课程详述

COURSE SPECIFICATION

　　以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

　　The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	量化金融 Quantitative Finance
2.	授课院系 Originating Department	数学系 Department of Mathematics
3.	课程编号 Course Code	MA220-14
4.	课程学分 Credit Value	2
5.	课程类别 Course Type	专业选修课 Major Elective Courses
6.	授课学期 Semester	夏季 Summer
7.	授课语言 Teaching Language	中英双语 English & Chinese
8.	授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）	冯黎明, Department of Industrial and Enterprise Systems Engineering, feng.liming@outlook.com
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA
10.	选课人数限额(可不填) Maximum Enrolment（Optional）	

11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
	学时数 Credit Hours	32				32

12.	先修课程、其它学习要求 **Pre-requisites or Other Academic Requirements**	概率论 或者 概率论与数理统计 Probability and Statistics or Probability Theory
13.	后续课程、其它学习规划 **Courses for which this course is a pre-requisite**	
14.	其它要求修读本课程的学系 **Cross-listing Dept.**	

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本课程介绍量化金融中的一些基本问题，原理和方法。

This course introduces some of the basic problems, principles and methods that arise in quantitative finance.

16. 预达学习成果 Learning Outcomes

通过教学使学生掌握如何使用数学，统计和计算方法解决金融中的量化问题。

After taking the course，students should be able to solve some of the basic quantitative finance problems using mathematical, statistical and computational methods.

17. 课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

1、利率和债券：复利，贴现，债券，收益率，久期，凸性，无风险利率（4 学时）

Interest rates and bonds: compounding, discounting, bonds, yield, duration, convexity, risk free rates

2、投资组合和资本资产定价模型：分散风险，均值标准偏差图，有效前沿，优化，资本市场线，贝塔系数（8 学时）

Portfolio selection and CAPM: diversification, mean standard deviation diagram, efficient frontier, optimization, capital market line, beta,

3、远期和期货：远期，远期价格，无套利原理，远期合同价值，期货，期货价格，多头/空头套期保值，交叉保值（8 学时）

Forwards and futures: forward contract, forward price, no arbitrage principle, valuation of forward contracts, futures, futures price, long/short hedge, cross hedging

4、期权及其定价：看涨/看跌期权，欧式买卖权平价关系，美式期权，期权组合，二叉树模型，布莱克-舒尔-默顿模型，波动率微笑（8 学时）

Options and option pricing: calls and puts, European put-call parity, American options, option spreads and combinations, binomial model, Black-Scholes-Merton model, volatility smile

5、数值方法及其他前沿量化金融话题（4 学时）

Computational methods and other contemporary topics in quantitative finance

18. 教材及其它参考资料 Textbook and Supplementary Readings

参考教材 Textbook：

Options, Futures, and Other Derivatives (10th Edition), John.C.Hull, 2017, ISBN-10: 9780134472089, ISBN-13: 978-0134472089.

Investment Science, David G. Luenberger, 1997, ISBN-10: 0195108094, ISBN-13: 978-0195108095.

Statistics and Data Analysis for Financial Engineering, David Ruppert and David S. Matteson, 2015, ISBN-10: 1493926136, ISBN-13: 978-1493926138

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10		
课堂表现 Class Performance		0		
小测验 Quiz		0		
课程项目 Projects		0		
平时作业 Assignments		20		
期中考试 Mid-Term Test				
期末考试 Final Exam		70		
期末报告				

Final Presentation				
其它（可根据需要改写以上评估方式） **Others (The above may be modified as necessary)**		0		

20.   记分方式 **GRADING SYSTEM**

☑ A. 十三级等级制 **Letter Grading**
☐ B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21.   本课程设置已经过以下责任人/委员会审议通过
This Course has been approved by the following person or committee of authority