UNSW Course Outline

ECON2112 Game Theory and Business Strategy - 2024

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General Course Information

Course Code : ECON2112
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : UNSW Business School
Academic Unit : School of Economics
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Game theory is a structured way to think about strategic interactions and it is fundamental to the understanding of modern business strategy. In this course, you will be introduced to the basic tools of Game Theory and its applications to business choices. We will cover normal form and

extensive form games, games of perfect and imperfect/incomplete information, and will introduce equilibrium concepts such as Nash Equilibrium, Subgame-Perfect Equilibrium and Perfect Bayesian Equilibrium. We will also look at repeated games and the theory of reputation. Game Theory will not only equip you with an understanding of the basic principles of strategic analysis but also empower you to integrate ethical and sustainable considerations into the application of abstract theory to specific real-world business challenges.

Course Aims

ECON2112 is offered as part of the economics stream in the BCom and BEc degrees. Prerequisites for this course are ECON1101 Microeconomics 1 (or COMM1100) and ECON1202 Quantitative Analysis for Business and Economics. This course aims to build on basic theories and knowledge learnt in these prior courses. The knowledge acquired in this course is further developed and used in third-year courses including ECON3121 Managerial Economics and ECON3123 Organisational Economics among others. The course is useful for students in Mathematics & Statistics, Computer Science and Engineering, especially those who are interested in Data Science.

Course Learning Outcomes

Course Learning Outcomes	Program learning outcomes
CLO1 : Apply abstract theory to concrete problems demonstrating an understanding of the basic principles of strategic analysis including solution concepts.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development
CLO2 : Compute pure and mixed strategy Nash equilibria in normal form games.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication
CLO3 : Solve perfect information games using backwards induction.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO4 : Compute pure and mixed subgame perfect equilibria in extensive form games.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO5 : Analyse problems and formulate strategic solutions with a focus on ethical and sustainable outcomes, utilising tools provided by the course materials.	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development
CLO6 : Develop succinct and clear work that reflects ethical and sustainable principles, to communicate ideas presented in a logical, professional and manner.	• PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO7 : Leadership Development

Course Learning Outcomes	Assessment Item
CLO1 : Apply abstract theory to concrete problems demonstrating an understanding of the basic principles of strategic analysis including solution concepts.	• Problem sets • Final Exam
CLO2 : Compute pure and mixed strategy Nash equilibria in normal form games.	• Problem sets • Final Exam
CLO3 : Solve perfect information games using backwards induction.	• Problem sets • Final Exam
CLO4 : Compute pure and mixed subgame perfect equilibria in extensive form games.	• Problem sets • Final Exam
CLO5 : Analyse problems and formulate strategic solutions with a focus on ethical and sustainable outcomes, utilising tools provided by the course materials.	• Problem sets • Final Exam
CLO6 : Develop succinct and clear work that reflects ethical and sustainable principles, to communicate ideas presented in a logical, professional and manner.	• Problem sets

Learning and Teaching Technologies

Moodle - Learning Management System | Zoom

Learning and Teaching in this course

Approach to Learning and Teaching in the Course

The lectures, tutorials, and assessments have been designed to appropriately challenge students and support the achievement of the desired learning outcomes. A climate of inquiry and dialogue is encouraged between students and teachers and among students (in and out of class). The lecturers and tutors aim to provide meaningful and timely feedback to students to improve learning outcomes.

Learning Activities and Teaching Strategies

The examinable content of the course is defined by the references given in the lecture schedule, the content of lectures, and the content of the tutorial program.

Lectures

The purpose of lectures is to provide a logical structure for the topics that make up the course, to

emphasise the important concepts and methods of each topic, and to provide relevant examples to which the concepts and methods are applied. All lectures will be recorded and will be available for download. However, the course staff are not experts in recording technology, and will not be responsible for system failure. From our experience, students will likely gain more, and perform better, if they attend class in person than otherwise. Note that lecturers may use the black (or white) board. This use will not show up in recordings.

Tutorials

The purpose of tutorial meetings is primarily to provide an opportunity for small group discussion of the economic concepts and methods, and to use those concepts and methods to understand applied problems assigned in the Homework Assignments. Tutorials will begin from Week 2. Each tutorial is scheduled for 90 minutes. They will take place during the times listed in the Class Timetable. Nearly all tutorials are in-person and on-campus. Please check the mode of delivery and location of your tutorial in the Class Timetable.

Out-of-Class Study

While students may have preferred individual learning strategies, most learning will be achieved outside class time. Lectures can only provide a structure to assist your study, and tutorial time is limited.

An ideal strategy includes:

- Reading the relevant chapter(s) of the text before the lecture - this will give you a general idea of the topic area.
- Attending the lectures. Here the context of the topic in the course and the important elements of the topic are identified. The relevance of the topic is explained, and problem-solving methods are illustrated.
- Staying engaged with the course discussion forum and asking any questions you have about the material.
- Attempting the assigned problems and preparing answers for them. This will identify the things you need to do to demonstrate your understanding of a topic and guide your re-reading of specific parts of the text. This will also provide a self-test of your understanding and identify those parts of the topic with which you have problems.
- Attending tutorials. Although attendance is not mandatory, there is no substitute for attending tutorials for this course

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Program learning outcomes
Problem sets Assessment Format: Individual	48%	Due Date: Friday 5 pm in Weeks 2, 4, 7, and 9	• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development
Final Exam Assessment Format: Individual	52%		• PLO1 : Business Knowledge • PLO2 : Problem Solving • PLO3 : Business Communication • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development

Assessment Details

Problem sets

Assessment Overview

The problem sets are a way for you to make sure you understand the material at each step through the course. Much of the later material in the course builds on the earlier material, so it is essential that you make sure you understand the initial material.

Assesses: PLO1, PLO2, PLO3, PLO5, PLO6, PLO7

BCom students: myBcom course points for PLO7

Course Learning Outcomes

- CLO1 : Apply abstract theory to concrete problems demonstrating an understanding of the basic principles of strategic analysis including solution concepts.
- CLO2 : Compute pure and mixed strategy Nash equilibria in normal form games.
- CLO3 : Solve perfect information games using backwards induction.
- CLO4 : Compute pure and mixed subgame perfect equilibria in extensive form games.
- CLO5 : Analyse problems and formulate strategic solutions with a focus on ethical and sustainable outcomes, utilising tools provided by the course materials.
- CLO6 : Develop succinct and clear work that reflects ethical and sustainable principles, to communicate ideas presented in a logical, professional and manner.

Detailed Assessment Description

There are four problem sets for this course, due Friday 5pm in weeks 2, 4, 7, and 9. Each problem set is worth 12% and is in the form of a take-home test. The problem sets will consist of several questions, which may themselves contain multiple parts. They are designed to test your knowledge on the material presented in the lectures. You are free to discuss the problem sets with your peers but you must complete the problem set by yourself and submit your own individual work.

Problem sets may be neatly handwritten or typed. Because students will be given plenty of time to complete the problem sets, any handwritten submissions must be clear and legible or else they will not be marked.

Final Exam

Assessment Overview

The final exam will test you on the content of the entire course. Everything is examinable unless the instructor explicitly says otherwise.

Assesses: PLO1, PLO2, PLO3, PLO5.

BCom students: myBcom course points for PLO5.

Course Learning Outcomes

- CLO1 : Apply abstract theory to concrete problems demonstrating an understanding of the basic principles of strategic analysis including solution concepts.
- CLO2 : Compute pure and mixed strategy Nash equilibria in normal form games.
- CLO3 : Solve perfect information games using backwards induction.
- CLO4 : Compute pure and mixed subgame perfect equilibria in extensive form games.
- CLO5 : Analyse problems and formulate strategic solutions with a focus on ethical and sustainable outcomes, utilising tools provided by the course materials.

Detailed Assessment Description

The Final Exam will be in the format of a Moodle Quiz. It will be an open-book exam.

General Assessment Information

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:

- Achieve a composite mark of at least 50 out of 100
- Engage actively in course learning activities and attempt all assessment requirements
- Meet any additional requirements specified in the assessment details
- Meet the specified attendance requirements of the course (see Schedule section)

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Normal form games: Nash equilibrium and dominated strategies Gibbons 1.1A, 1.1B. 1.1C
Week 2 : 19 February - 25 February	Lecture	Normal form games: mixed strategies, application of Nash equilibrium Gibbons 1.2A, 1.2B, 1.3A
	Tutorial	Computing Nash equilibria PS1 due Friday at 5 pm
Week 3 : 26 February - 3 March	Lecture	Extensive form games and backward induction Gibbons 2.4.A, 2.1A
	Tutorial	Review of PS1 PS2 (not graded)
Week 4 : 4 March - 10 March	Lecture	Extensive form games: subgame perfect Nash equilibrium and applications Gibbons 2.1.B, 2.2.A, 2.4.B
	Tutorial	Review of PS2 PS3 due Friday at 5 pm
Week 5 : 11 March - 17 March	Tutorial	Review of PS3
	Lecture	Repeated games Applications Gibbons 2.3
Week 6 : 18 March - 24 March	Lecture/tutorials	No lecture or tutorials
Week 7 : 25 March - 31 March	Lecture	Static games of incomplete information Bayes Nash equilibrium and applications Gibbons 3.1A, 3.1B, 3.1C, and examples from notes
	Tutorial	Bayes' rule PS4 due Friday at 5 pm
Week 8 : 1 April - 7 April	Lecture	Bayes Nash equilibrium (contd.) Dynamic games of incomplete information and perfect Bayesian equilibrium Gibbons 3.2 A and 3.2 B Gibbons 4.1
	Tutorial	Review of PS4 PS5 (not graded)
Week 9 : 8 April - 14 April	Lecture	Perfect Bayesian equilibrium and applications. Gibbons 4.2A, 4.2B and examples from notes
	Tutorial	Review of PS5 PS 6 due Friday at 5 pm
Week 10 : 15 April - 21 April	Tutorial	Review of PS6

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Prescribed Resources

The website for this course is on Moodle. It is essential for the successful completion of this course that students watch all lecture videos, as the examination will focus on material presented and discussed in lectures. The required textbook for this course is:

Gibbons, Robert. Game Theory for Applied Economists. Princeton University Press, 1992.

The book is available from the UNSW bookshop. Please use the following link for viewing details: https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780691003955&16132394

Additional material will be posted on the course website.

Course Evaluation and Development

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

The School of Economics strives to be responsive to student feedback. If you would like more information on how the design of this course and changes made to it over time have taken students' needs and preferences into account, please contact the Director of Education at the School of Economics.

We appreciate student feedback because we are always looking for ways to improve your learning experience in this course. Below is a summary of the feedback from the previous student cohort in this course and our response, in terms of how we improved this year's course delivery.

Previous students told us that:

They thought that the best things about the course were:

- "**very interesting** content"
- "**changed my way of thinking**"
- "easy to understand, great lectures"
- "the lecturers and the tutor---all were enthusiastic and **engaging**"

The students suggested that the course could be improved by *more examples and resources*.

We have responded to this feedback by adding more examples in the lecture slides.

Consent for De-Identified Data to be Used for Secondary Research into Improving Student Experience

To enhance your student experience, researchers at UNSW conduct academic research that involves the use of de-identified student data, such as assessment outcomes, course grades, course engagement and participation, etc. Students of this course are being invited to provide their consent for their de-identified data to be shared with UNSW researchers for research purposes after the course is completed.

Providing consent for your de-identified data to be used in academic research is voluntary and not doing so will not have an impact on your course grades. Researchers who want to access your de-identified data for future research projects will need to submit individual UNSW Ethics Applications for approval before they can access your data. A full description of the research activities aims, risks associated with these activities and how your privacy and confidentiality will be protected at all times can be found here.

If you consent to have your de-identified data used for academic research into improving student experience, you do not need to do anything. Your consent will be implied, and your data may be used for research in a format that will not individually identify you after the course is completed. If you do not consent for this to happen, please email the opt-out form to seer@unsw.edu.au to opt-out from having your de-identified data used in this manner. If you complete the opt-out form, the information about you that was collected during this course will not be used in academic research.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Lecturer	Arghya Ghosh		Level 4, UNSW Business School	+61451042855	Wednesdays 2 pm - 3 pm in Weeks 1-5, 7-10, or by appointment	Yes	Yes

Other Useful Information

Academic Information

COURSE POLICIES AND SUPPORT

The Business School expects that you are familiar with the contents of this course outline and the UNSW and Business School learning expectations, rules, policies and support services as listed below:

- Program Learning Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Protocol for Viewing Final Exam Scripts
- Student Learning Support Services

Further information is provided on the key policies and support page.

Students may not circulate or post online any course materials such as handouts, exams, syllabi or similar resources from their courses without the written permission of their instructor.

STUDENT LEARNING OUTCOMES

The Course Learning Outcomes (CLOs) – under the Outcomes tab – are what you should be able to demonstrate by the end of this course, if you participate fully in learning activities and successfully complete the assessment items.

CLOs also contribute to your achievement of the Program Learning Outcomes (PLOs), which are developed across the duration of a program. PLOs are, in turn, directly linked to UNSW graduate capabilities. More information on Coursework PLOs is available on the key policies and support page. For PG Research PLOs, including MPDBS, please refer to the UNSW HDR Learning Outcomes.

Academic Honesty and Plagarism

As a student at UNSW you are expected to display academic integrity in your work and interactions. Where a student breaches the UNSW Student Code with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To assure academic integrity, you may be required to demonstrate reasoning, research and the

process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the Working with Academic Integrity module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Submission of Assessment Tasks

SPECIAL CONSIDERATION

You can apply for special consideration when illness or other circumstances beyond your control interfere with your performance in a specific assessment task or tasks, including online exams. Students studying remotely who have exams scheduled between 10pm and 7am local time, are also able to apply for special consideration to sit a supplementary exam at a time outside of these hours.

Special consideration is primarily intended to provide you with an extra opportunity to demonstrate the level of performance of which you are capable. To apply, and for further information, see Special Consideration on the UNSW Current Students page.

Special consideration applications will be assessed centrally by the Case Review Team, who will update the online application with the outcome and add any relevant comments. The change to the status of the application immediately sends an email to the student and to the assessor with the outcome of the application.

Please note the following:

1. Applications can only be made through Online Services in myUNSW (see the UNSW Current Students page). Applications will not be accepted by teaching staff. The lecturer-in-charge/ course coordinator will be automatically notified when your application is processed.
2. Applying for special consideration does not automatically mean that you will be granted a supplementary exam or other concession.
3. If you experience illness or misadventure in the lead up to an exam or assessment, you must submit an application for special consideration, either prior to the examination taking place, or prior to the assessment submission deadline, except where illness or misadventure prevent you from doing so.
4. If your circumstances stop you from applying before your exam or assessment due date, you must apply within 3 working days of the assessment or the period covered by your supporting documentation.

5. Under the UNSW Fit To Sit/Submit rule, if you sit the exam/submit an assignment, you are declaring yourself well enough to do so and are cannot subsequently apply for special consideration.
6. If you become unwell on the day of – or during – an exam, you must stop working on your exam, advise your course coordinator or tutor and provide a medical certificate dated within 24 hours of the exam, with your special consideration application. For online exams, you must contact your course coordinator or tutor immediately via email, Moodle or chat and advise them you are unwell and submit screenshots of your conversation along with your medical certificate and application.
7. Special consideration requests do not allow the awarding of additional marks to students.

Further information on Business School policy and procedure can be found under "Special Consideration" on the key policies and support page.

LATE SUBMISSION PENALTIES

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the 'wrong' assignment has been submitted.

For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

FEEDBACK ON YOUR ASSESSMENT TASK PERFORMANCE

Feedback on student performance from formative and summative assessment tasks will be provided to students in a timely manner. Assessment tasks completed within the teaching period of a course, other than a final assessment, will be assessed and students provided with feedback, with or without a provisional result, within 10 working days of submission, under normal circumstances. Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Faculty-specific Information

PROTOCOL FOR VIEWING FINAL EXAM SCRIPTS

UNSW students have the right to view their final exam scripts, subject to a small number of very specific exemptions. The UNSW Business School has set a protocol under which students may view their final exam script. Individual schools within the Faculty may also set up additional local processes for viewing final exam scripts, so it is important that you check with your School.

If you are completing courses from the following schools, please note the additional school-specific information:

- Students in the **School of Accounting, Auditing & Taxation** who wish to view their final examination script should also refer to this page.
- Students in the **School of Banking & Finance** should also refer to this page.
- Students in the **School of Information Systems & Technology Management** should also refer to this page.

COURSE EVALUATION AND DEVELOPMENT

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

QUALITY ASSURANCE

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

TEACHING TIMES AND LOCATIONS

Please note that teaching times and locations are subject to change. Students are strongly advised to refer to the Class Timetable website for the most up-to-date teaching times and locations.