| ASSET PRICING AND FINANCIAL MARKETS |
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## Course Instructor:

Veronika Vinogradova, Dipl.-oec., MA
E-mail: vvinogradova@hse.ru

## Organization of the course

| Program | Bachelors |
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| Year | 4th year |
| Course status | Elective |
| Teaching methods | Lectures, seminars (group home assignments, in-class participation), mini-cases, mid-term exam, final exam |

### Course objectives

This course is aimed at students who wish to understand how financial markets work and how securities are priced. It provides a sound foundation in bond and security pricing using present value techniques, introduces the key concepts of portfolio theory by Harry Markowitz and leading asset pricing models and teaches how to create the optimal securities portfolio. It also provides valuable insights into the concept of financial market efficiency and explains why so many bubbles and market crashes happen. Finally, it presents the derivative instruments, teaches how to price and how to trade them. The course is designed as a preparation course for the examination at the University of London.

Having completed the course and done the required reading and assessments, a student should be able to:

- Explain how to price assets using both present value and absence of arbitrage methods
- Describe the important differences between stock, bond and derivative securities
- Apply present value techniques to price stock and bonds
- Employ mathematical tools to compute risk and return for portfolios of securities
- Evaluate portfolio choice problems
- Present, explain and apply the Capital Asset Pricing Model for computing expected returns
- Critically evaluate the evidence for informational efficiency of stock markets
- Price derivative securities using absence of arbitrage

The timeline is meant as a guide, but the lecturer reserves the right to modify the topics and class schedule.

# Course content

Topic 1. Introduction to the course and its basic principles

Topic 2. Understanding and pricing government bonds

Topic 3. Valuation of stocks

Topic 4. Risk, returns and stock portfolios

Topic 5. Portfolio theory and the CAPM

Topic 6. Market efficiency

Topic 7. Derivative securities and derivative pricing


# Plan of classes

| Topic 1. Introduction to the course and its basic principles | |
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| Date:<br>Time:<br>Room: | The topic is an introductory one, aiming to build a general understanding of major concepts of the course and recall basic mathematical techniques.<br><br>Main issues covered:<br>- Time value of money<br>- Present value calculations (discounting, compounding, Net Present Value rule)<br>- Different types of interest rates<br>- Annuities and perpetuities<br>- Fisher separation theorem<br>- No arbitrage rule |
| Topic 2. Understanding and pricing government bonds | |
| Date:<br>Time:<br>Room: | The topic is concerned with the major approaches to price bonds. We will start our analysis of bond market by looking at the valuation of government bonds and the interest rates the government pays when it borrows. We will also learn how the interest rates are determined and what happens when they change. Moreover, we will learn to understand what bond dealers mean when they quote spot rates or yields to maturity.<br><br>Main issues covered:<br>- Valuation of coupon and zero coupon<br>- Valuing bonds using the present value methods (i.e. discounted cash flow method)<br>- The term structure of interest rate and bond valuation<br>- Yield to maturity and the yield curve<br>- Interest rate risk and Macaulay duration<br>- Spot and forward interest rates<br>- Modeling the term structure of interest rate |

| Topic 3. Valuation of stocks | |
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| Date:<br>Time:<br>Room: | The topic makes you familiar with stock markets, explain how they work and teaches you to use the concept of present value to price common stocks. In order to understand what determines the shareholder value, we will also at how stocks are traded. Then, we will explain the basic principles of share valuation and the use of discounted-cash-flow models to estimate the expected returns We will also look at the fundamental difference between growth and value stocks.<br><br>Main issues covered:<br>  - Stock markets<br>  - Different types of stocks (preferred vs. common)<br>  - Dividend discount models<br>  - The Gordon Growth Model<br>  - Link between earnings per share, payout ratios and stock prices<br>  - The present value of growth options<br>  - Company valuation using the present value methods |
| Topic 4. Risk, return and stock portfolios | |
| Date:<br>Time:<br>Room: | The topic addresses the concept of risk and return. We will learn how the risk is defined and how it influences the rates of return in capital markets. Then, we will take a closer look at investment risks and how they can be reduced by portfolio diversification. We will discuss the beta, the standard risk measure for individual securities. Finally, we will look at the possible limits to diversification.<br><br>Main issues covered:<br>  - Mathematical tools to compute risk and returns for portfolio of securities (mean, varience, standard deviation, variability, covariance)<br>  - impact of single securities on portfolio risk (beta, systematic vs, unsystematic risk)<br>  - efficient frontier, capital market line<br>  - limits to diversification |
| Topic 5. Portfolio theory and the CAPM | |
| Date:<br>Time:<br>Room: | The topic presents the leading theories linking risk and returns in a competitive economy and explains how this theories can be used to estimate the returns required by investors in different stock-market investments. We will start with the most widely used theory, the capital asset pricing theory and look additionally at another class of models, known as arbitrage pricing and factor models.<br><br>Main issues covered:<br>  - Combining stocks into portfolios<br>  - Estimation of expected returns<br>  - Security market line<br>  - Deviations from security market line<br>  - Major assumptions behind the Capital Asset Pricing Model (CAPM)<br>  - Tests and validity of CAPM<br>  - Alternative theories (Arbitrage Pricing Theory, the Three/Five-Factor model) |

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| **Topic 6. Market efficiency** | |
| Date:<br>Time:<br>Room: | The topic focuses on the major issues of capital market efficiency. We will define the efficient market hypothesis and learn that it comes in different strengths, depending on the information available to investors. We will also review the evidence for and against efficient markets and try to explain why the market bubbles happen. We will close this topic with six lessons of market efficiency.<br><br>Main issues covered:<br>   - The value of information for investor<br>   - Why should markets be efficient?<br>   - Three forms of market efficiency<br>   - Problems with testing market efficiency<br>   - Evidence for and against market efficiency<br>   - Puzzles and anomalies<br>   - The six lessons of market efficiency |
| **Topic 7. Derivative securities and derivative pricing** | |
| Date:<br>Time:<br>Room: | The topic introduces you to the world of derivative securities and teaches you to price them. We will first get familiar with different types of derivatives and learn how options, forward and future contracts work. We will learn what the call and put options are and how their pay off depends on the price of underlying asset. We then introduce the binominal model and the Black-Sholes formula for valuing options. We will also discuss how you can combine options to produce a variety of interesting strategies<br><br>Main issues covered:<br>   - The definition of derivative contract<br>   - absence of arbitrage and pricing of derivatives<br>   - forwards and futures contracts<br>   - forwards on stocks, currencies and commodities<br>   - option contracts<br>   - risk and option values<br>   - option pricing using binomial models and Black-Scholes<br>   - practical use of option contracts<br>   - |

## Course Requirements and Evaluation system

1. Attendance/Punctuality
Students are expected to attend all classes and be on time. The maximum number of absences is three (3). Although attendance itself is not given a grade equivalent, it will have impact on the student's participation in class activities. Students who miss class sessions are responsible for the lessons taken up and are not excused from the work or assignments for that session.

2. Class participation
Each student is expected to actively participate in discussions through sharing one's ideas and experiences relevant to the topic under discussion, giving comments and asking questions whenever appropriate. In order to participate actively in class discussions and mini-cases exercises, students

are expected to prepare and do the assignments prior to each session. The students should be ready with a soft copy of their reports for presentation to the class when called by the instructor.

3. Individual assignment
The students are expected to do all assigned activities for each session and submit on time written reports specified to a course syllabus. Late reports will not be accepted and will not be given any grade credit. The students should be ready with a soft copy of their reports for presentation to the class when called by the instructor.

4. Mini-cases
Leaners will be formed into small groups of 4-5 members and will be asked to apply knowledge learned, using specific cases assigned by the instructor. Each student is expected to actively participate in the group discussions and cooperate with the other team members in carrying out and fulfilling the requirements for the group assignment. The instructor will give a grade for each group output/presentation and will require peer rating and evaluation in giving the individual grades for the group assignments.

The following criteria will be used to grade the assignments
-   The answers should be brief and to the point.
-   Students should show that they have assimilated the material covered in class, and in the case of the assignment that they have also read the additional material.
-   Students should attempt to provide the justification of their statements. For instance, if a statement is true or false, it should also be explained why.

Grading policy
The final grade consists of the following elements:

| Element | Weight | | |
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| 1. Quizes | 10% | | |
| 2. Seminars (= home team assignments + class participation) | 15% | 40% | |
| 3. Mini-cases | 15% | | 100 % |
| 4. Mid-term exam | 20% | 60% | |
| 5. Final exam | 40% | | |

*__Final grade__ = 0,1 Quizes + 0,15 Seminars + 0,15 MiniCases + 0,20 MidTermExam + 0,4 FinalExam*

**Required reading:**
1.   Brealey, Richard A., Stewart C. Myers, and Franklin Allen. 2017. Principles of corporate finance. New York, NY: McGraw-Hill/Irwin. + its Web-application

**Additional Reading**
1.   Berk, Jonathan and Peter DeMarzo. 2017. Corporate finance. Boston, Mass.: Pearson.
2.   Hillier, David, Mark Grinblatt and Sheridan Titman. 2012. Financial Markets and Corporate Strategy, 2nd European edition, New York, NY: McGraw-Hill/Irwin