Syllabus template

Semester: 7	
Course : Economics	
Paper Title: Advanced Microeconomics	
Paper code: C4EC230711T	**Credits: 6**
Hours/week : 4 CLASSESS/WEEK + 2 HOURS OF SELF-DIRECTED STUDY	
Category: Core/MDC/SEC/VAC : Core	
Theory / Practical / Composite : Theory	
No of Modules : 2	

Course overview:

1. To study the advanced principles of microeconomic theory with emphasis on firm behavior, optimization, and strategic decision-making.
2. To study the objectives of firms and alternative hypotheses explaining their behavior in different market settings.
3. To study optimization techniques including value functions, duality, and Slutsky decomposition in analyzing consumer and producer behavior.
4. To study key theoretical tools such as Roy's identity, expenditure function, cost function, and related lemmas for economic analysis.
5. To study the fundamentals of game theory, including strategic, zero-sum, and repeated games, Nash equilibrium, and strategy dominance.
6. To study the problem of information asymmetry in markets, focusing on adverse selection and moral hazard in economic interactions.

Course Outcome:

Module 1:

1. Define the theory of firms by identifying various objectives and alternative hypotheses explaining firm behavior.
2. Explain the concept of optimization in economic theory and describe the role of value functions and the envelope theorem in decision-making.
3. Apply the duality approach to derive and interpret relationships between indirect utility, expenditure, and cost functions.
4. Analyze the Slutsky equation, equivalent and compensating variations, and their implications for consumer and producer equilibrium.
5. Evaluate the significance of Roy's identity, Shephard's Lemma, and Hotelling's Lemma in connecting theoretical models to measurable economic behavior.
6. Create integrated analytical frameworks to develop insights into firm optimization, profit functions, and efficiency within microeconomic models.

Module 2:

1. Define the fundamental concepts of game theory, including strategic, zero-sum, normal form, and extensive form games with perfect information.
2. Describe the Min-Max Theorem and explain the determination of the value of a game in strategic interactions.
3. Apply the concepts of dominant and dominated strategies to solve problems involving Nash equilibrium in both pure and mixed strategies.
4. Analyze repeated games and examine how strategic behavior evolves through iteration

and learning in dynamic contexts.				
5. Evaluate real-world applications of game theory in understanding competition, cooperation, and strategic decision-making.				
6. Create models to illustrate situations of information asymmetry by integrating the concepts of adverse selection and moral hazard.				
Prerequisites: *cumulative knowledge of previous semesters needed*				
SYLLABUS				
UNIT/Module	**CONTENT**	**HOURS or NUMBER OF CLASSES**	**CO Mapping**	**COGNITIVE LEVEL**
I.	1. Theory of firms: Firms' Objectives and Alternative Hypotheses. 2. Optimization in Economic Theory: • Value function • Envelop theorem and Duality approach: applications- Indirect utility function • Roy's identity • Expenditure function • Slutsky equation • Equivalent and compensating variation • Cost function • Shepherd's Lemma • Profit function • Hotelling's lemma.	**2 classes per week**	**CO1, CO2, CO3, CO4, CO5, CO6**	**K1,K2, K3, K4, K5, K6**
II.	1. Basics of Game Theory: • Strategic games • Zero-sum games • Min-max theorem • Value of a game • Normal form games • Extensive form games with perfect information • Repeated games 2. Dominant and dominated strategies • Nash EquilibriumPure and Mixed strategy equilibria • Applications of game theory 3. Information asymmetry: • Basic concepts of adverse selection	**2 classes per week**	**CO1, CO2, CO3, CO4, CO5, CO6**	**K1,K2, K3, K4, K5, K6**

	• Moral hazard.			

Text Books

1. **R. Gibbons. Game Theory for Applied Economists, Princeton University Press, 1992**
2. **A. K. Dixit.Optimization in Economic Theory, OUP**
3. **H. R. Varian. Microeconomic Analysis, W. W. Norton & Page 2 of 2 Company, NY, London, (3rd Edition).**

Suggested readings

1. **D. Fudenberg and J. Tirole, Game Theory, MIT Press (1 October 1991)**
2. **J. M. Henderson and R. E. Quandt, "Microeconomic Theory: A Mathematical Approach," McGraw-Hill, Auckland, 1980.**
3. **C. D. Aliprantis and S. K. Chakrabarti, "Games and decision making", Oxford University Press**
4. **Mas-Colell, Whinston and Green (2012): Microeconomic Theory, Oxford University Press.**

Web Resources

NA

Evaluation :CIA: 30 (20+5+5)+ End Semester:70

Paper Structure for Theory Semester Exam Module :

Module	**No. of questions to be answered**	**No. of alternatives given**	**Marks**
Module 1 (20 marks)	3	4	3×5=15
	2	3	2×10=20
Module 2 (15 marks)	3	4	3×5=15
	2	3	2×10=20
		Total	**70**

Course outcomes (COs) and Cognitive Level Mapping

COs	**CO Description**	**Cognitive levels**
	Module 1	
CO1	Define the theory of firms by identifying various objectives and alternative hypotheses explaining firm behavior.	K1
CO2	Explain the concept of optimization in economic theory and describe the role of value functions and the envelope theorem in decision-making.	K2
CO3	Apply the duality approach to derive and interpret relationships between indirect utility, expenditure, and cost functions.	K3
CO4	Analyze the Slutsky equation, equivalent and compensating variations, and their implications for consumer and producer equilibrium.	K4
CO5	Evaluate the significance of Roy's identity, Shephard's Lemma, and Hotelling's Lemma in connecting theoretical models to measurable economic behavior.	K5
CO6	Create integrated analytical frameworks to develop	K6

	insights into firm optimization, profit functions, and efficiency within microeconomic models.	
	Module 2	
CO1	Define the fundamental concepts of game theory, including strategic, zero-sum, normal form, and extensive form games with perfect information.	K1
CO2	Describe the Min-Max Theorem and explain the determination of the value of a game in strategic interactions.	K2
CO3	Apply the concepts of dominant and dominated strategies to solve problems involving Nash equilibrium in both pure and mixed strategies.	K3
CO4	Analyze repeated games and examine how strategic behavior evolves through iteration and learning in dynamic contexts.	K4
CO5	Evaluate real-world applications of game theory in understanding competition, cooperation, and strategic decision-making.	K5
CO6	Create models to illustrate situations of information asymmetry by integrating the concepts of adverse selection and moral hazard.	K6