use:

Elton E.J., Gruber M.J., Brown S.J., and Goetzmann W.N. (2003) *Modern* *Portfolio Theory and Investment Analysis.* 7th ed. Wiley

You should also read one or more of the books about the turmoil; Michael Lewis’s *The Big Short* and Sorkin’s *Too Big to Fail: The Inside Story of How Wall Street and Washington Fought to Save the Financial System-And Themselves* are probably amongst the best. I also recommend Lowenstein’s, When Genius Failed: The Rise and Fall of Long Term Capital Management. The book is among the most comprehensive analysis of trading on Wall Street and its impact on real economy.

If you are looking for a good reference book on financial modeling in Excel, you could use:

Benninga S. (2014) *Financial Modeling.* 4th ed.MIT Press.

Chapter 8-12 should be especially useful for this course.

**Course Administration**

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Office Hours**:** Wednesday 10:00 to 12:00

Lectures**:** Recorded lectures will be uploaded to Moodle.

Assignments

I will provide a problem set for each week.

You will find the questions are of three types: true/false; simple examples of things covered in the lecture; more demanding problems that are more similar to those in the final exam. The assignments are intended to reinforce your learning, test your knowledge and generally think more deeply about the issues raised. They should also be of great help in doing well on the assessed part of the course.

Model answers will be provided.

The exception to the general pattern will be the first assignment. This is designed to ensure that you are familiar with some of the key concepts of returns, correlations etc. that will be critical for lecture 2.

I cannot stress too much the importance of working through the assignments. The seductive strategy of allowing knowledge to be gently absorbed through attending lectures and picking up the model answers, and then doing a total immersion study of past papers just before the test just will not work. You need time to absorb the ideas; the problems then become much easier to solve.

Workshops

Workshop groups meet once a week, **beginning in Week 12 (w/c 22/01/2024)**. Attendance at workshops is compulsory. Workshops will be conducted both online (Teams) and in-person.

The workshops will focus on the weekly assignments. You should come prepared to discuss your answers to the questions set each week. In the workshops, I will not seek to go through the entire problem set. Rather, I will seek to focus on those that cause you most problems and those that raise the most interesting issues.

Note: It is your responsibility to ensure you register your attendance in compulsory sessions on this course by checking into the i-Lancaster system during live sessions (both for in person sessions and sessions held via Microsoft Teams). In sessions via Microsoft Teams, the session leader/teacher will provide you with a code to check in. Please ask if you are unsure how to register your attendance in a session.

Material

Lecture notes and problem sets will be posted on Moodle. Model answers will be posted on Fridays after the respective seminars. The lecture notes are in PowerPoint form. To avoid extensive calculations and formulae, I often leave them to additional Excel spreadsheets. You will also ﬁnd them on Moodle. The lecture notes are not intended to be a comprehensive and self-contained summary of all you need to know; rather they are designed to accompany the lectures, provide a skeleton of the argument and points covered, and provide a way of organising your own notes on what is covered in the lecture. If you have to miss the lecture – and I really strongly recommend you not to - then you can use the notes to give you an idea of what I have covered, but you will need to read the textbook, do the exercises and pay full attention at the seminars to remedy the gap.

**Course Assessment**

Assessment is in two parts. There will be a class test in week 19, which will contribute 25% to the final mark for the module. The remaining 75% will be assessed with an examination in the Summer Term. The term test is designed to test whether you have a good conceptual grasp of the course. The exam in the summer will test your ability to apply the material to real problems and solve them.

Further information about both the test and the final examination will be given in due course.

Please note that there is no opportunity for re-assessment for visiting students failing to achieve the necessary pass mark for their home University. Also, note that the Department reserves the right to adjust coursework grades to ensure that the grades have an appropriate distribution.

**Course outline**

[BKM = Bodie, Kane & Marcus]

1. *Financial instruments and markets*

Money markets vs. capital markets. Return vs. risk. Indices. Trading mechanics. Short sales. Eurobonds.

*BKM Ch. 1-5. There is a lot of reading here. It is institutional, and it has very little intellectual content. You should skim read it. The terminology is important because it will keep on cropping up in the rest of the course. I will highlight the main points in the lecture.*

*You should ensure you are familiar with the following concepts from Chapter 5: nominal and real interest rates, continuous and discretely compounded rates, excess return, risk premium, volatility, Sharpe ratio and normal distributions.*

2. *Diversification and Portfolio Theory*

Mean-variance analysis. Diversification. Efficient portfolios. International diversification. Two fund separation. Capital Asset Pricing Model.

*BKM Ch. 6-9 up to 9.3. I will assume that investors are concerned with risk (as measured by standard deviation) and return (as measured by expected return). Ch 6 justifies this approach in terms of utility theory – so worth reading and thinking about if you want a more rigorous explanation.*

*Ch 7 and Ch 9 sections 9.1-9.2 are absolutely critical and you need to understand them fully. Ch 8 is less central; focus on sections 8.2 and 8.3; 8.5 is also quite important; you may want to return to the material on the market model after Week 3.*

3. *Asset Pricing Models*

Using and testing the CAPM. Extensions to CAPM. Market model. Arbitrage Pricing Theory.

*BKM Ch. 9.3 - 10. You need to read all of this material carefully. This is in many ways the intellectual centre of the course.*

*4. Empirical Analysis of Security Returns*

*BKM Chapter 13.* This lecture focuses on the empirical tests of the CAPM and APT discussing the methods of test as well as presenting the findings from the financial data. Various multifactor models are presented to analyse market anomalies*.*

*5. Market Efficiency*

Definitions and degrees of market efficiency. Empirical evidence on market efficiency. Anomalies and alternative explanations.

*BKM Ch.11 - 12.1. These chapters are largely descriptive, but are vital to your understanding of investments management. Sections on Behavioural Biases is interesting but I will focus heavily on the Limits to Arbitrage sections.*

6. *Portfolio performance measurement*

Time-weighted *vs*. value-weighted returns. Jensen, Treynor, Fama and Sharpe measures. Stock selection. Market timing. Statistical significance. Incentives.

*BKM Ch. 24. Of the sections in this chapter 24.1 (The Conventional Theory, Evaluating Performance Evaluation) and 24.6 (Performance Attribution Procedures) are core. 24.2 (Hedge Funds), 24.3 (Changing Composition) and 24.4 (Market Timing) are worth a good read and give you a feel for the subtleties of the performance measurement game.*

7-8 *Fixed-income securities and portfolio management*

Clean *vs*. dirty price. Yield. Term structure of interest rates. Default risk. Convertible bonds. Callable bonds. Duration and convexity. Immunisation. Active bond portfolio management.

*BKM Ch. 14-16. The whole of the three chapters is core apart from the material on convexity of callable bonds and mortgage backed securities, and the section on Active Bond Management.*

9-10. *Hedge Funds*

*BKM Chapter 26.* These lecture reviews the most important features of hedge funds and also introduces major hedge funds strategies.

I also want to ensure that we leave some space in the module to cover some topical issues or issues that are of particular concern to the class.

**Communication**

Please contact me if you have any problems with the course – raise the issue at a workshop, email me, or speak to me during my office hours. I would much prefer to hear your concerns or worries early on when I can clear the problem up rather than hear about them afterwards.

Enjoy the course.

**Vikas Raman**