E-mail: zusai@temple.edu  Allow me to share your questions and my replies with your classmates through Blackboard, while I will hide your name. Send an e-mail from your temple address, don’t miss your name on the text, and add a proper subject line with the course number 8003. Otherwise, your e-mail will not be read. Any administrative/grading issues should be discussed by e-mail, not orally. No oral conversation can be binding.

Website: I will post materials and announcements on Temple Blackboard. You should subscribe the daily notification of BB. All the notices such as change in the HW due date, cancellation of the office hours will be announced only on the blackboard; an e-mail notice will be made only in an emergent situation, such as an emergent cancellation of a lecture. Handouts given in a lecture will be neither posted on the BB nor given in a later lecture, partly as a penalty for absence. So you need to attend every lecture.

Office hours: M 4:15–5:15 pm, Tu & Th 11 am–noon at Ritter Annex 881. Please come early enough before the closing time, as I may have another class or appointment and thus needs to end strictly at this time. I encourage you to come with your study mates so to share questions.

About this course

Purpose and learning goals
In any fields of modern economics, mathematics has been used not only for numerical computation but more essentially as the language to convey ideas with solid logic. Abstraction of mathematical models leads economists to extract the critical essence of economic problems for general insights. Rigor of mathematical logic allows economists to easily capture a crystal clear image of assumptions, implications and limitations behind economic arguments. Abstraction and rigor are what economics stands out as the king of modern social sciences. Anyone who wants to understand truly academic, front-end research in economics needs literacy of abstract and formal mathematics, beyond quantitative calculation.

Through learning basic mathematical techniques with delicate attentions to every logical step and formal writing, a student in this course will acquire literacy to read academic writings in economics as well as skills to apply these techniques to formal models in economic theory. For this purpose, we put emphasis on accuracy of logic and formality of writing rather than mechanical calculation.

All the students in our econ graduate program are assumed to have mastered college mathematics and thus to have acquired basic calculation techniques. Therefore, they should not feel too many new things in calculation and are supposed to focus on rigorous and deep understanding and formal and logical writing. These are important skills for writing the dissertation and academic papers even in applied theory or empirical research.

Prerequisites
There is no official prerequisite for this course, only because this course is one of the first courses that you take at Temple. But you should have completed all the math and econ courses that are suggested in the admission policy of our graduate program, and indeed mastered the contents.

In particular, students in this course should be pretty confident in math, especially calculus and linear algebra at college level, feel comfortable with heavy use of mathematical notation and logic, and have basic knowledge in microeconomic theory at college intermediate level. To let you well prepared for this course (and graduate study in general), I gave you preliminary homework during the summer break. As a serious student, you should have done it and completely finished necessary review during the break.

Materials
The lecture slides and notes will be posted on Blackboard in advance. Download and bring them to the lecture. It may be required to read some part of the lecture notes before coming to the class and there may be a quiz (in class or on BB) to check it. The lecture note is the primary source of definitions, theorems, etc. As the secondary references and the problem sets, you are required to obtain a copy of Simon and Blume, Mathematics for Economists (Norton). On some topics, chapters from other books may be referred; those will be available from ARES course reserve on Blackboard. PhD students are supposed to read all the notes and materials for the qualifying exams, even if some of them are told to be optimal for this course. When there is any discrepancy between the lecture notes and other reading materials including the textbook, we follow the lecture notes. If not sure, always ask the instructor.

Grading

Exams
There will be one midterm exam and one final exam. Makeup for the midterm or the final may be allowed only if you submit a formal and written evidence of a legitimate reason in a timely manner; if you expect anything that prevents you from taking the exam, you should discuss the issue with me by e-mail no later than two weeks before the exam. You must check and follow the detailed policy on Blackboard. Otherwise, you will earn zero for the score of the exam that you miss. If you need accommodation because of any learning disability, you must

---

1 For the entire campus closure due to weather etc., you should be notified from the university and thus I will not send an e-mail.
obtain the authorization letter for test accommodation from Disability Resources and Services of the university and show me the letter by two weeks before the exam. You should tell the need to me and work with DRS immediately, say within the first two weeks of the semester, because the verification process takes much time.

Homework
Writing clean mathematical argument is an essential skill in economics. But it is hard to evaluate it within short time of the exams. The purpose of the HW is to complement the exams for evaluation and feedback on your mathematical writing skills.

The homework will be normally given, collected and returned through the Blackboard system. The scan of handwriting is accepted only if it is neat enough for the instructor; you should write in print, not in cursive. If you cannot fix bad handwriting, you should type your HW. (Use MS Word or LaTeX.) You have to follow all the instructions on the HW. Any violation will be severely penalized or even not accepted without chance of resubmission or any feedback.

You must submit the homework by the deadline to get the full credits. No late submission will be accepted. If you expect something to prevent you from submitting the homework on time, you have to contact me in advance. There will be no make-up homework for any reasons.

Homework will be kept to be minimum to evaluate your writing skills. Besides, though basically one HW problem is given for each topic, HW will be collected only after ending each of Parts 1–3 to give you flexibility in schedule. You must do exercises voluntarily to master the contents of the course. I write exercise problems or pick some from the textbook. You are supposed to try all those suggested exercises after each lecture and keep all your works for this course until receiving the letter grade, in case that the instructor asks you to show how you study for this course.

I strongly encourage you to form a study group with your classmates. But never copy their answers; you have to restrict yourself only to share the ideas. You need to write the answers by yourself. If you refer any materials including published solutions, you must cite the sources. Plagiarism will be severely punished according to the university policy. (You should read the policies below seriously.)

Grading formula
The overall score $OS$ is defined by the following formula

$$OS = 0.7E + 0.3H,$$

where the aggregate exam score $E$ and the aggregate homework score $H$ are determined from the midterm score $M$, the final exam score $F$ and the $i$-th homework score $Hi$ ($i \in \{1,2,3\}$) by

$$E = \begin{cases} 0.5M + 0.5F & \text{if } M \geq F; \\ 0.3M + 0.7F & \text{if } M < F; \end{cases}$$

$$H = \frac{1}{3} \sum_{i=1}^{3} H_i.$$

There may be various opportunities to earn bonus points; but each may follow a different rule to be added to $OS$. Even if the maximum points of an exam or a HW assignment exceed 100, there will be no adjustment (for example, like counting only percentage) when applying the above formula, unless otherwise told.

Disability Statement: This course is open to all students who meet the academic requirements for participation. Any student who has a need for accommodation based on the impact of a disability should contact the instructor privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.

Statement on Academic Freedom: Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed through the following link: http://policies.temple.edu/getdoc.asp?policy_no=03.70.02.

Policy on Religious Holidays: If you will be observing any religious holidays this semester which will prevent you from attending a regularly scheduled class or interfere with fulfilling any course requirement, your instructor will offer you an opportunity to make up the class or course requirement if you make arrangements by informing your instructor of the dates of your religious holidays within two weeks of the beginning of the semester (or three days before any holidays which fall within the first two weeks of class).

Policy on Academic Honesty: Temple University believes strongly in academic honesty and integrity. Plagiarism and academic cheating are, therefore, prohibited. Essential to intellectual growth is the development of independent thought and a respect for the thoughts of others. The prohibition against plagiarism and cheating is intended to foster this independence and respect. Plagiarism is the unacknowledged use of another person’s labor, another person’s ideas, another person’s words, another person’s assistance. Normally, all work done for courses – papers, examinations, homework exercises, laboratory reports, oral presentations – is expected to be the individual effort of the student presenting the work. Any assistance must be reported to the instructor. If the work has entailed consulting other resources – journals, books, or other media – these resources must be cited in a manner appropriate to the course. It is the instructor’s responsibility to indicate the appropriate manner of citation. Everything used from other sources – suggestions for organization of ideas, ideas themselves, or actual language – must be cited. Failure to cite borrowed material constitutes plagiarism. Undocumented use of materials from the World Wide Web is plagiarism.

Academic cheating is, generally, the thwarting or breaking of the general rules of academic work or the specific rules of the individual courses. It includes falsifying data; submitting, without the instructor’s approval, work in one course which was done for another; helping others to plagiarize or cheat from one’s own or another’s work; or actually doing the work of another person.” Students must assume that all graded assignments, quizzes, and tests are to be completed individually. I reserve the right to refer any cases of suspected plagiarism or cheating to University Disciplinary Committee. I also reserve the right to assign a grade of F for the given paper, homework assignments, quiz or test.