ECG765 Mathematical Methods for Economics

Syllabus

North Carolina State University
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TA: Doctoral Student Ariel Hsu (dhsu2@ncsu.edu)
Semester: Spring 2024
Time: Tuesdays and Thursdays 11:45AM - 1:00PM, 08/19/2024 - 12/03/2024
Place: 106 Scott Hall
Office Hours: By appointment @ 4104 Nelson Hall or Zoom
Course Website: Link at `https://wphan.wordpress.ncsu.edu/367-2/`
Prerequisites: MA231

Outline

This is a graduate level course in economics. We will examine topics (and their economic applications) including finite-dimensional optimization, difference equations, fixed point theorems, and/or dynamic programming. The goal of this course is to prepare you for the mathematically demanding Ph.D. core courses in economics.

I may occasionally update the syllabus, so please check back for new versions.

Materials

We will follow topics in the (preliminary) order:

- Main text: Simon and Blume, Mathematics for Economists

- de La Fuente, Mathematical Methods and Models for Economists

- Border, Fixed Point Theorems with Applications to Economics and Game Theory

- Rubinstein, Lecture Notes in Microeconomic Theory

- Sundaram, A First Course in Optimization Theory

- Rudin, Principles of Mathematical Analysis

Course Schedule

1. Some Mathematical Logic, Sets, Real Numbers, Relations, Functions

2. Static Optimization

3. Linear Algebra

4. Fixed Point Theorems & Applications

5. Dynamic Optimization

Assessment

5 Assignments: 15% each, lowest score 5%
Two Exams: 20% on higher score, 15% on lower score
Course will be graded on a curve.

Academic Integrity and Honesty

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct (NCSU POL 11.35.01). When you turn in any homework, exam, or group project, you are committing to the Pack Pledge, "I have neither given nor received unauthorized aid on this test or assignment.'

Please refer to the Academic Integrity web page for a detailed explanation of the University's policies on academic integrity and some of the common understandings related to those policies. Violations of academic integrity will be handled in accordance with the Student Discipline Procedures (NCSU REG 11.35.02).

Students with Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resource Office at Holmes Hall, Suite 304, 2751 Cates Avenue, Campus Box 7509, 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (NCSU REG 02.20.01).

Student Identity

In an effort to affirm and respect the identities of transgender students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than what is listed in the student directory.

Personal Safety Requirements Related to COVID-19

Due to the COVID-19 pandemic, public health measures continue to be implemented across campus. Students should stay current with these practices and expectations through the Protect the Pack website. The sections below provide expectations and conduct related to COVID-19 issues.

Health and Participation in Class

We are most concerned about your health and the health of your classmates and instructors/TAs.

- If you test positive for COVID-19, or are told by a healthcare provider that you are presumed positive for the virus, please work with your instructor on health accommodations and follow other university guidelines, including self-reporting.

- If you are in quarantine, have been notified that you may have been exposed to COVID-19, or have a personal or family situation related to COVID-19 that prevents you from attending this course in person (or synchronously), please connect with your instructor to discuss the situation and make alternative plans, as necessary.

- If you need to make a request for an academic consideration related to COVID-19, such as a discussion about possible options for remote learning, please talk with your advisor for the appropriate process to make a COVID-19 request.

Health and Well-Being Resources

Everyone is encouraged to take care of themselves and their peers. If you need additional support, there are many resources on campus to help you:

- NCSU Counseling Center

- Student Health Services

- If the personal behavior of a classmate concerns or worries you, either for the classmate's well-being or yours, we encourage you to report this behavior to the NC State CARES team: Share a Concern.

- If you or someone you know are experiencing food, housing or financial insecurity, please see the Pack Essentials Program.

Community Standards related to COVID-19

We are all responsible for protecting ourselves and our community. Please see the community standards and Rule 04.21.01 regarding Personal Safety Requirements Related to COVID-19.

Course Expectations Related to COVID-19:

- **Face Coverings:** All members of the NC State academic community are expected to follow all university policies and guidelines, including the Personal Safety Rule and community standards, for the use of face coverings.

- **Course Attendance:** NC State attendance policies can be found at: REG 02.20.03 — Attendance Regulations — Policies, Regulations & Rules. Please refer to the course's attendance, absence, and deadline policies for additional details. If you become ill with COVID-19, you should follow the steps outlined in the health and participation section above.

- **Technology Support:** This course may require particular technologies to access materials. See also here for more information. If you need access to additional technological support, please contact the Libraries' Technology Lending Service.

Need Help?

If you find yourself in a place where you need help, academically or otherwise, please review these Step-by-Step Help Topics.

Other Important Resources

- **Protect the Pack FAQs**

- **NC State Protect the Pack Resources for Students**

- **Academic Success Center:** Tutoring, drop in advising, career and wellness advising.

- **NC State Keep Learning:** Also includes tips for students opting to take courses remotely.

- **Introduction to Zoom for students**

- **Learning with Moodle:** A student's guide to using Moodle.

- **NC State Libraries Technology Lending Program**

Additional Information

Students are responsible for reviewing the NC State University Policies, Rules, and Regulations (PRRs) which pertain to their course rights and responsibilities, including those referenced both below and above in this syllabus:

- Equal Opportunity and Non-Discrimination Policy Statement with additional references here.

- Code of Student Conduct