ECO 4401: Mathematical Economics
Syllabus

Instructor: Gunnar Heins (Part I) & Thomas Knight (Part II)
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Office Hours: Thursdays, 10-11am via Zoom (Meeting link is posted in Canvas)
Class Meeting Times: Mondays & Wednesdays, 3rd/4th period (9:35 - 11:30)
Room: MAT 114
TA: Ann Atwater (annatwater@ufl.edu)

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 us 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.

- We 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 on the due date; late problem sets will not be accepted for partial credit.

- 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 us 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 20).

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.

Prerequisites

In order to take this course you need to either have completed both *Principles* courses (ECO 2013 and ECO 2023) as well as *Intermediate Microeconomics* (ECO 3101). Alternatively, having taken *Calculus I* (MAC 2233) and *Managerial Economics* (ECP 3704) will allow you to take this course. In general, this course will not shy away from introducing and using a wide range of mathematical tools (multivariate calculus, matrix algebra, etc.). We therefore do not recommend this course to students who are uncomfortable with math or those who struggled with the math in ECO 3101. Please contact us if you are interested in taking this course but are unsure if you have the appropriate background.

Course Material and Textbook

The course largely follows the book:

"Fundamental Methods of Mathematical Economics", 4th Edition, by Alpha Chiang and Kevin Wainwright

All additional course material (for example homeworks, solutions, and grades) will be posted on Canvas (elearning.ufl.edu).

Exams, Homework, and Grading

The final grade will consist of four parts: Exams, homeworks, participation and a final paper. There will be 2 exams, which together account for 60 % of your final grade. The first exam takes place on Feb 28 and the second one on April 20. All exams will be taken in class. If you cannot attend one of the exams, or if you need special accommodation, please let us know as early as possible.

There will also be 9 homeworks during the semester which account for 15% of your final grade. Feel free to work in groups, but each one of you has to submit an individual solution. Homework solutions will be posted on Canvas after they are due.

Problem Sets and Participation	15 %
Exam 1	30 %
Exam 2	30 %
Final Paper	25 %
Total	100 %

If you have questions about the material or homeworks, feel free to attend office hours or send an email to us or the TA. Regarding homeworks, please contact primarily the TA, as she will also be the one grading those. If you need to talk to us outside of office hours, please request a meeting via email.

Grading will be according to the scheme below. Curse grades will not be curved or rounded. For example, a grade of 92.499999% is an A-.

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

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. We highly recommend taking thorough notes when the solutions are presented in class.
- We 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 we examined the effect of an income increase on a consumerÂ'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 us beforehand. Moreover, failure to notify us - 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.

UF Attendance Policy: 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 us 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'Â'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

We encourage you to fill out the online course evaluation form that is available at http://ufl.bluera.com/ufl/. We will provide class time Â–during which we will leave the room Â– 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.

Recording

Please be aware of UF's Recording policy: Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited."

Tentative Course Schedule

#	Date	Topic
1	W, Jan 5	Syllabus
2	M, Jan 10	Equilibrium Analysis in Economics
		- Chiang and Wainwright, Chapter 3
3	W, Jan 12	Equilibrium Analysis in Economics
		- Chiang and Wainwright, Chapter 3
		- **Problem Set I due at the beginning of class**
-	M, Jan 17	No Class (Holiday)
4	W, Jan 19	Linear Models and Matrix Algebra
		- Chiang and Wainwright, Chapter 4
5	M, Jan 24	Linear Models and Matrix Algebra
		- Chiang and Wainwright, Chapter 4
6	W, Jan 26	More of Linear Models and Matrix Algebra
		- Chiang and Wainwright, Chapter 5
		- **Problem Set II due at the beginning of class**
7	M, Jan 31	More of Linear Models and Matrix Algebra
		- Chiang and Wainwright, Chapter 5
8	W, Feb 2	Concept of Derivative and Rules of Differentiation
		- Chiang and Wainwright, Chapter 7
		- **Problem Set III due at the beginning of class**
9	M, Feb 7	Comparative Static Analysis of General-Function Models
		- Chiang and Wainwright, Chapter 8
10	W, Feb 9	Comparative Static Analysis of General-Function Models
		- Chiang and Wainwright, Chapter 8
11	M, Feb 14	Unconstrained Univariate Optimization
		- Chiang and Wainwright, Chapter 9
		- **Problem Set IV due at the beginning of class**
12	W, Feb 16	Exponential and Logarithmic Functions
		- Chiang and Wainwright, Chapter 10
13	M, Feb 21	Exponential and Logarithmic Functions
		- Chiang and Wainwright, Chapter 10
		- **Problem Set V due at the beginning of class**
-	W, Feb 23	Exam Review
-	M, Feb 28	**Exam 1**

14	W, Mar 2	No Class
15	M, Mar 14	Unconstrained Multivariate Optimization
		- Chiang and Wainwright, Chapter 11
16	W, Mar 16	Multivariate Optimization with Equality Constraints
		- Chiang and Wainwright, Chapter 12
		- **Problem Set VI due at the beginning of class**
17	M, Mar 21	Multivariate Optimization with Equality Constraints
		- Chiang and Wainwright, Chapter 12
18	W, Mar 23	Multivariate Optimization with Inequality Constraints
		- Chiang and Wainwright, Chapter 13
		- **Problem Set VII due at the beginning of class**
19	M, Mar 28	Multivariate Optimization with Inequality Constraints
		- Chiang and Wainwright, Chapter 13
20	W, Mar 30	Multivariate Optimization with Inequality Constraints
		- Chiang and Wainwright, Chapter 13
21	M, Apr 4	Multivariate Optimization with Inequality Constraints
		- Chiang and Wainwright, Chapter 13
22	W, Apr 6	First-Order Differential Equations
		- Chiang and Wainwright, Chapter 15
		- **Problem Set VIII due at the beginning of class**
23	M, Apr 11	First-Order Differential Equations
		- Chiang and Wainwright, Chapter 16
-	W, Apr 13	Group Oral Presentations
		- **Problem Set IX due at the beginning of class**
-	M, Apr 18	Group Oral Presentations
-	W, Apr 20	Exam 2
		- **Final Paper due**