NEW COURSE FORM

Signature Routing Log

General Information:
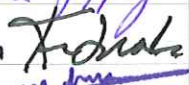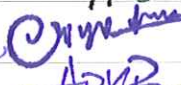
Course Prefix and Number: MA/ECO 327

Proposal Contact Person Name: Robert Molzon   Phone: 257-1480   Email: molzon@ms.uky.edu

INSTRUCTIONS:
Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Math Faculty	4/29/2010	Zhongwei Shen / 257-3470 / zshen2@uky.edu	
Robert Molzon	4/29/2010	R Molzon / 71480 / molzon@ms.uky.edu	
Econ Faculty	4/29/2010	Ken Troske / 257-1382 / ktroske@uky.edu	
A&S Ed. Policy Cmte	9/21/10	G.Murthy / 7-1291 / genpathy.murthy@uky.edu	
A&S Dean	9/21/10	A.Bosch / 7-6689 / bosch@uky.edu	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[6]
Undergraduate Council	10/26/2010		
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

[6] Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

Rev 8/09

NEW COURSE FORM

1. General Information.

a. Submitted by the College of: _Arts and Sciences_   Today's Date: _11 March 2010_

b. Department/Division: _Mathematics/Economics_

c. Contact person name: _Robert Molzon_   Email: _molzon@ms.uky.edu_   Phone: _257-1480_

d. Requested Effective Date: ☒ Semester following approval   OR ☐ Specific Term/Year[1] :_

2. Designation and Description of Proposed Course.

a. Prefix and Number: _MA/ECO 327_

b. Full Title: _Strategic Decision Making: An Introduction to Game Theory_

c. Transcript Title (if full title is more than 40 characters): _Introduction to Game Theory_

d. To be Cross-Listed[2] with (Prefix and Number): _ECO 327_

e. Courses must be described by <u>at least one</u> of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.

3 Hours Lecture	_____ Laboratory[1]	_____ Recitation	_____ Discussion	_____ Indep. Study
_____ Clinical	_____ Colloquium	_____ Practicum	_____ Research	_____ Residency
_____ Seminar	_____ Studio	_____ Other – Please explain: _____		

f. Identify a grading system: ☒ Letter (A, B, C, etc.)   ☐ Pass/Fail

g. Number of credits: _3_

h. Is this course repeatable for additional credit?   YES ☐   NO ☒

If YES: Maximum number of credit hours: _____

If YES: Will this course allow multiple registrations during the same semester?   YES ☐   NO ☒

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[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

[2] The chair of the cross-listing department must sign off on the Signature Routing Log.

[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from SR 5.2.1)

Rev 8/09

NEW COURSE FORM

i.	Course Description for Bulletin:	The course is an introduction to strategic decision making and game theory. Ideas such as Nash equilibrium, dominant strategies, evolutionary stability, and asymetric information are applied to a variety of strategic decision making problems taken from economics, computer science, politics, and biology.
j.	Prerequisites, if any:	A grade of B or better in MA 113 or MA 132 or MA 137 or consent of department. Students should have a strong background in first semester calculus.

k.	Will this course also be offered through Distance Learning?	YES[4] ☐	NO ☒

l.	Supplementary teaching component, if any:	☐ Community-Based Experience	☐ Service Learning	☐ Both

3.	**Will this course be taught off campus?**	YES ☐	NO ☒

4.	**Frequency of Course Offering.**

a.	Course will be offered (check all that apply):	☐ Fall	☒ Spring	☐ Summer

b.	Will the course be offered every year?	YES ☒	NO ☐
	If NO, explain:		

5.	**Are facilities and personnel necessary for the proposed new course available?**	YES ☒	NO ☐
	If NO, explain:	—	

6.	**What enrollment (per section per semester) may reasonably be expected?**	25

7.	**Anticipated Student Demand.**

a.	Will this course serve students primarily within the degree program?	YES ☒	NO ☐
b.	Will it be of interest to a significant number of students outside the degree pgm?	YES ☒	NO ☐
	If YES, explain:	The course should be of interest to students in a wide variety of disciplines including computer science, biology, economics, mathematics, as well as mathematical economics.	

8.	**Check the category most applicable to this course:**
	☒ Traditional – Offered in Corresponding Departments at Universities Elsewhere
	☐ Relatively New – Now Being Widely Established
	☐ Not Yet Found in Many (or Any) Other Universities

9.	**Course Relationship to Program(s).**

a.	Is this course part of a proposed new program?	YES ☐	NO ☒
	If YES, name the proposed new program:	—	

NEW COURSE FORM

b.	Will this course be a new requirement[5] for ANY program?	YES ☐	NO ☒

	If YES[5], list affected programs:	_____

10. **Information to be Placed on Syllabus.**

a.	Is the course 400G or 500?	YES ☐	NO ☒

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in **10.b**. You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See *SR 3.1.4*.)

b.	☒	The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached.

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[5] In order to change a program, a program change form must also be submitted.

STRATEGIC DECISION MAKING: AN INTRODUCTION TO GAME THEORY

Strategic decision making is an essential feature of human interaction. It plays a major role in economic and social systems. Perhaps more surprisingly, strategic decision making also plays a role in biological systems, complex computer network systems, and other evolutionary systems such as human language. At a basic level, strategic decisions are those made by distinct organisms with the goal of optimizing individual gain in a competitive setting. Game theory is the mathematical tool used to model and solve strategic decision problems.

Most universities in the United States offer courses in game theory and strategic decision making, and these courses are often taught in very diverse disciplines. Here is a small table that lists universities in the first column and departments within those universities that offer a course in game theory.

University	Department
University of Pittsburgh	Economics
Brown University	Computer Science
University of Rochester	Political Science
University of British Columbia	Philosophy
University of California, Los Angeles	Mathematics
Harvard University	Division of Engineering and Applied Sci.
University of California, Berkeley	Statistics
University of California, Santa Cruz	Biology, Computer Science, Economics

The table gives a good idea of the diversity of fields that rely on an understanding of strategic decision making and game theory.

The University of Kentucky currently offers a Senior Seminar course (ECO 499) in game theory for economics majors. However there is currently no undergraduate course in game theory designed for the broad set of majors that might benefit from such a course. We are proposing a course at the 300 level that will introduce students in a wide variety disciplines to the subject. We hope that the course will help students in the social sciences appreciate quantitative methods, and perhaps go on to take more advanced courses in mathematics and economics. The Mathematical Economics Program is the perfect setting for the course and we believe many students in that program will benefit. The course would strengthen this program and make it even more attractive to the high quality students we hope to attract to the University of Kentucky.

MA327
STRATEGIC DECISION MAKING: AN INTRODUCTION TO GAME THEORY

- Day/Time/Place: TBD
- Instructor: TBD
- Office Phone: TBD
- E-Mail: TBD
- Office Address: TBD
- Office Hours: TBD
- Preferred Method of Contact: TBD
- Overview of Course: Strategic decision making is an essential feature of human interaction. It plays a major role in economic and social systems. Perhaps more surprisingly, strategic decision making also plays a role in biological systems, complex computer network systems, and other evolutionary systems such as human language. At a basic level, strategic decisions are those made by distinct organisms with the goal of optimizing individual gain in a competitive setting. Game theory is the mathematical tool used to model and solve strategic decision problems.
- Student Learning Outcomes: Upon completing this course the student should be able to
    - Explain the concept of optimization in the context of games
    - Describe simple games both mathematically and in prose form
    - Solve for equilibria in static and repeated games
    - Differentiate between the Nash approach and the Evolutionary approach to games
- Course Goals and Objectives: The objectives of the course are for the student to develop
    - Knowledge of how strategic decision problems are modeled and how these models are solved,
    - Comprehension of the different approaches to strategic decision making and the solution concepts,
    - Ability to apply methods learned in the course to new strategic decision problems, and to be able to solve these problems
    - Ability to analyze strategic decision models that have been proposed by leaders in society for the solution of complex multi-objective problems.
- Required Materials: The required text for the course is Strategy:An Introduction to Game Theory by J. Watson, 2nd Edition, Norton 2008.
- Grading:
    - Numerical Grading Scale: A 90-100, B 80-89, C 70-79, D 60-69, E below 60
    - Relative Value to Components: Midterm 30%, Problem Sets 30%, Final 40%
- Tentative Course Schedule:

1

- Midterm shall be held during the 6th week of the course, *and midterm grades posted 48hrs after exam date*
- Final shall be held during the time scheduled by Registrar,
- Problems sets shall be assigned once per week and collected one week after they are assigned. Weekly topics are listed below.
    * Introduction
    * Prisoner's dilemma games and strategic form games
    * Dominant strategies and iterative deletion
    * Best response and rationalizability
    * Nash equilibrium and applications
    * Imperfect competition
    * Shelling location games
    * Games with incomplete information
    * Mixed strategies
    * Evolution and game theory
    * Evolutionary stable strategies
    * Auctions

- Course policy of academic accommodations due to disability: If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

- Course policy for attendance: Attendance will be recorded by calling on students to answer questions in class. If you are called upon but are not present your absence will be recorded. You are allowed four unexcused absences during the semester. After that you two points for each unexcused absence will be deducted from your total course average used to determine your final letter grade. Excused absences will be given at instructor's discretion only with proof as defined by S.R. 5.2.4.2. For further information see http://www.uky.edu/StudentAffairs/Code/part2.html .
    - Make-up opportunities: The instructor shall give the student an opportunity to make up the work and/or the exam missed during an excused absence..." implies the student shall not be penalized for the excused absence.
    - Verification of Absences: Students missing work due to an excused absence bear the responsibility of informing the instructor about their excused absence within one week following the period of the excused absence (except where prior notification is required), and of making up the missed work.

- Course policy for submission of assignments: Students shall return all assignments on the due date. No late assignments shall be accepted without an excused absence.

- Course policy on academic integrity: All assignments, projects, and exercises completed by students for this class should be the product of the personal efforts of the individual(s) whose name(s) appear on the corresponding assignment. Misrepresenting others' work as one's own in the form of cheating or plagiarism is unethical and will lead to those penalties

outlined in the University Senate Rules (6.3.1 & 6.3.2) at the following website: http://www.uky.edu/USC/New/rules_regulations/index.htm. The Ombud site also has information on plagiarism found at http://www.uky.edu/Ombud.

- Course policy on classroom civility and decorum: The university, college and department has a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right – and the responsibility – to ensure that all academic discourse occurs in a context characterized by respect and civility. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.

University Senate Syllabi Guidelines

General Course Information
- ☐ Full and accurate title of the course.
- ☐ Course prefix, number and section number.
- ☐ Departmental and college prefix.
- ☐ Scheduled meeting day(s), time and place.

Instructor Contact Information (if specific details are unknown, "TBA" is acceptable for one or more fields)
- ☐ Instructor name.
- ☐ Contact information for teaching/graduate assistant, etc.
- ☐ Preferred method for reaching instructor.
- ☐ Office phone number.
- ☐ Office address.
- ☐ UK email address.
- ☐ Times of regularly scheduled office hours and if prior appointment is required.

Course Description
- ☐ Reasonably detailed overview of the course.
- ☐ Student learning outcomes.
- ☐ Course goals/objectives.
- ☐ Required materials (textbook, lab materials, etc.).
- ☐ Outline of the content, which must conform to the Bulletin description.
- ☐ Summary description of the components that contribute to the determination of course grade. *9/3/10 added by hand*
- ☐ Tentative course schedule that clarifies topics, specifies assignment due dates, examination date(s). *by*
- ☐ Final examination information: date, time, duration and location.
- ☐ For 100-, 200-, 300-, 400-, 400G- and 500-level courses, numerical grading scale and relationship to letter grades for *undergraduate* students.
- N/A ☐ For 400G-, 500-, 600- and 700-level courses, numerical grading scale and relationship to letter grades for *graduate* students. (Graduate students cannot receive a "D" grade.)
- ☐ Relative value given to each activity in the calculation of course grades (Midterm=30%; Term Project=20%, etc.).
- ☐ Note that undergraduate students will be provided with a Midterm Evaluation (by the midterm date) of course performance based on criteria in syllabus.
- ☐ Policy on academic accommodations due to disability. Standard language is below:
  > If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Course Policies
- ☐ Attendance.
- ☐ Academic integrity, cheating & plagiarism.
- ☐ Excused absences.
- ☐ Classroom behavior, decorum and civility.
- ☐ Make-up opportunities.
- N/A ☐ Professional preparations.
- ☐ Verification of absences.
- N/A ☐ Group work & student collaboration.
- ☐ Submission of assignments.