



Syllabus

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|---|-----------------------|-----------------------|--------------------------------|----------------|--------------------------------|
| Course No. | 1900713W | College | Economics and Management | Dept. | Management Science Engineering |
| Teacher | Jianli Wang | | | | |
| Time | 2022.06.28-2022.07.15 | | | | |
| Course Name | English | Financial Mathematics | | | |
| | Chinese | 金融数学 | | | |
| Course credits hours | Total | Theory | Office Hour or Practice | Credits | |
| | 70 | 60 | 10 | 12.0 | |
| Course description: Describe the aims of the course | | | | | |
| <p>1. Course nature and academic status</p> <p>This course is basic for the students of actuary major. It follows the syllabus for Financial Mathematics (FM) Exam of the Society of Actuaries and prepares students to pass the FM exam.</p> <p>2. Course aims (theory, ability and technique)</p> <p>Through the study of this course, students are familiar with the method of interest rate measurement, accumulation functions, yield rates, annuities, term structure of interest rates/spot rates/forward rates, duration/convexity.</p> | | | | | |
| Requirements for courses; ability and knowledge in advance | | | | | |
| Basic knowledge in vector algebra, multivariate calculus, probability and statistics. | | | | | |
| Course structure explanation: | | | | | |
| Make clear the necessary parts, optional parts, distribution of hours. Courses with experiments or practice are expected to explain credit hours needed, content, scheme and functions. | | | | | |

Chapter 1 The growth of money

points and aims: accumulation and amount functions; simple interest; compound interest; interest in advance; discount functions; simple discount; inflation distribution of hours: 8 hours

Chapter 2 Equation of value and yield rates

points and aims: equations of value for investments involving a single deposit made under compound interest; equations of value for investments with multiple contributions; investment return; reinvestment considerations; approximate dollar-weighted yield rates distribution of hours: 8 hours

Chapter 3 Annuities

points and aims: annuities immediate; annuities due; perpetuities; deferred annuities and values on any

date; outstanding loan balances; nonlevel annuities

distribution of hours: 6 hours

Chapter 4 Loan repayment

points and aims: amortized loans and amortization schedules; the sinking fund method; loans with other repayment patterns; yield rate examples and replacement of capital distribution of hours: 6 hours

Chapter 5 Bonds

points and aims: bond alphabet soup and the price formula; the premium-discount formula; other

pricing formula for bonds; bond amortization schedules; valuing a bond after its date of issue; yield

rate examples; floating-rate bonds

distribution of hours: 6 hours

Chapter 6 Stocks and financial markets

points and aims: common and preferred stock; brokerage accounts; going long: buying stock with

borrowed money; Selling short: selling borrowed stocks

distribution of hours: 6 hours

Teaching methods (Lectures, practice, etc)

Chalkboard lectures cover the theoretical material that forms the basic of the course.

We will have recitations for practice and the applications.

Forms of evaluation and requirements

Structure of the final grade(including presence, class performance,), focus of exam, forms of exam(test, interview, final report, etc)

The final score is composed by two parts: the final examination is 80%, homework and reports is 20%

| | Name | Publisher | Author | Year | Price |
|-----------------------|--|------------------|-------------------------------|-------------|--------------|
| Textbook | Mathematical Interest Theory, 2 nd Edition(PDF) | Pearson | J. Daniel, L. Vaaler | | |
| References | | | | | |
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| Website | | | | | |
| Course members | | | | | |
| College | | | | | |