

ECONOMICS 421 (WINTER 2022)

TAO CHEN

COURSE DESCRIPTION

Economics 421 is the first course in a three course sequence representing the core of econometric theory and methodology required of advanced undergraduate students in the economics department. The objective of this course is to familiarize students with econometric models and techniques that are widely used in modern empirical research. The overall grade will be based on several homework problem sets, two midterms and a term project.

TEXT

The recommended textbook for this course is *Introduction to Econometrics* by James Stock and Mark Watson (updated version of the 3rd Edition, Pearson) and *Microeconometrics Methods and Applications* by Colin Cameron and Pravin Trivedi (Cambridge). We plan to cover the following topics:

- I. Basic asymptotic theory and the idea of conditioning (2 weeks)
- II. Ordinary least squares with one regressor: estimation and hypothesis tests (2 weeks)
- III. Ordinary least squares with multiple regressors: heteroskedasticity (2 weeks)
- IV. Instrumental variables and Two stage least squares (1.5 weeks)
- V. Nonlinear least squares and Method of moments (1 week)
- VI. Maximum likelihood estimation (1 week)
- VII. Limit dependent variable models (2 weeks)
- VIII. An introduction to the concepts of Machine learning and Deep learning (0.5 week)

GRADING

The overall grade will be based on several homework problem sets (20%), two midterms (30% each), and a term project (20%). There will be no makeup for the midterms. If you miss one midterm, the project will count 50% of the course grade. You have to take at least one midterm. No late homeworks will be accepted. I will deny all requests for a makeup unless the circumstances happen to be really extraordinary.

CLASS TIME

Monday and Wednesday 16:00 – 17:20 in HH 1106.

EXAMS

First midterm: Feb. 27; Second midterm: TBA.

CONTACT INFORMATION

- Room: 207 HH
- Phone: 519-888-4567 ext. 32558
- Email: t66chen@uwaterloo.ca
- Office hours: Wednesday 14:45–15:45 or by appointment

ACADEMIC INTEGRITY, GRIEVANCE, DISCIPLINE, APPEALS AND NOTE FOR STUDENTS WITH DISABILITIES

See www.uwaterloo.ca/accountability/documents/courseoutlinestmts.pdf. The text for this web site is listed below:

- Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check www.uwaterloo.ca/academicintegrity/ for more information.]
- Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.
- Discipline: A student is expected to know what constitutes academic integrity [check www.uwaterloo.ca/academicintegrity/] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties check Guidelines for the Assessment of Penalties, www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.
- Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.
- Note for Students with Disabilities: The Office for persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.
- Turnitin.com: Plagiarism detection software (Turnitin) will be used to screen assignments in this course. This is being done to verify that use of all material and sources in assignments is documented. In the first week of the term, details will be provided about the arrangements for the use of Turnitin in this course. Note: students must be given a reasonable option if they do not want to have their assignment screened by Turnitin. See: <http://www.uwaterloo.ca/academicintegrity/Turnitin/index.html> for more information.