CourseCode–

CourseTitle- Bayesian Games

Programme- JSGP Cross Elective

Semester- Fall 2026

Course Information

Course Duration: 15 weeks

Credit Hours: 4

Meetings: TBA

Location: TBA

Prerequisites: Introduction to Game Theory

Equivalent Courses: Incomplete Information Games, Advanced Game Theory

Exclusive Courses: Introduction to Game Theory

Instructor Information

Instructor: Dr. Swagata Bhattacharjee

Biography: Swagata Bhattacharjee completed her Ph.D. from the University of Texas at Austin. Before joining JGU, she was an Assistant Professor of Economics at Ashoka University. Her primary research interest lies in Applied Microeconomic Theory and Experimental Economics. Dr. Bhattacharjee's research has focused on the study of

dynamic contracts under ambiguity, information economics, approximation in auctions, and public good provision. She uses both theoretical and experimental methods.

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Office Hours: TBA

Homepage: https://sites.google.com/site/swagatabhattacharjee/home

1. Course Description

The course will focus on incomplete information games, commonly known as Bayesian games. In Introduction to Game Theory, we developed the theory of complete information games, this elective will take it forward with the extension to incomplete information scenario. In most of the real life strategic interactions, there is incomplete knowledge about other players' true preference (hidden information) or other players' actions (hidden actions). To model these situations, we need specific structure called Bayesian games. There is a wide range of applications of this class of games: from asymmetric information games to Auctions, from signalling games to contract theory. We will cover the structure of such games and focus on several important applications.
(Course description here)

2. Course Intended Learning Objectives (Aim)

CourseIntendedLearning Outcomes	Teaching and Learning Activities	Assessments/Activities
Students will be able to understand the strategic interactions that can be modelled as Bayesian games. They will understand the structure of the game and equilibrium concepts associated.	The course will be primarily lecture based. It will also involve class participation and student led discussions to clarify the core concepts.	There will be in class surprise quizzes, one midterm exam and an end term exam. There will be regular assignments too (not graded).
Students will be able to formulate a real life example into a Bayesian games and solve it to predict the outcome.	The course will have a project component where the students will come up with a real life example and then use the tools learnt in class to formulate a	There will be a project.

	Bayesian game and solve it.	

3. **Scheme of Evaluation and Grading:**
   Evaluation Break up:
   Internal: 70%
   15% on class participation (quizzes and class discussions)
   25% on project
   30% on one midterm exam (in class, duration 90 minutes)
   External: 30%
   30% on final exam.
   Both midterm and final exams will be closed book examinations.

   Grade Definition:

   The course follows the grading scheme set by the university across all schools and courses. To pass a course, the student is required to obtain a minimum of 40% marks in internal and end-term component cumulatively AND a minimum of 30% marks in the end-semester component. The existing grading structure for JGU/JSGP is as follows:

Percentage of marks	**Grade**
80 and above	O
75-79.75	A+
70-74.75	A
65-69.75	A-
60-64.75	B+
55-59.75	B
50-54.75	B-
45-49.75	P1
40-44.75	P2
Below 40	Fail
Incomplete	I
Pass	P
Pass	P#

4. **Academic Integrity**

   Academic Honesty, Cheating, and Plagiarism:

Students are expected to adhere to the highest standards of honesty and integrity during the examinations process. There is a no-tolerance-no-leniency policy towards students using unfair means in class/ exams/ quizzes. For take-home internal assessments, students may work out the problems in groups but they must write out and submit the solutions individually (i.e. no group submissions). It is fairly apparent when solutions are blatantly copied from one another or from the internet. On account of free-riding/plagiarism/unfair-collusion being discovered, the scores will be downscaled as per the penalty norms set under the university's anti-plagiarism policy. For external assessments, the university policy towards use of unfair means shall apply wherein the Unfair Means Committee (UMC) has the mandate to impose penalty for the end-term/external component, including awarding Fail grade to the student found guilty of contravention of Section 29 of the First Ordinance of O.P. Jindal Global University.

Participation/Attendance Policy:

Students are expected to attend all lectures and participate in the interactive sessions. As per the university norms, if a student fails to maintain their attendance more than or equal to 75%, they shall be debarred from writing the end-term examination in this course, leading to receiving Fail grade in the course.

Use of phone/ texting/ laptop:

Use of phone to text/call, or the use of laptop during the lectures are strongly discouraged. If there is an urgent call and the student must receive it, they must receive it outside the lecture room, with the instructor's permission.

For mid-semester examination, students are required to place bags, laptops, mobile phones, smartwatches, or any other electronic devices, and reading or reference material of any kind (without being instructed in the question paper) at the front of the examination hall prior to the commencement of the exam. Possession of such materials would be deemed Use of Unfair Means and the course instructor has the mandate to impose penalty on the student, including awarding zero to the student. For end-semester examination, possession of laptops, mobile phones, smartwatches, or any other electronic devices, and reading or reference material of any kind (without being instructed in the question paper) would be considered Use of Unfair Means and UMC has the mandate to impose penalty for the end-term/external component, including awarding Fail grade to the student found guilty of contravention of Section 29 of the First Ordinance of O.P. Jindal Global University.

5. Keyword Syllabus:

Module I: Static games of incomplete information

a. Bayes Nash equilibrium
b. Asymmetric information: Lemon market (Akerlof)
c. Auction theory (first and second price auctions, revenue equivalence)

Module II: Dynamic games of incomplete information

a. Sequential rationality and Perfect Bayesian Equilibrium
b. Signaling games (Spence education signaling model, separating and pooling equilibrium)
c. Information economics: Cheap talk and information design
d. Contract Theory: moral hazard problem

6. Course Material

Textbooks:

1. **[Tadelis]** Tadelis, Steven. *Game Theory - An Introduction*. The Princeton University Press USA. 2013.
3. Watson, Joel. *Strategy: an introduction to game theory*. W.W. Norton & Company. 2013.
4. Main reference will be lecture notes

7. SessionPlan

Session	GeneralTopic	Readings	Approach/Pedagogy
Week 1	Introduction: Bayesian Games, Bayes Nash equilibrium	Tadelis, notes	Lectures
Week 2	Bayes Nash Equilibrium in the Lemons market	Tadelis, notes	Lectures, Classroom experiments
Week 3	Applications of static Bayesian Games: Real life examples	Tadelis, notes	Lectures, Classroom experiments
Week 4-6	Auctions	Tadelis, notes	Lectures, Classroom experiments
Week 7-8	Dynamic Games of Incomplete Information: Perfect Bayesian Equilibrium	Tadelis, notes	Lectures
Week 9-10	Signalling Games	Tadelis, notes	Lectures
Week 10-11	Information	Tadelis, notes	Lectures, Classroom

	Economics		experiments
Week 12-13	Contract Theory	Tadelis, notes	Lectures, Classroom experiments
Week 14-15	Revision, Group project		Group project