

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	策略行为 Strategic Behavior				
2.	授课院系 Originating Department	金融系 Department of Finance				
3.	课程编号 Course Code	FIN313				
4.	课程学分 Credit Value	3				
5.	课程类别 Course Type	专业选修课 Major Elective Courses				
6.	授课学期 Semester	春季 Spring				
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)	 Southern University of Science and Technology 董璐，商学院，应用经济系（筹），dongl6@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced				
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	36	12	0	0	48

Credit Hours

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12. **先修课程、其它学习要求
Pre-requisites or Other
Academic Requirements**
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**

该选修课的主要教学目标包括拓展学生的学科视野，策略型思维，培养跨学科思维，并深化他们对行为经济学原理的理解。通过融合经济学、心理学、社会学、博弈论等领域的知识，学生将能更全面地分析经济现象，从而提高综合素质。此外，该课程旨在培养学生解决实际经济问题的能力。强调分析非理性因素对决策的影响，学生将学会更好地应对实际挑战，为未来从事政策制定、金融分析或企业管理提供坚实的理论基础。这些目标将为学生的学术和职业发展提供坚实的基础。

The main objectives of this course include expanding students' disciplinary perspectives, fostering strategic thinking, cultivating interdisciplinary mindset, and deepening their understanding of the principles of behavioral economics. By integrating knowledge from economics, psychology, sociology, game theory, and related fields, students will be better equipped to comprehensively analyze economic phenomena, thereby enhancing their overall competence. Additionally, the course aims to develop students' ability to address real-world economic challenges. Emphasizing the analysis of irrational factors on decision-making, students will learn to better cope with practical issues, laying a solid theoretical foundation for their future involvement in policy-making, financial analysis, or business management. These objectives will provide a solid foundation for students' academic and career development.

16. **预达学习成果 Learning Outcomes**

首先，这门课将拓展学科视野，深化对经济学、心理学、社会学以及博弈论等领域的跨学科理解。这种跨学科的综合知识将使具备全面分析经济现象的能力，有助于形成更系统的问题解决方式。此过程中，学生将培养策略型思维，博弈论等元素将激发他们在决策制定中考虑多方利益与不确定性的能力。其次，学生将培养策略型思维，学会分析非理性因素对决策的影响。这一能力将使更好地应对现实世界中的经济挑战，无论是在政策制定、金融分析还是企业管理领域，都能够提供有力的理论支持。此外，该课程将深化学生对行为经济学原理的理解，使其能够深刻理解心理学和社会学因素如何与经济理论相互作用。

First, it will expand their disciplinary horizons and deepen their interdisciplinary understanding of economics, psychology, sociology, and game theory. This interdisciplinary knowledge equips them with the ability to comprehensively analyze economic phenomena, contributing to the development of a more systematic approach to problem-solving. Additionally, students will cultivate strategic thinking, with elements of game theory serving to stimulate their capacity to consider diverse interests and uncertainties in decision-making. Second, students will foster strategic thinking and learn to analyze the impact of irrational factors on decision-making. This capability will better prepare them to address real-world economic challenges, offering robust theoretical support in fields such as policy-making, financial analysis, or business management. Furthermore, the course will deepen students' understanding of the principles of behavioral economics, allowing them to gain profound insights into how psychology and sociology intersect with economic theory.

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.)

第一周 博弈论导论(3 学时)

- 1.1 博弈论概念(1 学时)本部分主要讲解博弈论的定义和背景, 博弈论的应用领域, 并区分非合作博弈和合作博弈的概念。
- 1.2 个体决策与博弈决策(1 学时) 本部分主要讲解个体决策问题, 以及其他人的加入如何使决策复杂化。
- 1.3 几个经典博弈(1 学时) 本部分主要介绍几个经典的博弈, 包括博彩博弈、选美猜谜博弈和囚徒困境。

第二周 博弈的标准式表述(3 学时)

- 2.1 博弈基本概念(2 学时) 本部分主要讲解博弈的基本要素和背景假设, 在讨论了博弈论的一些基本概念后, 本部分将给出博弈的两种不同表述方式:标准式表述和扩展式表述。
- 2.2 战略集和支付(1 学时)
本部分主要讲解战略、战略集合、支付和支付组合的概念。

第三周 占优战略(3 学时)

- 3.1 占优的逻辑(2 学时) 本部分主要讲解占优战略和劣战略的概念, 以及如何应用重复剔除严格劣战略的得到占优战略均衡。
- 3.2 占优战略示例(1 学时) 本部分主要讲解顺序对占优策略均衡的结果是否有影响, 以及几个使用重复剔除严格劣战略得到占优均衡的示例, 包括囚徒困境、二价拍卖、选美博弈和旅行者困境。

第四章 均衡(3 学时)

- 4.1 无占优的零和博弈(1 学时) 本部分主要讲解零和博弈的基本概念, 并讲解无占优的零和对策。通过示例说明无占优的零和对策的求解方法, 例如“蛋糕切割”问题。
- 4.2 Maximin/Minimax 方法(1 学时)
本部分主要介绍 Maximin/Minimax 方法, 通过示例演示如何使用 Maximin/Minimax 方法求解游戏, 例如“剪刀、石头、布”游戏。讲解 Maximin 和 Minimax 的回报是否一致, 以及广义和对策与极小极大方法的失效。
- 4.3 纳什均衡(1 学时) 本部分主要讲解纳什的贡献和最佳响应的概念, 以及纳什均衡的定义和相互最佳反应的含义。探讨纳什均衡是否总是存在, 以及纳什均衡与优势可解决的结果的区别。通过示例演示纳什均衡在囚犯的困境中的应用。

第五周 混合战略(3 学时)

- 5.1 混合战略纳什均衡(1 学时) 本部分主要讲解完美预见问题的概念, 即参与者在没有任何不确定性的情况下做出决策的情况。并解释最佳响应的概念, 以及何时涉及风险。介绍预期收益的概念, 以及混合战略纳什均衡的概念。
- 5.2 混合战略纳什均衡的求解(2 学时)

本部分主要讲解混合战略纳什均衡的求解方法, 介绍“猎鹿”博弈, 探讨纯策略和混合策略的纳什博弈的区别。讲解均衡的概念, 以及如何混合多种纯策略。探讨最佳响应、主导策略和合理性的概念, 以及在游戏中的行为。提供相关练习题目, 让学生自己动手求解博弈模型, 加深对混合策略纳什均衡等概念和方法的理解。

第六周 非矩阵博弈均衡(3 学时)

- 6.1 非矩阵博弈及其求解(2 学时) 本部分主要讲解非矩阵博弈的概念, 讲解如何要求一个无限可分割的蛋糕, 以及在非矩阵对策中如何解决这类问题, 介绍 Bertrand 定价博弈, 以及具有大策略集的 Bertrand 对策的特点。探讨具有连续策略集的 Bertrand 对策的求解方法, 以及在旅行者的困境中扩展策略集的思路。介绍用微积分求最佳响应函数的方法, 并举例说明。
- 6.2 古诺双寡头模型(1 学时)
本部分主要讲解古诺双寡头模型的特点, 以及在具有离散策略的 n 人博弈中的应用。介绍志愿者的困境的概念, 以及在具有连续策略的 n 人游戏中的求解方法。讲解 n 玩家 Cournot 寡头垄断的概念和求解方法。探讨游戏中的行为:旅行者是否认为丢失的包是一种困境?并解释原因。

第七周 均衡选择(3 学时)

- 7.1 均衡选择的概念和原理(2 学时) 本部分主要讲解均衡选择的定义和性质, 回报函数和焦点的概念和计算方法。
- 7.2 前向归纳法(1 学时) 本部分主要讲解前向归纳法的概念步骤以及相关均衡的概念。

第八周 子博弈(3 学时)

- 8.1 子博弈的概念和原理(1 学时) 本部分主要讲解子博弈的定义和分类, 子博弈的解的概念和分类, 子博弈的提炼纳什均衡与完美子博弈提炼均衡。
- 8.2 子博弈的求解和应用(2 学时) 本部分主要讲解子博弈的求解方法、逆向递推法和策略以及子博弈在商业、社交等领域的应用。

第九周 期中复习(3 学时)

第十一周-第十六周 博弈与行为经典论文讨论 (24 学时)

根据学生的个人兴趣, 引导他们选择涉及经典学术论文的主题, 并鼓励他们自主阅读、深入研究, 并将所选论文的内容进行汇报。接着, 通过在课堂上开展充分的讨论, 致力于加深对论文主题的理解和探索, 并特别聚焦于深化对博弈论的理解。此外, 着眼于追踪学术领域的最新研究进展, 以便及时了解并探讨当前博弈论研究的前沿内容。

Week 1: Introduction to Game Theory (3 hours)

1.1 Concepts of Game Theory (1 hour)

This section primarily discusses the definition and background of game theory, its fields of application, and differentiates between non-cooperative games and cooperative games.

1.2 Individual Decision-making vs. Game Decision-making (1 hour)

This section elucidates individual decision-making issues and how the involvement of others complicates the decision-making process.

1.3 Several Classic Games (1 hour)

This section introduces some classic games, including gambling games, beauty contest guessing games, and the prisoner's dilemma.

Week 2: Standard Formulation of Games (3 hours)

2.1 Basic Concepts of Games (2 hours)

This section mainly explains the basic elements and background assumptions of games. After discussing some basic concepts of game theory, it presents two different ways to describe games: standard formulation and extended formulation.

2.2 Strategy Sets and Payoffs (1 hour)

This section discusses the concepts of strategy, strategy sets, payoffs, and combinations of payoffs.

Week 3: Dominant Strategy (3 hours)

3.1 Logic of Dominance (2 hours)

This part explains the concepts of dominant and inferior strategies, as well as how to apply iterative elimination of strictly dominated strategies to find equilibrium in dominant strategies.

3.2 Examples of Dominant Strategies (1 hour)

This section discusses whether the order affects the results of the dominant strategy equilibrium and provides several examples using iterative elimination of strictly dominated strategies to find the dominant equilibrium, including the prisoner's dilemma, second-price auction, beauty contest game, and traveler's dilemma.

Week 4: Equilibrium (3 hours)

4.1 Zero-sum Games without Dominance (1 hour)

This section delves into the basic concepts of zero-sum games and discusses non-dominant zero-sum games. It uses examples like the "cake-cutting" problem to illustrate the solution methods for non-dominant zero-sum games.

4.2 Maximin/Minimax Methods (1 hour)

This section introduces the Maximin/Minimax methods, showcasing how to solve games using these methods, like the "Rock, Paper, Scissors" game. It explores whether the returns from Maximin and Minimax are consistent and discusses the shortcomings of the general equilibrium and the Minimax method.

4.3 Nash Equilibrium (1 hour)

This section discusses Nash's contributions, the concept of best responses, and the definition and mutual implications of the Nash equilibrium. It examines whether a Nash equilibrium always exists and differentiates it from solvable results using dominance. Examples such as the prisoner's dilemma are used to illustrate the application of Nash equilibrium.

Week 5: Mixed Strategies (3 hours)

5.1 Mixed Strategy Nash Equilibrium (1 hour)

This section introduces the concept of perfect foresight, where participants make decisions without any uncertainty, and explains the concept of the best response and when to involve risks. It introduces the concept of expected payoff and the notion of a mixed strategy Nash equilibrium.

5.2 Solving for Mixed Strategy Nash Equilibrium (2 hours)

This section describes the solution methods for mixed strategy Nash equilibrium, introduces the "stag hunt" game, and discusses the differences between pure strategy and mixed strategy Nash games. It delves into the concept of equilibrium and how to mix various pure strategies. Concepts of best response, dominant strategy, and rationality in games are discussed. Students are provided with exercise problems to solve game models and deepen their understanding of mixed strategy Nash equilibrium.

Week 6: Non-matrix Game Equilibrium (3 hours)

6.1 Non-matrix Games and Their Solutions (2 hours)

This section discusses the concept of non-matrix games, how to request an infinitely divisible cake, and how to solve such problems in non-matrix games. It introduces the Bertrand pricing game and the features of Bertrand games with large strategy sets. The solution methods for Bertrand games with continuous strategy sets and the idea of expanding the strategy set in the traveler's dilemma are discussed. It presents the method of using calculus to find the best response function, with examples.

6.2 Cournot Duopoly Model (1 hour)

This section explores the characteristics of the Cournot duopoly model and its application in n-person games with discrete strategies. It introduces the concept of the volunteer's dilemma and the solution methods in n-person games with continuous strategies. The concepts and solution methods of an n-player Cournot oligopoly are discussed. The behavior in games is examined: Do travelers consider a lost bag as a dilemma? Reasons are provided.

Week 7: Equilibrium Selection (3 hours)

7.1 Concepts and Principles of Equilibrium Selection (2 hour)

This section elaborates on the definition and properties of equilibrium selection, the concept and calculation methods of return functions, and focal points.

7.2 Forward Induction (1 hour)

This section primarily discusses the concept steps of forward induction and the related equilibrium concepts.

Week 8: Subgames (3 hours)

8.1 Concepts and Principles of Subgames (1 hour)

This section explains the definition and categorization of subgames, the concept and categorization of subgame solutions, and the refined Nash equilibrium in subgames and perfect subgame equilibrium.

8.2 Solution and Application of Subgames (2 hours)

This section discusses the solution methods for subgames, backward induction, and strategies, as well as the application of subgames in areas such as business and social interactions.

Week 9: Midterm Review (3 hours)

Week 10-Week 16: Classic Game Theory and Behavioral Paper Discussions (24 instructional hours)

Guided by individual student interests, facilitate the selection of topics related to classic academic papers. Encourage independent reading and in-depth research, followed by presentations on chosen papers. Subsequently, engage in extensive classroom discussions aimed at deepening understanding and exploration of the paper's topics, with a particular focus on enhancing comprehension of game theory. Furthermore, emphasize tracking the latest research developments in the academic field to timely grasp and discuss the cutting-edge content of current game theory research.

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

主要教材: Carpenter, J., & Robbett, A. (2022). Game Theory and Behavior. The MIT Press

推荐参考书目:

- Pinker, S. (2021). Rationality: What It Is, Why It Seems Scarce, Why It Matters. Penguin Press.
- Jackson, M. O. (2018). The Human Network. Pantheon Books.
- 卡尼曼, D. (2012). 思考, 快与慢. 机械工程出版社.
- 阿克洛夫, G., & 席勒, R.J. (2009). 动物精神: 如何运用人性理解经济. 中信出版社.
- 泰勒, R., 桑斯坦, C., (2018) 助推: 关于健康、财富与幸福的决策. 复旦大学出版社. 其他国内外关于行为经济学的经典论文和著作, 以及实证研究与案例分析。

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				
课堂表现 Class Performance	日常	10%		日常考勤
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments				
期中考试 Mid-Term Test	第十周	60%		课堂闭卷考试
期末考试 Final Exam				
期末报告 Final Presentation	第十六周	30%		
其它 (可根据需要 改写以上评估方式) Others (The above may be modified as necessary)				


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



任课教师: 

教学主管:

