

**ECON 4100-001**  
**MATHEMATICAL ECONOMICS**  
**TR 8:30 – 9:45 am**  
**FALL 2019**  
**Friday Room #122**

INSTRUCTOR: Dr. Hui-Kuan Tseng  
OFFICE: 227A, Friday Building  
OFFICE HOURS: MW 2:00 – 3:00 pm and TR 11:30 am – 12:30 pm  
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Teaching Assistant: to be announced

**Required Text:** A.C. Chiang & K. Wainwright, Fundamental Methods of Mathematical Economics, 4th edition, McGraw Hill.

**Electronic Distribution of Class Material:** There is a Canvas page for this course. Syllabus, lecture outlines and other materials will be posted on Canvas. The pace of my lectures will be based on the assumption that you have read the outlines before you come to class.

**Course Description:** ECON4100. Mathematical Economics. (3) Prerequisites: ECON 2101 and 2102 and MATH 1120 or 1241. Both microeconomic and macroeconomic problems are analyzed with quantitative techniques. Emphasis is given to the study of methods for mathematically formulating economic relationships including the tools used for finding maximums, minimums, and limits to single, recursive, and simultaneous economic relationships. Not available for credit in the M.S. program in Economics.(Alternative years)

**Course Objectives:** The objective of this course is to help students acquire the mathematical skills used in the three major types of economic analysis: equilibrium analysis, comparative statics and optimization problems. These include calculus, matrix algebra, multivariable optimization, etc. Such tools are useful not only in microeconomic and macroeconomic theories, but also in many branches of applied economics, including public finance, industrial organization, international trade, etc.

**Course Policies**

**Grading:**

TEST I	100 points
TEST II	100 points
FINAL EXAM (non-cumulative)	100 points
<u>ATTENDANCE</u>	<u>20 points</u>
	320 points

## Notes:

1. There will be two 100-point tests during the semester plus a 100-point non-cumulative final exam, totaling 300 points.
2. No make-up tests shall be given for whatever reason. Students who miss one test are required to take a cumulative final exam which carries a weight of 200 points. Students who miss two tests will get an "F" as course grade.
3. The final exam, regular or cumulative, will be given according to the university's final exam schedule. There will be no consideration given to students who wish to take the final exam early.
4. **Attendance:** Students are expected to attend, to arrive on time and to stay the entire class period. Attendance will be taken 20 times during the semester. Each attendance counts 1 point of your total course points. You are permitted *one absence* from class without the penalty over the course of the semester. If you miss a class for any reason, you are expected to obtain class notes or assignments from other students in the class. In other words, your primary source of information is the classroom – if something is announced in class I am under no obligation to also post that information online or notify the class via e-mail. Please do NOT e-mail me to say, "I cut your class today - what did I miss?" I won't respond.
5. **Bonus Opportunities:** There are extra credit opportunities. You may earn extra credits from in-class practice questions. Ten percent (10%) of the total points you earn on the practice questions counts as your extra credit. When the extra credits are offered, they must be completed in class and only students who are present are eligible for the extra credits. No make-up for in-class practice questions.
6. The combined scores for tests and non-cumulative or cumulative final exams shall be 300 points. The course grade is determined by the following formula and scale:

$$\text{Average}(\%) = \frac{\text{Test1} + \text{Test2} + \text{FinalExam} + \text{Attendance} + 10\% \text{ practice}}{320}$$

A = 90% or above

B = 80% - 89.9%

C = 70% - 79.9%

D = 60% - 69.9%

F = below 60%

**Cells phones and other technology:** The use of cell phones, beepers, or other communication devices is disruptive, and is therefore not permitted during class. If you have a personal or professional emergency or urgent matter, let the instructor know that you may need to respond to a call during class; turn your cell phone to the "vibrate" option, and leave the room to respond to the call. Otherwise, cell phones and other communication devices should be turned off. I also ask that students do not "surf" the internet, text-message or twitter during class; if you have a personal emergency let me know; you can leave the room to respond to a call or text-message. One more thing, you may not use the calculator features of your cell phone during exams.

**Academic Integrity:** Students have the responsibility to know and observe the requirements of The UNC Charlotte Code of Student Academic Integrity. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. Any special requirements or permission regarding academic integrity in this course will be stated by the instructor and are binding on the students. Academic evaluations in this course include a judgment that the student's work is free from academic dishonesty of any type; and grades in this course therefore should be and will be adversely affected by academic dishonesty. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to F. Copies of the code can be obtained from the Dean of Students Office. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty to the course instructor.

**TENTATIVE READING ASSIGNMENT:**

I. INTRODUCTION	CHAPTER
The Nature of Mathematical Economics	1 (pp.2-4)
Economic Models	2 (pp.5-28)
II. EQUILIBRIUM ANALYSIS	
Equilibrium Analysis in Economics	3 (pp.30-47)
Linear Models and Matrix Algebra	4 (pp.48-78)
<b>Thursday, 9/19</b>	<b>***** Test 1 *****</b>
Linear Models and Matrix Algebra (Continued)	5 (pp.82-112)
III. COMPARATIVE –STATIC ANALYSIS	
Comparative Statics and the Concept of Derivative	6 (pp.124-147)
Rules of Differentiation and Their Use in Comparative Statics	7 (pp.148-177)
<b>Thursday, 10/31</b>	<b>***** Test 2 *****</b>
Comparative-Static Analysis of General-Function Models	8 (pp.178-205)
IV. OPTIMIZATION PROBLEMS	
Optimization: A Special Variety of Equilibrium Analysis	9 (pp.220-254)
Optimization with Equality Constraints	12 (pp.347-352)

**Tuesday, 12/10, 8:00 -10:30 am**

**\*\*\*\*\* Final Exam \*\*\*\*\***

*The Belk College of Business strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.*

*UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability Services early in the semester. For more information on accommodations, contact the Office of Disability Services at [704-687-0040](tel:704-687-0040) or visit their office in Fretwell 230*