

## **EXPERIMENTAL ECONOMICS - ECON 496-006**

MW 1:30 pm - 2:45 pm, Innovation Hall, Room 338

Instructor: Kevin A. McCabe

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Prerequisites: ECON 306 and STAT 250 and 350 or permission of instructor.

Office Hours: MW 3:30-5:00 Room 101 in the Krasnow Building

Drop Dates: Drop without Tuition Penalty: Nov 02, 2010 to Feb 08, 2011  
Drop with Tuition Penalty: Feb 09, 2011 to Feb 25, 2011

Readings and Resources: Readings will be made available to you by shared drop box which you will be invited to on the first day of class.

A good online python textbook for beginners is called [How To Think Like a Computer Scientist - Learning with Python](http://openbookproject.net/thinkcs/python/english2e/) and is available at <http://openbookproject.net/thinkcs/python/english2e/>

For the course you will need to download some freeware software products onto your computer. These are as follows:

Python 2.x: <http://wiki.python.org/moin/BeginnersGuide>  
An easy to learn scripting/programming language

EconWillow: <http://econwillow.sourceforge.net/>  
Lets you run economics experiments in Python

AMAYA: <http://www.w3.org/Amaya/>  
For viewing and building HTML web pages

Kokua: <http://wiki.kokuaviewer.org/wiki/Downloads>  
Also known as the Imprudence viewer. A client viewer for virtual worlds

## COURSE DESCRIPTION

Experimental economics is a branch of economics that uses laboratory and field experiments to study the mechanisms that govern economic phenomena. In 2002 Vernon Smith received the Nobel Prize in Economics, for his work in experimental economics, after arriving at GMU in 2001. Vernon founded the Interdisciplinary Center for Economic Science at GMU. You can learn more about this center at the following website: <http://ices.gmu.edu/>. This course is designed specially to introduce undergraduate students to experimental economics. Through this course students will have the opportunity to: read and discuss some of the most influential papers in experimental economics; learn how to design and implement an economics experiment; and see firsthand a cutting edge research program in experimental economics.

This course is valuable to students for the following reasons. For students planning to work in the field of economics, or related fields, such as business, law, finance, or politics, the use of experiments is becoming increasingly important. The material you learn in this class will give you the skills to think about, plan, and execute an experiment. For students planning to go on to graduate school this course exposes you to the thought process and methods involved in knowledge discovery. While graduate level work is more difficult, it is also more focused. This class will help you see the broader purpose of experiments and will help you maintain focus on your graduate goals. For all students, this class will introduce you to some of the discovered knowledge which has and continues to influence the way we think about the world. At the same time you will get started learning several high tech skills including, how to program a computer, and how to create a web page, which will help you succeed in today's world.

Benjamin Franklin has a famous quote on teaching and learning which I've made the guiding philosophy of this class. It goes like this

**“Tell me and I forget.**

**Teach me and I remember.**

**Involve me and I learn.”**

With this quote in mind my goal in designing this course is to involve you in experimental economics. To do this I've made the course self contained and accessible to undergraduate students. The first two thirds of the class is designed to give you a working knowledge of experimental economics. On the first day of the week we will look at how the experimental economist thinks about the world by examining in detail some of the most influential experimental papers in economics. We will start the class with a discussion of the paper. You must read, and prepare to discuss, these papers before each class. Choosing papers to discuss is always subjective, but my criteria were simple. The paper had to be accessible to an undergraduate, and it had to have at least four hundred citations according to Google Scholar.

On day two of the week we will construct a networked experiment using a scripting language called Python, an experimental framework called EconWillow, which uses HTML web pages for the subject interface. No previous programming experience is necessary! You will build skills in programming and web design in class and through examples and homework exercises as you need them.

In the last third of the course students will learn about our ongoing research program. This program uses virtual worlds to study how economic institutions emerge. Students will participate in an experiment, and then go behind the scenes to see what motivates the research, how the experiment was built, how data is being analyzed, and what lessons are being learned.

The course uses four open source programs that can be freely downloaded from the web. The links for this software is on the front page. These resources include, Python -- a general purpose scripting language, EconWillow -- a lightweight python framework for running python coded experiments, and AMAYA -- an HTML editor and browser, and the Kokua/Imprudence viewer which will allow you to sign on to our research islands on Second Life and ReactionGrid.

## **GRADING AND COURSE REQUIREMENTS**

Your grade for this course will be based on class participation (30%), a midterm (30%), and a final (40%).

For your class participation grade you must attend class, prepare discussion material, and participate in the class discussion.

The midterm will be on March 30 and will consist of multiple choice questions and one short essay. The midterm will cover the course material up to and including March 23. There will be a review held in class on March 28.

The final will be held on May 11, 1:30 pm - 4:15 pm, and will consist of multiple choice questions and two short essays. The final will be cumulative. There will be a review for the final in class on May 4.

## TENTATIVE COURSE SCHEDULE

### Week One: Introduction to Class

Jan 24 50 Years of Experimental Economics

Jan 26 Discuss -- Smith: Economics in the Laboratory

Vernon Smith, 1994. Economics in the Laboratory. The Journal of Economic Perspectives, Vol. 8, No. 1 (Winter, 1994), pp. 113-131.

Lecture -- The Induced Value Method

Install Python -- See page one

Think Like a Computer Scientist: Chapter 1

### Week Two: Price Discovery

Jan 31 Discuss -- Smith: An Experimental Study of Competitive Market Behavior

Vernon Smith, 1962. An Experimental Study of Competitive Market Behavior. The Journal of Political Economy, Vol. 70, No. 2 (Apr., 1962), pp. 111-137.

Lecture -- Price Discovery

Feb 2 Lecture -- Python Programming

Think Like a Computer Scientist: Chapter 2 - Chapter 5

### Week Three: Asset Markets

Feb 7 Discuss -- Smith, Suchanek, Williams: Bubbles, Crashes, and Endogenous Expectations

Vernon L. Smith, Gerry L. Suchanek, Arlington W. Williams, 1988. Bubbles, Crashes, and Endogenous Expectations in Experimental Spot Asset Markets. Econometrica, Vol. 56, No. 5 (Sep., 1988), pp. 1119-1151.

Lecture -- Asset Markets

Feb 9 Lecture -- Python Programming

Think Like a Computer Scientist: Chapter 6 - Chapter 8

#### **Week Four: Economic Systems Design**

Feb 14 Discuss -- Rassenti, Smith, Bulfin: A Combinatorial Auction Mechanism

S. J. Rassenti, V. L. Smith, R. L. Bulfin, 1982. A Combinatorial Auction Mechanism for Airport Time Slot Allocation. Source: The Bell Journal of Economics, Vol. 13, No. 2 (Autumn, 1982), pp. 402-417

Lecture -- Economic Systems Design

Feb 16 Lecture -- Python Programming

Think Like a Computer Scientist: Chapter 9 - Chapter 12

#### **Week Five: Public Goods**

Feb 21 Discuss -- Issac, Walker: Group Size Effects in Public Goods

R. Mark Isaac and James M. Walker, 1988. Group Size Effects in Public Goods Provision: The Voluntary Contributions Mechanism. The Quarterly Journal of Economics, Vol. 103, No. 1 (Feb., 1988), pp. 179-199

Lecture -- Public Goods

Feb 23 Lecture -- Designing a Computerized Experiments

#### **Week Six: Bargaining**

Feb 28 Discuss -- Guth, Schmittberger, Schwarze: Ultimatum Bargaining

Werner Güth, Rolf Schmittberger, Bernd Schwarze, 1982. An experimental analysis of ultimatum bargaining. Journal of Economic Behavior & Organization, Volume 3, Issue 4, December 1982, Pages 367-388.

Lecture -- Bargaining

Mar 2 Lecture -- HTML and Web Page Programming

Download and Install EconWillow and Amaya  
EconWillow Manual Sections 1 - 6 & Lesson 0  
Amaya Manual Chapter One

## **Week Seven Other Regarding Behavior**

Mar 7 Discuss -- Hoffman, McCabe, Smith: Social Distance

Elizabeth Hoffman, Kevin McCabe, Vernon L. Smith, 1996. Social Distance and Other-Regarding Behavior in Dictator Games. The American Economic Review, Vol. 86, No. 3 (Jun., 1996), pp. 653-660.

Lecture -- Other Regarding Behavior

Mar 9 Lecture -- Programming an EconWillow Experiment

EconWillow Manual Lessons 1 - 10

## **Spring Break**

## **Week Eight Personal Exchange**

Mar 21 -- Discuss -- Berg, Dickhaut, McCabe: Trust, Reciprocity, and Social History

Berg, Joyce, John Dickhaut, and Kevin McCabe, 1995. Trust, Reciprocity, and Social History. Games and Economic Behavior, Volume 10, Issue 1, July 1995. Pages 122-142

Lecture: Personal Exchange

Mar 23 -- Programming an EconWillow Experiment

Bargaining Program Specification and Instructions

## **Week Nine Midterm Exam**

Mar 28 Midterm Review

Mar 30 Midterm

**Week Ten                    Virtual Worlds (VW)**

Apr 4 -- In world exercise: Learning to Control Your Avatar

Download and Install the Kokua Viewer (see Page One)

Apr 6 -- HTML Screen Designs for the Bargaining Experiment

**Week Eleven                A VW Experiment**

Apr 11 -- Participating in a VW Experiment

Apr 13 -- Subject Programming for the Bargaining Experiment

**Week Twelve                A VW Research Program**

Apr 18 -- Building a Shareable VW Data Pipeline

Apr 20 -- Monitor Programming for the Bargaining Experiment

**Week Thirteen             Processing VW Language**

Apr 25 -- Building a Language Production Pipeline

Apr 27 -- Running the Bargaining Experiment in the Laboratory

**Week Fourteen             Course Wrap Up**

May 2 -- Lecture on Language and Games in Second Life Experiment

May 4 Final Review

## **UNIVERSITY POLICIES and RESOURCES**

### **ACADEMIC INTEGRITY**

Mason is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

### **MASON EMAIL ACCOUNTS**

Students must use their MasonLIVE email account to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

### **OFFICE OF DISABILITY SERVICES**

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. <http://ods.gmu.edu>

### **OTHER USEFUL CAMPUS RESOURCES:**

WRITING CENTER: A114 Robinson Hall; (703) 993-1200; <http://writingcenter.gmu.edu>

UNIVERSITY LIBRARIES "Ask a Librarian"  
<http://library.gmu.edu/mudge/IM/IMRef.html>

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380;  
<http://caps.gmu.edu>

### **UNIVERSITY POLICIES**

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at <http://universitypolicy.gmu.edu/>. All members of the university community are responsible for knowing and following established policies.