厦门大学研究生课程教学大纲与教学计划

学院 经济学院 系（所） 所有 专业 所有

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| 课程名称（中文） | 数理经济学  | 课程名称（英文） | Mathematical Economics I |
| 课 程编 码 |  | 周学时 | 4 | 学分 | 3 |
| 总学时 | 56 |
| 开 课对 象 | 经济学院一年级硕、博研究生 | 任课教师及 职 称 | 林细细（副教授）耿森（助理教授） |
| 先修课程与预备知识 | 中级微观经济学 高等数学（微积分，线性代数，概率统计） |
| 课程目标 | This course is designed to introduce to a wide range of mathematical techniques used in graduate level economics courses. Topics include the tools used to analyze equilibrium models, comparative-static models and optimization.  |
| 教材与主要参考书目 | Mathematics for Economists, First Edition, by Carl P. Simon and Lawrence Blume Mathematical methods and models for economists ，Angel de la Fuente， Cambridge University Pr.,2000 |
| 主要内容提要 | 1: Euclidean Spaces (Ch 10) In this chapter, we begin with studying how to generalize notions of points, lines, planes, distances, and angles to n-dimensional Euclidean spaces. Later, our analyses of n-commodity economies will make heavy use of these concepts.2: Linear Independence (Ch 11) In this chapter, we begin with the definition and characterization of linear independence. The complementary notion of span and the concept of a basis for Euclidean space are then introduced.3: Limits and Open Sets (Ch 12)This chapter focuses on studying in some detail the notions of sequence, limit, neighborhood, open set and closed set.4: Functions of Several Variables (Ch 13)This chapter begins the study of nonlinear functions of several variables. It develops some vocabulary for working with multivariable functions and indicates how to visualize these underlying relationships geometrically, at least, when there are only three or four variables involved.5: Calculus of Several Variables (Ch 14)A primary goal in economic analysis is to understand how a change in one economic variable affects another. This chapter introduces multivariable calculus as the primary tool for understanding how variables affect others in economic relationships described by functions of several variables.6: Implicit Functions and Their Derivatives (Ch 15)Frequently, the equations which arise naturally have the exogenous variables mixed in with the endogenous variables. We still want to answer the basic question: how does a small change in one of the exogenous variables affect the value of the endogenous variable? This chapter will demonstrate how to answer this question for implicit functions.7: Quadratic Forms and Deﬁnite Matrices (Ch 16) The natural starting point for the study of optimization problems is the simplest such problem: the optimization of a quadratic form. This chapter studies some basic properties about quadratic forms and definite matrices. 8: Unconstrained Optimization(Ch 17)Since optimization plays such a major role in economic theory, this chapter on unconstrained optimization can be considered a core of this course. This chapter turns from the matrix criteria that specify the conditions for optimizing a quadratic form to the first and second order derivative conditions that characterize the optima of a general differentiable function. |
|  | 9: Constrained Optimization (Ch 18)This chapter begins the treatment of constrained maximization problems. We bring all the mathematical background of the previous chapters to bear on this central topic of economic theory.10: Constrained Optimization II (Ch 19)This chapter continues our study of the central mathematical technique in economic theory: the solution of constrained optimization problems. We look at three other aspects of the Lagrangian approach.11: Homogeneous and Homothetic Functions (Ch 20) This chapter examines the important properties of a special kind of functions which arise in economic models: homogeneous functions and homothetic functions.12: Concave and Quasiconcave Functions (Ch 21) Concave functions play a role in economic theory similar to the role that homogeneous functions play. This chapter examines the important properties of concave and quasiconcave functions.13: Limits and Compact sets(Ch29)This chapter continues the discussion about sequences, limits, and open, closed, and compact sets that was started in earlier chapters. These are the main ideas that quantify the notions of nearness, small change, trends, and convergent behavior. In particular, this chapter covers Cauchy sequences, compact sets, connected sets, and alternative norms for Euclidean space. |
| 教 学 进 度 安 排 |
| 时间 | 教学内容 | 主讲人 | 教学方式 | 备注 |
| Week 1 | Euclidean Spaces (Ch 10) | 林细细 耿森 | 讲座 |  |
| Week 2 | Linear Independence (Ch 11) | 林细细 耿森 | 讲座 |  |
| Week 3 | Limits and Open Sets (Ch 12) | 林细细 耿森 | 讲座 |  |
| Week 4 | Functions of Several Variables (Ch 13) | 林细细 耿森 | 讲座 |  |
| Week 5 | Calculus of Several Variables (Ch 14) | 林细细 耿森 | 讲座 |  |
| Week 6 | Implicit Functions and Their Derivatives (Ch 15) | 林细细 耿森 | 讲座 |  |
| Week 7 | Quadratic Forms and Deﬁnite Matrices (Ch 16)  | 林细细 耿森 | 讲座 |  |
| Week 8 | Unconstrained Optimization(Ch 17) **期中考 11.12上午（周六），Ch10-15** | 林细细 耿森 | 讲座 |  |
| Week 9 | Constrained Optimization (Ch 18) | 林细细 耿森 | 讲座 |  |
| Week 10 | Constrained Optimization II (Ch 19) | 林细细 耿森 | 讲座 |  |
| Week 11 | Homogeneous and Homothetic Functions (Ch 20) | 林细细 耿森 | 讲座 |  |
| Week 12-13 | Concave and Quasiconcave Functions (Ch 21)  | 林细细 耿森 | 讲座 |  |
| Week 14 | Limits and Compact sets(Ch29) | 林细细 耿森 | 讲座 |  |
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| 考试方式及成绩比例 | 闭卷，全院统一考试。平时成绩占20 %、期中成绩30 %、期末成绩50 % |
| 院系分管领导意见 | （签章）：年 月 日 |

（本表可加页）