Course description
In many – perhaps most – economic interactions, there is potential for strategic behaviour, a term, “intended to focus on the interdependence of the adversaries’ decisions and on their expectations about each other’s behaviour.” (Schelling, 1960, The Strategy of Conflict). Recognising and understanding such behaviour is an essential part of any economist's toolkit and this course is designed to enable just such recognition and understanding.

Game theory has successfully been applied in a diverse range of fields, such as economics, political science, law, biology and computer science. The aim of this course is to provide an introduction to strategic thinking and analysis through the basic techniques of game theory and to illustrate the range of its applications, primarily in economics and business but also in other areas. While the level of the course will be introductory, and mathematical prerequisites are minimal, the presentation of the material will rely on precise logical arguments.

Lecturer
Prof. Martin Richardson
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I have been at the ANU since 2003. I got my PhD in Economics at Princeton University and have taught at Georgetown University in Washington DC and the University of Otago in New Zealand as well as at the ANU. I have published in international trade and applied micro and have been an academic visitor at the University of Toronto, the Université de Montréal, the University of Copenhagen Business School, University College Dublin and the University of Tübingen, amongst others. I have been a Lay Member of the NZ High Court since 2000.
Mode of instruction
The course runs through Semester 1 2016: February 15\textsuperscript{th} to May 27\textsuperscript{th}. Students are expected to attend all lectures, tutorials and exams throughout this period – do not make alternative commitments that will prevent your attendance at these times. In particular, the mid-semester test is set for Tuesday March 22\textsuperscript{nd} and there is no substitute or supplementary test for it. The primary mode of instruction will be through lectures, augmented by tutorials, readings and web-based problems.

Lectures
All in MCC T4 (Manning Clark Centre)
Tuesdays: 3:00pm-4:00pm
Thursdays: 9:00am-10:00am

Tutorials
All students attend a one hour tutorial starting in the second week. Enrolment in tutorials will be completed online using the CBE Electronic Teaching Assistant (ETA). To enrol, follow these instructions:
1. Go to \url{http://eta.fec.anu.edu.au}.
2. You will see the Student Login page. To log into the system, enter your University ID (your student number) and password (your ISIS password) in the appropriate fields and hit the Login button.
3. Read any news items or announcements.
4. Select "Sign Up!" from the left-hand navigation bar.
5. Select your courses from the list. To select multiple courses, hold down the control key. On PCs, this is the Ctrl key; on Macs, it is the key. Hold this key down while selecting courses with the mouse. Once courses are selected, hit the SUBMIT button.
6. A confirmation of class enrolments will be displayed. In addition, an email confirmation of class enrolments will be sent to your student account.
7. For security purposes, please ensure that you click the LOGOUT link on the confirmation page, or close the browser window when you have finished your selections.
8. If you experience any difficulties, please contact the School Office (see below for contact details).

The first tutorial will take place during the second week of class. Tutorial exercises are designed to apply and reinforce the principles taught in lectures. Foundation tutorial questions for the following week will be available on Wattle (but not the other questions – you must attend the tutorial to get those.) I emphasise that you must attempt the foundation tutorial problems before attending the tutorial in order to make sense of the regular problems that will be discussed in the tutorial. \textbf{N.B. None of the tutorial materials will be made available online.} The final exam questions will be tutorial style problems. You will only learn problem solving skills (necessary to pass the final exam) through practice, NOT by simply writing down the answers given in tutorials. You learn by doing and practicing.
Course evolution

ECON2141 v1.2016 release new features:

- Partially in response to student feedback on earlier iterations, the course this year features lecture recordings and continues with Enhanced In-Class Interactivityness™ 2.1. In response to 2015 student feedback, the 5% assessment for in-class exercises and online questions will be pro-rated according to participation.
- As in 2005, in response to the ANU Minitrue decree of December 2014 extending the cookie-cutter standardisation of ANU education to the ‘depreciation rule’ for late submission, there will be no written assignments in ECON2141 2016. Instead, the structure of tutorial questions will again mimic Best Practice™ at the University of Melbourne: more details in class.

Syllabus

1. What is game theory?
2. Simultaneous move games and pure strategies
3. Simultaneous move games and mixed strategies
4. Nash equilibrium explored
5. Sequential move games
6. Extensive form games, subgame perfection, backward induction
7. Information issues – Bayesian games
8. Repeated games and folk theorems
9. More applications
   a. Strategic commitment
   b. Pricing strategies
   c. The dynamics of pricing rivalry
   d. Entry and exit

Texts

No textbook is formally required but the following would be useful (in this order)

Any more recent editions of these books will do. Students will be supplied with a set of selected readings and copies of (most of) the lecture slides as we proceed.

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1 Note that no warranty, implied or express, is given concerning the coverage of this course and the lecturer issues no undertaking to cover all or any of the following material, so this is tentative only! In particular, the scheduling of topics is subject to on-the-spot revision as the class progresses.
## Contacts

<table>
<thead>
<tr>
<th>Role</th>
<th>Office address</th>
<th>Email</th>
<th>'phone</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Convenor and Lecturer:</strong> Martin Richardson</td>
<td>2013, HW Arndt Bldg.</td>
<td>Martin.Richardson @anu.edu.au</td>
<td>6125-3582</td>
<td>Thurs 1-3, other times by appointment</td>
</tr>
<tr>
<td><strong>Tutor:</strong> TBA</td>
<td>TBA</td>
<td>TBA @anu.edu.au</td>
<td>6125-xxxx</td>
<td>TBA</td>
</tr>
<tr>
<td>Finn Wijnberg, RSE School Administrator</td>
<td>1014, HW Arndt Bldg.</td>
<td>Finola.Wijnberg @anu.edu.au</td>
<td>6125-0195</td>
<td>09:00–17:00</td>
</tr>
<tr>
<td>Karissa Carkeet, RSE Course Administrator</td>
<td>1013, HW Arndt Bldg.</td>
<td>Karissa.Carkeet @anu.edu.au</td>
<td>6125-0195</td>
<td>09:00–17:00</td>
</tr>
</tbody>
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## Assessment

Assessment is based on the final exam, a mid-semester exam and participation in both in-lecture surveys and online questions.

- Final exam 75-90%,
- In-class surveys 5%,
- Online questions 5%,
- Mid-semester test 15% – redeemable against final,

_N.B.: Regardless of these weights, a disastrous failure on the final is grounds for failing the course._

Note that the final and mid-semester are compulsory and failure to do them means you get zero for that component of the assessment. The mid-semester test, however, is redeemable: if you do better on the final than on the mid-semester then your final will count for 90% of your course grade rather than the default 75%.

No supplementary mid-semester examination will be offered. Students who do not attend the mid-semester test will be awarded a mark of zero and their final will be worth 90% of their course grade. Any further details regarding exams will be announced in lectures and posted on Wattle.

**Extensions Policy:** The in-class surveys and online questions must all be answered by **5:00pm Friday** on the week in which they are assigned. No extensions beyond this will be given for these for ANY reason.

**Technology, Software, Equipment**

I plan to use Wattle extensively and as my main means of getting material to you: [https://wattle.anu.edu.au/](https://wattle.anu.edu.au/). Please ensure that you have access and that you check it regularly.

Prior to a number of lectures you will be asked to participate in “on-line experiments” which will help you to focus on games and decision problems which
we will discuss later in class. Once you complete a set, it will be recorded. I will have access to the information about which sets you have completed. There are no “right” and “wrong” answers to the posted problems and each set will take only a few minutes to complete. Please respond to the problems as naturally as possible. I will have the aggregated statistics of the class’ responses and we will use these in class discussion. To get the 5% assessment allocated for this component of the course you must do all of the assigned questions from week two onwards (probably 6 or 7 weeks all up.) You will get somewhere between 0% and 5% in this element, depending on what share of the questions you answer.

In order to participate in these experiments you will first need to register. Please do so immediately, before the first class meets:

- Please log into [http://gametheory.tau.ac.il/student/?c=2591](http://gametheory.tau.ac.il/student/?c=2591). (You’ll need cookies enabled on your browser to log in.)
- Our Course Number is 2591.
- The initial class password is 2951 but you will have to select a new password after login.

Please remember the login name and the personal password you select. (You will be able to retrieve the password if you lost it). After registration you will be automatically directed to the first problem set which I have posted for you. Please respond to all problems. Only after you have completed the set will you receive confirmation (with a red tick) and your participation will be recorded. In case you are interrupted before you finish the set you will be able to login again and resume the set from the point at which you stopped.

Finally, we will be using some in-class surveys run through Google Forms. To participate in these you will need, ideally, some form of internet access while in class: a smartphone, tablet or laptop. If you do not have these you can still participate with pen and paper. You can also do this without coming to class: just log onto the Wattle site before 5pm each Friday (when that week’s questions will disappear) and follow the links to respond. More instructions will be provided in class. The 5% assessment allocated for this component of the course comes from the in-class surveys from week two onwards only – there will be some assigned in week one as practice but they will not count towards the assessment. You will get somewhere between 0% and 5% in this element, depending on what share of the questions you answer in weeks 2-13.

**Learning Outcomes**

In order to satisfy the requirements of this course, students will need to acquire a thorough understanding of the concepts introduced during the semester, and will need to demonstrate that they can apply the corresponding tools and ideas to unfamiliar problems. Note that just memorising the steps used to solve examples discussed in lectures and assigned tutorial problems will not lead to a clear understanding of these concepts, and will not prepare students to tackle the problems they will be required to solve in the exams.
On satisfying the requirements for this course, students should have the knowledge and skills to:

- Understand how game theorists think and approach a strategic problem.
- Understand the tools taught in class and be able to recognise their application to the analysis of real world fact situations.
- Recognise the strategic issues in a problem and understand how a game theorist might decide on the appropriate tools to analyse it.

**Workload**

Students taking this course are expected to commit at least 10 hours a week to completing the work, comprising:

- 2 hours a week of lectures
- 1 hour a week of tutorial
- 7+ hours a week: reading, writing and tutorial preparation

**Scaling**

Your final mark for the course will be based on the **raw** marks allocated for each assignment or examination. However, your final mark may not be the same number as produced by that formula, as marks may be **scaled**. Any scaling applied will preserve the rank order of raw marks (i.e. if your raw mark exceeds that of another student, then your scaled mark will exceed the scaled mark of that student), and may be either up or down.

**Research-Led Teaching**

The lecturer is a user of game theory in his own research, albeit as a tool of analysis rather than the subject of the analysis itself. Consequently, students will be exposed to the practical use of game theory and strategic thinking in current economics research – explicitly in one of the applications covered in s.9 of the course.

**Feedback**

It is hoped that the lectures will involve a lot of discussion, questions and answers. We will provide a verbal review of each tutorial exercise and review of the mid-semester exam (in tutorial time) and thus feedback to the class as a whole. All online and in-class questions will be discussed directly in class.

ANU regularly seeks feedback from students. One of the key formal ways students have to provide feedback is through Student Experience of Learning Support (SELS) surveys. The feedback given in these surveys is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching, and opportunities for improvement. It is also expected that students will complete these surveys as a matter of Best Practice™. For more information on student surveys at ANU and reports on the feedback provided on ANU courses, go to:

http://unistats.anu.edu.au/surveys/selt/students/ and

General Information for all Students

CBE Student Office
http://www.cbe.anu.edu.au/

The CBE Student Office provides assistance with program and course selection, enrolment, change of program, variation to enrolment, status and other general matters. It is located on Level 2 of CBE Building 26c, contact details:

- T: (61) 02 6125 3807
- E: info.cbe@anu.edu.au

Main Administrative Dates
http://timetable.anu.edu.au/

The main administrative dates regarding teaching sessions, course census dates, examination period, graduation and enrolment variations (i.e. add and drop courses) are available from the ANU Timetable.

ANU Student Support

Academic Skills and Learning Centre
https://academicskills.anu.edu.au/

The Academic Skills and Learning Centre, in the Pauline Griffin Building, offers services to students regarding a range of academic issues including essay writing, note-taking, referencing, reading, examination preparation, and plagiarism.

ANU College

ANU College offers the following introductory and extended programs:
- maths bridging courses; and
- English language support for students from non-English-speaking backgrounds.

Information Literacy Program
http://anulib.anu.edu.au/training/

Workshops are available to undergraduate and graduate students to develop skills in handling information and communication technologies.

Policies, Procedures and Rules

ANU Students
http://students.anu.edu.au/

The Students pages on the ANU Website provide links to most of the information you need to know on matters such as enrolment and administrative procedures. See also Study@ANU (https://studyat.anu.edu.au/) and the ANU Rules and Policies (http://about.anu.edu.au/governance-structure/legislation/rules and https://policies.anu.edu.au/ppl/document_list/index.htm?audience_id=Students).

Information for Enrolled Students

Students are expected to be familiar with the ANU College of Business & Economics and university-wide policies and procedures on the following:
- Code of Practice for Student Academic Honesty
Special Examinations


You must contact the College Office for guidance on the procedure for special examinations for final examination. Do not approach your lecturer for this information.

Special examinations are not automatically granted. If approved, successful candidates are required to contact the relevant School Office to obtain details of the special exam. If you do not sit the examination, or your application for a special examination is declined, then you will fail the course as incomplete.

It is not grounds for a further special examination if students are not contactable and miss the scheduled examination date.

Special Consideration


If illness or other disruptive events have affected your preparation for, or performance during, an examination, you can bring this to the attention of the examiners by making a request for special consideration using the Application for Special Consideration form.

Special Arrangements

If you have a disability or disorder (permanent or temporary) which makes undertaking a formal sit-down examination difficult, then you are responsible for requesting special arrangements to be made for your examination. In the past these arrangements have included the use of special equipment, additional time, writing breaks, a scribe (someone to write for you), etc.

Please contact the Examinations and Graduations Office early in the semester and at least 10 days prior to the examination period. Failure to make appropriate arrangements for an examination may result in a subsequent application for a special examination/special consideration being declined.

Disabilities

If you have an ongoing medical condition you are advised to register with the Disability Services Centre. The ANU Disability Services Centre’s website is at http://disability.anu.edu.au/.
Supplementary Examinations
In accordance with the University Examinations Rules 2009 (No. 3), you may be provided with a supplementary examination. If you have qualified for a supplementary examination, your grade will be recorded as a PX on your Notification of Results. You must notify the School Office, in writing (email is satisfactory), within 7 days of the official publication date of examination results to indicate your acceptance or otherwise to sit the supplementary examination.

If you pass the supplementary examination you will receive the grade of PS (pass at supplementary examination) and a mark of 50. If you are unsuccessful, or you decide not to sit the supplementary examination, your grade will be recorded as N (fail) and your original mark will stand.

Supplementary examinations will be held early in the next semester on dates to be advised. For information regarding the timing and venues for supplementary examinations please refer to the school website in week 2 of the current semester: http://rse.anu.edu.au/.

Travel plans should be made accordingly as travel plans are not an acceptable reason to miss a supplementary examination.

Results and Examinations
In accordance with the University Assessment Grades/Codes, CBE applies the following scale when awarding grades:

**Final Pass Grades**
- HD – High Distinction 80–100
- D – Distinction 70–79
- CR – Credit 60–69
- P – Pass 50–59
- PS – Pass at supplementary examination 50

**Final Fail Grades**
- N – Fail 00–49
- NCN – Not Completed/Fail
- WN – Withdrewn with failure

**Interim Codes** (used when a result for a course has not yet been finalised)
- DA – Deferred assessment
- PX – Offered supplementary assessment
- RP – Result pending
- WA – Withheld for administrative reasons

**Results Notification**
To access results students should check their ISIS accounts on the advertised date for release of examination results. After publication, students enquiring about results must provide an ANU student card as proof of identification to the Examinations, Graduations, Prizes and Timetabling Office (Building 12). For privacy reasons students should not make enquiries regarding the results of other students.
Examination Timetable – Final Examination Period
http://timetable.anu.edu.au/
Details of the final examination timetable are available on the ANU Timetabling website. The onus is upon students to acquire their own scheduling details.

Examination Timetable – Mid-Semester Examinations
When a mid-semester exam is scheduled, timetable information will be posted by the relevant School.

Misconduct
We’re against it. See http://about.anu.edu.au/__documents/rules/disciplinerules.pdf
In relation to an examination, misconduct on the part of a student includes:

- cheating;
- plagiarism (including the reproducing in, or submitting for assessment for, any examination, by way of copying, paraphrasing or summarising, without acknowledgement and with the intention to deceive, any work of another person as the student’s own work, with or without the knowledge or consent of that other person);
- submitting for an examination any work previously submitted for examination (except with the approval of the prescribed authority);
- failing to comply with the University’s instructions to students at, or in relation to, an examination;
- acting, or assisting another person to act dishonestly, in or in connection with an examination; and/or
- taking a prohibited document into an examination venue.

The administrative procedures regarding misconduct are incorporated in the ANU Discipline Rules.

Plagiarism
We’re against this, too. See http://cbe.anu.edu.au/cbe/current-students/undergraduate-graduate-coursework/examinations-and-assessment/plagiarism-academic-misconduct/
The College regards plagiarism as any appropriation of the ideas or expressions of another without relevant and appropriate acknowledgment. This includes un-attributed appropriation of text or content and may extend to improper referencing. Plagiarism will not be tolerated in any course and all discovered instances would be pursued to the full extent allowable under the rules. Where students have doubts as to how to deal with or acknowledge source materials in course assignments they should consult the lecturer or tutor. The penalties and administrative procedures regarding plagiarism are incorporated in the ANU Policy on Academic Honesty. On-line material discussing plagiarism and referencing styles is available from the Academic Skills and Learning Centre Web page (https://academicskills.anu.edu.au/).