COURSE OUTLINE

I. Catalog Description

Introduction to game theoretic approaches, particularly simultaneous and sequential games, games with Nash equilibria and Prisoners’ Dilemma, coordination games, uncertainty, and strategic moves. Develop strategic thinking skills by applying game theoretic approaches to economics, business, politics, psychology and legal problems.

4 lecture discussions. Prerequisites: EC 201.

II. Required Background or Experience

EC 201.

III. Expected Outcomes

Students in EC 425 will:

a) develop basic game theory concepts such as pay-off matrices, extensive form presentations of games, as well as best response graphs, and the underlying algebra,

b) utilize game theory techniques, such as Nash Equilibria, for pure and mixed strategies as well as rollback to solve game theoretic problems, and

c) classify real life strategic situations as specific types of games, and strategic reactions to different situations as suggested by the underlying game theory models.
IV. **Text and Readings**

**Texts:**


**Readings:**


**References:**

Games and Economic Behavior

International Journal of Game Theory (IJGT)

International Game Theory Review (IGTR)

International Journal of Mathematics, Game Theory and Algebra (IJMGTA)

Public Choice

V. **Minimum Student Materials**

Textbooks, notebooks, and access to library materials and personal computers.

VI. **Minimum College Facilities**

Seminar room equipped with audio-visual equipment.
VII. Course Outline

A. Introduction

B. A Classification of Strategic Situations and Games
   1. Sequential or Simultaneous Games
   2. Conflict or Commonality Games
   3. Single or Repeated Games
   4. Cooperative or Non-Cooperative Games

C. Key Concepts for Simultaneous Games
   1. Pay-Off Matrix
   2. Zero Sum Games
   3. Dominant Strategies
   4. Nash Equilibria
   5. Prisoners' Dilemma

D. Using the ATMUS Approach to Develop Strategies for a Prisoners' Dilemma Situation with an Unknown Number of Rounds

E. Key Concept for Sequential Games
   1. Game Trees
   2. Rollback
   3. Order Advantages

F. Simultaneous Games with Mixed Strategies
   1. Definition of a Mixed Strategy
   2. Why Playing a Mixed Strategy?
   3. Zero-Sum Games
   4. Non-Zero-Sum Games

G. Uncertainty and Information
   1. Asymmetric Information
   2. Cheap Talk (Direct Communication)
   3. Signaling and Screening
   4. Incentive Payments

H. Strategic Moves
   1. Credibility
   2. Commitments
   3. Threats and Promises

I. Evolutionary Games
VIII. Instructional Methods

(a) Presentations and discussions of assigned text chapters and readings in class complemented by on-line materials.
(b) ATMUS a cooperative class experiment to develop a strategy for a Prisoners’ Dilemma situation.

IX. Evaluation of Outcomes

Students will be evaluated in four areas:

(a) Midterm exam
(b) Performance and presentation of created game theory strategy in the ATMUS experiment
(c) Final
(d) Class activities