

# ECON 491, Advanced Microeconomics

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- **Course Materials on D2L:** I will post class announcements, assignments and other relevant material on the [Desire2Learn](#) network. Students are responsible for staying updated with the material posted on D2L.
- **Textbook:** There is no textbook for this class. I have put together my own notes, which are posted on D2L. If you want additional material, the topics from class are typically covered by standard textbooks on game theory, as well as by collections of lecture notes from teachers in other universities that you can easily find online.
- **Video Lectures:** I will post video lectures on D2L. My lecture notes are what I would have written on the board and talked about if we were able to meet in person. Therefore, because I am giving you direct access to these notes, I will not be recording lectures just to read them back to you on video.

Other than some “big picture” lectures that I will record to introduce some material, **the topics for the video lectures will have to come from you**. One of the discussion boards on D2L is dedicated to this. On this board you can ask me questions, which I will collect and record answers to (at least as many of them as I can). **If you keep your questions until the last minute, say the day before a problem set is due, then it will be impossible for me to record answers to help you in a timely fashion**. As detailed below, I have broken up the material into six two-week blocks, with problem sets due at the end of each block. The ideal process would be for you to read the lecture notes early in each block and get questions to me as soon as possible, so that I can respond in time to help you get through that block.

For the video lectures, you can ask me specific questions about the lecture notes (e.g., “on p.X I do not understand step Y or definition Z”), or broad questions about *why* we are doing

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something (e.g., “what is the theoretical point of concept X, or how would this concept be useful to study social science problem Y?”), or questions about specific exercises in the problem sets.

I usually learn a lot about how students in my class are progressing from the questions and discussions that arise during lectures, and in turn those conversations make the course more responsive to students’ needs and interests. In the absence of face-to-face meetings, I’m hoping that this interactive way of producing video lectures will replicate some of the back-and-forth that makes courses more interesting for all of us.

- **Office Hours:** I will be holding weekly office hours. If I cannot answer some of your questions in video lectures, I may ask you to visit these office hours so that I can address them there. **I will post the day, time, and online platform for these office hours in the first week of class on D2L.** I first want to take a quick poll of all students, to get a sense of which time zones all of you will be spending the term in.
- **Topics:** From the university calendar: This course prepares students for graduate-level theory courses. Students will be exposed to a selection of topics treated with the mathematical rigour required for graduate work.

For my part, I thought it best not to replicate a standard M.A. theory course, but instead to introduce students to important topics that are often dropped because of lack of time in graduate classes, while covering them at a level that approaches the graduate level. Specifically, the course will focus on using the tools of economic theory to study cooperation. In the first part of the class, we will study cooperation in standard (“noncooperative”) games, where we will focus on how introducing communication can expand the set of equilibrium outcomes of these games. In the second part of the class, we will study cooperative games, a different approach to game theory which builds in the possibility for communication and coordination between the players at the outset.

- **Evaluation:** There will be six problem sets and one final project.
  - i. Problem sets are worth 80% of your final grade. Their aim is to help you integrate the material from class by working out specific examples or proving simple results. Teamwork is expected (and indeed recommended if you can make it happen), although each student must hand in their own assignment, written in their own words. Clear evidence of plagiarism will be penalised with lower grades. When grading, I will be looking for evidence of serious thought behind your answers to the questions. Each problem set will ask you to come up with an additional problem set question, along with a solution key, on your own. This will be important for me to see whether or not you are engaging with the material, so please take these sections seriously.

As I detail below, I will divide the term into six two-week blocks, which will run from a Monday to a Friday. **Problem sets are due on the final Friday of a block at 17h00 Eastern Time (i.e., Waterloo time).** Problem sets are to be uploaded to the relevant dropbox in D2L. **All problem sets are to be uploaded as a single pdf file, with pages properly ordered and with the text in the correct direction.** I neither expect nor prefer typewritten answers; handwritten and scanned answers are perfectly fine, as long as you follow the guidance above. Not following that guidance will result in lower grades.

Each problem set is worth 16% of your final grade, and **I will count only your best five out of six problem sets.**

- ii. The final project is worth 20% of the final grade, and **it is due on Monday Dec 14 at 17h00 Eastern Time**, in the relevant dropbox in D2L.

I am flexible about exactly *what* constitutes a final project, and it is your responsibility to come up with your own plan. For example, you could write a report on an academic paper either applying or developing the theoretical tools covered in class. Or you could develop a model with these tools that you think could address a real-world problem you are interested in. Or you could focus on a few key assumptions from the models we cover in class, and discuss/criticise them or suggest models that would relax them. The bottom line is that I will be looking for signs that you have learned something in this class, and that you can *do* something with the material from class beyond solving problem set questions. **Final projects are not expected to be long, a few pages will suffice.** When grading I will value depth, originality and clarity, not length.

**I will need to approve your plan for your final project before Friday Oct 23 at 17h00 Eastern Time.** One of the discussion boards in D2L is dedicated to your proposals for your final project. On that board you can describe your project to me, and when I am satisfied I will approve it with an “up vote”. I chose to make this proposal process public because your ideas about your final project may help your classmates come up with their own.

- **Blocks:** Here are the six two-week blocks into which the material will be divided.
  1. Review of Nash equilibrium, plus existence of equilibrium using fixed point theorems, weeks of Sept 8-11 and 14-18, pages 1-13 in the notes.
  2. Correlated equilibria with public and mediated communication, weeks of Sept 21-25 and Sept 28-Oct 2, pages 13-32 in the notes. This will be a lot of material, but there is enough overlap in the topics in this section so that they fit together well.
  3. The Revelation Principle, weeks of Oct 5-9 and Oct 19-23, pages 32-38 in the notes. NOTE: the week of Oct 12-16 is reading week. This is a lighter block in terms of

material, which can give you a chance to digest some of the previous sections or read ahead to future sections. Also, by the end of this block I need to have agreed to your plan for the final project, so you have a bit more time to think about that.

4. Introduction to cooperative game theory, plus the core (excluding existence of the core), weeks of Oct 26-30 and Nov 2-6, pages 32-50 in the notes.
5. Existence of the core, plus market games, weeks of Nov 9-13 and 16-20, pages 50-62 in the notes.
6. Von Neumann-Morgenstern stable sets, weeks of Nov 23-27 and Nov 30-Dec 4, pages 62-73 in the notes.

- **Policy on Missed/Late Assignments and Tests:** Any late problem sets or final projects will be penalised by 2% per day, unless students provide a valid Waterloo Verification of Illness form.
- **Cross-listed course:** Please note that a cross-listed course will count in all respective averages no matter under which rubric it has been taken. For example, a PHIL/PSCI cross-list will count in a Philosophy major average, even if the course was taken under the Political Science rubric.
- **Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See the [UWaterloo Academic Integrity](#) webpage and the [Arts Academic Integrity](#) webpage for more information.
- **Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 - Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#). For typical penalties check [Guidelines for the Assessment of Penalties](#).
- **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. When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.

- **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](#).
- **Note for students with disabilities:** The [AccessAbility Services \(AS\) Office](#), located on the first floor of the Needles Hall extension (1401), 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 AS office at the beginning of each academic term.