ECO 4401: Mathematical Economics

Dr. Thomas Knight   **Spring 2018**
Office: MAT 340   **Course Time: M/W 9:35-11:30am**
Office Hours: T/R 4:00-5:00pm   **Course Location: MAT 14**
                                                         Email: thomas.knight@ufl.edu

Prerequisites: **Intermediate Microeconomics (ECO 3101) and Calculus I**
                            (MAC 2233 *or equivalent*)
Required Text: **"Fundamental Methods of Mathematical Economics, 4th Edition" by Alpha**
                            Chiang and Kevin Wainwright (*Custom edition available in UF Bookstore***)**

FIRST WEEK	**1) Read the Syllabus**
READING	**2) Complete the "Student Information Form" (Page 7)**
ASSIGNMENTS	**3) Review Chapters 1 and 2**

STUDENT RESPONSIBILITIES *--be careful to read the syllabus for unique features of this course*
• Continued enrollment in this course is equivalent to acceptance of all stated responsibilities, policies, and due dates. If there is anything that is unclear, talk to me *immediately*. Waiting until the end of the term often results in less favorable outcomes.
• Students are expected to attend and participate actively in this course. It is assumed that you have read the assigned material before attending class and are prepared to answer questions based on the readings.
•I ask a number of directed questions during the lecture period of the course. Students are selected at random (without replacement -- *in order to ensure that all students have an equal opportunity to answer questions*) to answer questions based on the required readings and lecture material. These questions are not intended to trick you or "test" you on the required readings; they are simply intended to enhance course participation. You are free to "take a pass" if you do not feel comfortable answering a particular question.
• Students are expected to complete 9 analytic problem sets. These problem sets relate to the topics of the preceding lectures and are intended to offer you practice with the relevant mathematical techniques. In some cases, questions offer important extensions of the material covered in class. All problem sets are due at the beginning of class (i.e., 9:35am) on the due date; late problem sets will not be accepted for partial credit. *See Page 2 for a more thorough explanation of problem sets.*
• Students are expected to present their solutions to the analytic problem sets and other in-class handouts during class. On days when problem sets are due, the first portion of the course period is dedicated to student presentations of selected solutions. Students are selected at random (without replacement -- *in order to ensure that all students have an equal opportunity to answer questions*) to present their solutions. If you are unsure of the solution, I will assist you in presenting the answer, but you will not be able to "take a pass."
•Students will be able to collect their problem sets from me for their solution presentations. However, you will not have your problem sets when other students are presenting. *I recommend making a photocopy of your problem set if you want to check your answers against the solutions presented in class.*
• Any lapse of appropriate conduct while a fellow classmate is presenting may result in a final course grade reduction of two letter grades (e.g., from an A- to a C-). This includes not paying attention to another student's solution. Many people are afraid to present their own work in front of their peers, and it is our shared obligation to make their presentation as painless as possible.
•You will be responsible for writing a 4-7 page paper with an assigned group, and all groups will present their papers at the end of the course. Presentations will be held during two class sessions at the end of the course, and each group will have 15 minutes to present. All students must attend both of these sessions. You will not be told in which of these two sessions your group will be presenting. Groups will be evaluated on both their presentation and the paper they submit. A rubric will be made available after Spring Break.
•There are two in-class exams: Exam 1 (February 28) and Exam 2 (April 23).

ANALYTIC PROBLEM SET INFORMATION AND GUIDELINES
•All problem sets are due at 9:35am. Late problem sets (even those turned in at 9:40am) will not be accepted.
•Students are required to demonstrate all of their work and provide thorough explanations to receive credit! Attach all work on additional sheets of paper. The problem sets do not have enough space for you to show your work and provide the required explanations.
•You may work in groups. In fact, I highly recommend it. You are, however, required to submit individual problem sets for grading. Copying another student's work is not permissible and constitutes a violation of the UF Student Honor Code.
•Keep your problem sets when I hand them back!! Some questions may refer to others from past sets.

GRADING POLICY AND SCALE
• Grades are calculated as follows: Problem Sets and Participation (15%), Exam 1 (30%), Exam 2 (30%), and Final Paper (25%).
• Make-up exams must be arranged before the exam date/time and will only be offered for UF-related conflicts and religious holidays. Keep in mind that your academic obligations *always* take precedence over personal and social commitments.
• Unexcused absences from in-class exams result in a grade of 0 for that exam.
• No Incompletes   No Grade Changes   No Extensions   No Substitute Work

92.50-100	*A*	*77.50-79.99*	*C+*
90.00-92.49	*A-*	*72.50-77.49*	*C*
87.50-89.99	*B+*	*70.00-72.49*	*C-*
82.50-87.49	*B*	*65.00-69.99*	*D*
80.00-82.49	*B-*	*0-64.99*	*E*

A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
---AND---
http://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

COURSE RESOURCES (AND HINTS FOR SUCCESS)
• The problem sets are the greatest resource you have. These problem sets provide an almost-comprehensive review of the relevant course material and solution techniques. I highly recommend taking thorough notes when the solutions are presented in class, as solutions are *not* handed out in class.
• I provide sample exams (with solutions). These exams offer insight into the structure and difficulty level of the actual exams, but they do not necessarily cover the same material. *Also, students regularly report that sample (or old) exams are less difficult than current term exams. Be prepared for this!*
• Superficial cramming will not lead to success; keeping up with the material is essential. After each lecture, review your notes, and test whether you understand a particular concept. You may, for example, take an example from class in which I examined the effect of an income increase on a consumer's equilibrium consumption bundle and attempt to identify the effects of an income decrease. These thought exercises increase your exposure to the material and sharpen your ability to apply the analytic tools covered in class.
• As with any "tools" course (e.g., mathematics), the only way to learn the material is to practice it. Take advantage of the many resources you have.

OFFICE HOURS
• You are encouraged to attend office hours; attendance is highly correlated with success in the course.
• Attempt problem sets before you bring questions to office hours; the problem sets are substantially less beneficial if you do not attempt them on your own. To be honest, "sweating through the material" is the best way to learn it.

ATTENDANCE POLICY

Attendance follows the UF Attendance Policy strictly. Absences that are not expressly excused in the UF Catalog must be cleared with me beforehand. Moreover, failure to notify me - *before the class period in question* - of an absence for a class period in which you are selected to present a problem set or in-class hand-out solution will result in a 50% reduction in the "Problem Sets and Participation" portion of your grade. As a precaution, notify me of all absences.

The UF Attendance Policy can be found at:

http://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

GENERAL COMMENTS ON WELLNESS AND SUCCESS

College is an exciting learning experience and a unique opportunity for personal growth. It can, however, also be a stressful and difficult transitionary period. If you are ever having general issues with your coursework *in any course* or trouble in your personal life, please seek help from myself or another faculty member. I also encourage you to utilize the *FREE* and *ANONYMOUS* services of the UF Counseling and Wellness Center.

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565; www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

ACADEMIC HONESTY

You are expected to abide by the University's rules for academic honesty. These are available for your review at http://www.dso.ufl.edu/judicial/academic.php. Cheating, plagiarism, and any other action that violates these rules will be prosecuted to the fullest extent. It should be noted that creating an excuse to take a make-up exam that cannot be verified constitutes cheating under the University guidelines.

END –OF-TERM COURSE EVALUATION

I encourage you to fill out the online course evaluation form that is available at http://evaluations.ufl.edu. I will provide class time – during which I will leave the room – for you to complete this online form at the end of the term. This will be announced in advance, and you will be encouraged to bring a wifi-enabled device (e.g., a laptop, tablet, or smartphone) to class that day.

I will pass out an alternative (separate from the official University of Florida form) course evaluation form at the end of the course. The official University of Florida form does not offer much valuable information for future improvements of this course. Please, help me and future students by offering honest and thorough information -- *I greatly appreciate constructive criticism*. I will not read these evaluations until all grades have been submitted.

COURSE OUTLINE (AND ASSIGNMENT SCHEDULE)

L1   **January 8**   **Syllabus**

L2   **January 10**   **Equilibrium Analysis in Economics**
Chiang and Wainwright, **Chapter 3**
Student Information Form due at the beginning of class

January 15   **NO CLASS: MARTIN LUTHER KING JR. DAY**

L3   **January 17**   **Equilibrium Analysis in Economics**
Chiang and Wainwright, **Chapter 3**
Problem Set I due at the beginning of class (9:35am).

L4   **January 22**   **Linear Models and Matrix Algebra**
Chiang and Wainwright, **Chapter 4**

L5   **January 24**   **Linear Models and Matrix Algebra**
Chiang and Wainwright, **Chapter 4**

L6   **January 29**   **More of Linear Models and Matrix Algebra**
Chiang and Wainwright, **Chapter 5**
Problem Set II due at the beginning of class (9:35am).

L7   **January 31**   **More of Linear Models and Matrix Algebra**
Chiang and Wainwright, **Chapter 5**

L8   **February 5**   **Concept of Derivative and Rules of Differentiation**
Chiang and Wainwright, **Chapter 7**
Problem Set III due at the beginning of class (9:35am).

L9   **February 7**   **Comparative Static Analysis of General-Function Models**
Chiang and Wainwright, **Chapter 8**

L10   **February 12**   **Comparative Static Analysis of General-Function Models**
Chiang and Wainwright, **Chapter 8**

L11   **February 14**   **Unconstrained Univariate Optimization**
Chiang and Wainwright, **Chapter 9**
Problem Set IV due at the beginning of class (9:35am).

L12   **February 19**   **Exponential and Logarithmic Functions**
Chiang and Wainwright, **Chapter 10**

L13   **February 21**   **Exponential and Logarithmic Functions**
Chiang and Wainwright, **Chapter 10**
Problem Set V due at the beginning of class (9:35am).

February 26   **Exam Review**

February 28   **Exam 1**

March 5		**NO CLASS: SPRING BREAK**
March 7		**NO CLASS: SPRING BREAK**
L14	**March 12**	**Unconstrained Multivariate Optimization** *Chiang and Wainwright*, **Chapter 11**
L15	**March 14**	**Unconstrained Multivariate Optimization** *Chiang and Wainwright*, **Chapter 11**
L16	**March 19**	**Multivariate Optimization with Equality Constraints** *Chiang and Wainwright*, **Chapter 12** **Problem Set VI due at the beginning of class (9:35am).**
L17	**March 21**	**Multivariate Optimization with Equality Constraints** *Chiang and Wainwright*, **Chapter 12**
L18	**March 26**	**Multivariate Optimization with Inequality Constraints** *Chiang and Wainwright*, **Chapter 13** **Problem Set VII due at the beginning of class (9:35am).**
L19	**March 28**	**Multivariate Optimization with Inequality Constraints** *Chiang and Wainwright*, **Chapter 13**
L20	**April 2**	**Multivariate Optimization with Inequality Constraints** *Chiang and Wainwright*, **Chapter 13**
L21	**April 4**	**Multivariate Optimization with Inequality Constraints** *Chiang and Wainwright*, **Chapter 13**
L22	**April 9**	**First-Order Differential Equations** *Chiang and Wainwright*, **Chapter 15** **Problem Set VIII due at the beginning of class (9:35am).**
L23	**April 11**	**First-Order Differential Equations** *Chiang and Wainwright*, **Chapter 16**
April 16		**GROUP ORAL PRESENTATIONS** **Problem Set IX due at the beginning of class (9:35am).**
April 18		**GROUP ORAL PRESENTATIONS**
April 23		**EXAM 2** **FINAL PAPER DUE**

Student Information Form **Spring 2018**

ECO 4401: Mathematical Economics

Name: **Phone Number:**

Major: **Email Address:**

Year (e.g., junior): **May I include your phone number on the class list?** Yes_____ No_____

May I include your email address on the class list? Yes_____ No_____

Intermediate Microeconomics and *Calculus* are prerequisites for this course. Please confirm that you meet these requirements.

Which economics courses have you taken? Please make note of courses that were taken as Advanced Placement (AP) or at another college or university.

Which math courses have you taken? Please make note of courses that were taken as Advanced Placement (AP) or at another college or university.

What attracts you to the study of mathematical economics? What particular areas of economic inquiry interest you?

Are there any additional comments that you would like to provide?