**《投资学》教学大纲**

**Investments Syllabus**

课程编号：151293A

**Course Code**: 151293A

课程类型：专业必修课

**Course Type**: Major compulsory course

总学时:**Period**: 48

学分：**Credits**: 3

适用对象：金融学（数据与计量分析）

**Applicable Majors**: Finance

先修课程：微观经济学，概率论与数理统计

**Preparatory Courses**: Microeconomics, Probability and Mathematical Statistics.

1. **课程的教学目标**

本课程是对不确定性下的个人微观行为及均衡资产价格的分析。本课程旨在帮助学生理解经济中个体在不确定性下如何做决策，如何通过金融工具规避风险，以及在均衡中金融资产如何定价，并且通过课程思政教育培养学生对金钱的理性态度，遵纪守法的品质以及维护金融市场公平有效的信念。学完本课程后，学生应该对金融中的基本概念很好的掌握，可以解决有约束的最优化问题，以及推导均衡的资产价格，为成为具有职业操守和投资道德的未来投资人打下基础。本课程为以后的衍生资产定价和更高级的金融课程提供基础。

This course carries on the microeconomic analysis to uncertainty. It aims to help students to understand how individuals make choice under uncertainty, how individuals could hedge risks through financial instruments, and how financial assets are priced in equilibrium. Upon completion of this course, students should have solid understanding of basic concepts in finance, solve constrained optimization problem under uncertainty, and derive the equilibrium asset price. This course gives students preparation for derivative pricing and more advanced finance courses.

1. **教学的基本要求**

投资学通过严格的数学分析工具来分析不确定性下个体是如何做决策，风险厌恶，风险度量，最优资产组合的选择，和金融产品的定价。课程的授课重点是风险厌恶、风险补偿和风险这些基本概念，解决有约束的最优化方法，最优解的比较静态分析，均值-方差分析，以及推导CAMP和APT资产定价模型。课程的难点在与广泛使用微积分和抽象推导。为了克服这一难点，授课中很多具体的例子会被用来解释概念的含义，以及模型解决技巧的使用。作业也是课程的重要组成部分。每章结束后都会有一次作业，作业分组完成，鼓励组内学生的探讨与交流。作业的设计主要考虑到与教课内容的互补，包括具体实例的计算和一些证明。课程考核由三部分组成，分别是平时作业16%，期中闭卷考试24%，期末闭卷考试60%。

This course provides analytical tools to model individual decision making under uncertainty, risk aversion, measurement of risk, optimal portfolio choice and asset pricing. The emphases will be on concepts of risk aversion, risk compensation, and risk, and on the techniques to solve optimal portfolio, to do comparative statics, to derive Capital Asset Pricing Model and Arbitrage Pricing Theory. One potential challenge of this course is the extensive use of calculus and abstract reasoning. However, many concrete examples will be provided to illustrate the intuition of basic concepts and how to apply techniques to solve a model. Homework represents an important part of this course. Each chapter will be followed by one homework, which will be done by groups. Homework is designed to complement lecture notes, including calculation of concrete examples and proof of some statements in lecture notes. The grades include three parts, homework, midterm exam, final exam. Homework counts for 16% of the final grade, midterm exam counts for 24% of the final grade, and final exam counts for 60% of the final grade.

**三、各教学环节学时分配**

**教学课时分配**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **序号** | **章节内容** | **讲课** | **实验** | **其他** | **合计** |
| **1** | **期望效用理论**  **Expected Utility Theory** | **3** |  | **Homework 1** |  |
| **2** | **风险厌恶**  **Risk Aversion** | **6** |  | **Homework 2** |  |
| **3** | **风险**  **Risk** | **6** |  | **Homework 3** |  |
| **4** | **预算约束**  **Budget Constraint** | **3** |  | **Homework 4** |  |
| **5** | **一个风险资产的最优资产组合**  **Optimal Portfolio with one risky asset** | **6** |  | **Homework 5** |  |
| **6** | **多个风险资产的最优资产组合**  **Optimal Portfolio with many risky assets** | **6** |  | **Homework 6** |  |
| **7** | **均值-方差投资分析**  **Mean-Variance Portfolio Analysis** | **6** |  | **Homework 7** |  |
| **8** | **资本资产定价模型**  **Capital Asset Pricing Model** | **6** |  | **Homework 8** |  |
| **9** | **套利定价模型**  **Arbitrage Pricing Theory** | **6** |  | **Homework 9** |  |
| **合计** |  | **48** |  |  |  |

**四、教学内容**

**第一章期望效用理论**

**CHAPTER I: Expected utility theory**

1. 消费者效用理论

PART 1 Basic Preference Theory

第二节期望效用理论

PART 2 Expected Utility Theory

**教学重点、难点：**偏好的效用函数表示，和期望效用的计算。

**Key Points:** utility function representation of preferences, and calculation of expected utility for a lottery.

**课程的考核要求：**理解什么条件下偏好存在效用函数表示，掌握期望效用的计算。

**Requirement:** understand when a preference can be represented by a utility function, master the calculation of expected utility for a lottery.

**第二章：风险厌恶**

**CHAPTER 2: Risk aversion**

第一节风险厌恶定义

PART 1 Definition of risk aversion

第二节风险厌恶与效用函数凹性

PART 2 Risk aversion and concavity of utility function

第三节风险厌恶与风险补偿

PART 3 Risk aversion and risk compensation

第四节风险厌恶的比较

PART 4 Comparative risk aversion

第五节经典效用函数

PART 5 Classical utility functions

**教学重点、难点：**不同风险度量的含义及其之间的等价，风险厌恶指数的计算。

**Key Points:** different measures of risk aversion and their equivalence, computation of the corresponding risk aversion given a utility function.

**课程的考核要求：**理解不同风险度量的含义及其之间的等价，掌握风险厌恶的定义和风险厌恶指数的计算。

**Requirement:** understand different measures risk aversion and their equivalence, master the definition of risk aversion and the calculation of risk aversion index.

**第三章风险**

**CHAPTER 3 Risk**

第一节风险定义

PART 1 Definition of Risk

第二节风险与风险厌恶

PART 2 Risk and risk aversion

第三节风险与方差

PART 3 Risk and variance

**教学重点、难点：**风险的定义，风险与风险厌恶的关系，风险与方差的区别，本节课中应插入课程思政内容，提高学生对于风险的认知，以及对人为增加市场风险的行为的辨别。

**Key Points:** the definition of risk, its relation with risk aversion, and its difference from variance.

**课程的考核要求：**理解风险与风险厌恶的关系，掌握风险的定义及其与方差的区别。

**Requirement:** understand the relation between risk and with risk aversion, master the definition of risk, and its difference from variance.

**第四章预算约束**

**CHAPTER 4 Budget constraint**

第一节资产

PART 1 Assets

第二节无套利价格

PART 2 Non arbitrage prices

第三节投资组合限制

PART 3 Portfolio restrictions

**教学重点、难点：**资产的数学表示，无套利含义。本节课中应插入课程思政内容，提高学生对于投资组合构建中的道德问题的认识。

**Key Points:** the representation of an asset, the definition of non arbitrage.

**课程的考核要求：**理解资产的表示，掌握无套利的定义。

**Requirement:** understand the representation of an asset, master the definition of non arbitrage.

**第五章一个风险资产的最优投资组合**

**CHAPTER 5 Optimal portfolio with one risky asset**

第一节投资组合问题

PART 1 Portfolio choice problem

第二节最优投资组合

PART 2 Optimal portfolio

第三节风险溢价最优投资组合

PART 3 Risk premium and optimal portfolio

第四节最优投资组合比较静态分析

PART 4 Comparative statics of optimal portfolio

**教学重点、难点：**求解只有一个风险资产时的最优投资组合，以及最优投资组合的比较静态分析。

**Key Points:** solve the optimal portfolio, and its comparative statics.

**课程的考核要求：**熟练掌握求解只有一个风险资产时的最优投资组合，以及最优投资组合的比较静态分析。

**Requirement:** master how to solve the optimal portfolio, and its comparative statics.

**第六章多个风险资产的最优投资组合**

**CHAPTER 6 Optimal portfolio with many risky assets**

第一节最优投资组合

PART 1 Optimal portfolio

第二节风险与收益的权衡

PART 2 Risk-return trade-off

第三节公平定价下的最优投资组合

PART 3 Optimal portfolio under fair pricing

第四节风险溢价与最优投资组合

PART 4 Risk premium and optimal portfolio

第五节线性风险承受下的最优投资组合

PART 5 Optimal portfolio under linear risk tolerance

**教学重点、难点：**风险与收益的权衡，线性风险承受下的最优投资组合。本节课应插入课程思政内容，提高学生对于收益与风险之间关系的认识，提高警惕性预防诈骗，并且了解合理控制风险对于金融市场稳定性的重要作用。

**Key Points:** the trade-off between risk and return, and calculation of the optimal portfolio under linear risk tolerance.

**课程的考核要求：**理解风险与收益的权衡，掌握线性风险承受下的最优投资组合。

**Requirement:** understand the trade-off between risk and return, and master the calculation of the optimal portfolio under linear risk tolerance.

**第七章期望-方差投资分析**

**CHAPTER 7 Mean-variance portfolio analyses**

第一节期望-方差分析与期望效用

PART 1: Consistency of mean-variance analysis with expected utility

第二节标准均值-方差投资问题

PART 2: Standard mean-variance portfolio problem

**教学重点、难点：**期望-方差分析与期望效用分析的关系，均值-方差最优投资组合。

**Key Points:** relation between mean-variance analysis and expected utility analysis, calculation of the optimal mean-variance portfolio.

**课程的考核要求:**理解期望-方差分析与期望效用分析的关系，掌握均值-方差最优投资组合的推导。

**Requirement:** understand the relation between mean-variance analysis and expected utility analysis, master the derivation of the optimal mean-variance portfolio.

**第八章资本资产定价模型**

**CHAPTER 8 Consumption Asset Pricing Model**

第一节证券市场线

PART 1: Security market line

第二节均值-方差偏好下的均衡投资组合

PART 2: Equilibrium portfolio under mean-variance preference

第三节二次项函数

PART 3: Quadratic utility

第四节正态分布的收益

PART 4: Normally distributed payoffs

**教学重点、难点：**资产风险溢价及此资产收益与其市场收益协方差之间的关系。

**Key Points:** the relation between the risk premium on any asset and the covariance between the return to that asset and the market return.

**课程的考核要求:**掌握资产风险溢价及此资产收益与其市场收益协方差之间的关系。

**Requirement:** master the relation between the risk premium on any asset and the covariance between the return to that asset and the market return.

**第九章套利定价理论**

**CHAPTER 9 Arbitrage Pricing Theory**

第一节无误差因子定价

PART 1: Exact factor pricing

第二节无误差定价，beta定价和CAPM

PART 2: Exact factor pricing, beta pricing and the CAPM

第三节因子定价误差

PART 3: Factor pricing errors

第四节因子结构

PART 4: Factor structure

**教学重点、难点：**资产风险溢价及此资产收益对因子风险敏感度之间的关系。

**Key Points:** the relation between the expected return on any asset and the measure of the sensitivity of an asset’s return to factor risk.

**课程的考核要求:**掌握资产风险溢价及此资产收益对因子风险敏感度之间的关系。

**Requirement:** master the relation between the expected return on any asset and the measure of the sensitivity of an asset’s return to factor risk.

**五、主要参考书Textbooks**

1. Bodie, Kane and Marcus. Investments.McGraw Hill. 10e. 2014

2. Leroy and Werner. Principles of financial economics.Cambridge University Press. 2001