Discipline Specific Core

University of Kerala

Discipline	ECONOMICS				
Course Code	UK2DSCECO100				
Course Title	Tools for Economic Analysis				
Type of Course	DSC				
Semester	II				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	4	4 hours	-	-	4
Pre-requisites	1. Proficiency in basic mathematics, including arithmetic, algebra, and geometry, is essential. 2. Strong logical reasoning skills and an interest in economics are advantageous for effective learning and application of the course content.				
Course Summary	Upon completing the "Tools for Economic Analysis" course, students will demonstrate proficiency in fundamental mathematical and statistical concepts essential for economic analysis. They will apply these techniques to analyse economic data, solve equations, and interpret measures of central tendency and dispersion. Moreover, students will grasp the intricacies of the real number system and its relevance in economic contexts. Through graphical representations, they will analyze economic functions and acquire skills in data presentation.				

Detailed Syllabus:

Module	Unit	Content	Hrs
I		**Mathematics Fundamentals for Economics**	**10**
	1	Constants – Variables: Dependent, Independent, Discrete and Continuous - Parameters- Exponents- Polynomials *(Conceptual understanding and classification)*	2
	2	Equations- Degree of Equations: Linear, Quadratic and Cubic Simultaneous Equations- Solution of Simultaneous Equations: Simple Simultaneous Equations, Quadratic equations. *[Concept + Application (Problem Solving)]*	4
	3	The Real Number System: Natural Numbers, Integers, Rational and Irrational Numbers, Real Numbers, Complex Numbers and Prime Numbers (*Conceptual Understanding)* Axioms of Real Numbers. *(Conceptual + Basic Application)*	4
II		**Sets, Relations, and Economic Functions**	**10**
	4	Sets – Definition and Notation *(Conceptual understanding)* Forms of Sets- Finite and Infinite sets, Null set, Singleton set, Equal sets, Equivalent sets, Subsets, Superset and Universal set *(Conceptual understanding)* Set Operations -Union, Intersection, Set Difference and Complement *(Conceptual + Basic Application)* Venn Diagram- Union, Intersection, Set difference and Complement. *(Visual Representation)*	5
	5	Ordered Pairs *(Conceptual Understanding)* Cartesian Product *(Conceptual + Simple Application)* Relations *(Conceptual Understanding + Classification)* Domain and Range *(Conceptual + Identification)* Types of Relations - One-to-one relation, Many-to-one relation, One-to-many relation *(Classification and Representation)*	2
	6	Functions – Types of functions: Identity function, Constant Function, Linear Function, Quadratic Function, Polynomial Function, Exponential Function, Logarithmic Function, Explicit and Implicit Functions, Inverse Function, Monotone Function, Functions of two or more variables. *(Definitions with examples only)*	3
		Visual Techniques in Economic Graphs and Functions	**15**
	7	Graphs – Coordinate System- Graphs of Equations in Two Variables *(Foundational Skills + Visual Technique + Functional Graphing)*	2

III	8	Graphs of Functions: First-Degree, Second-Degree and Third-Degree Functions *(Drawing and Interpretation)*	2
	9	Formula for Distance between two points- Slope of a Straight line – Intercepts *(Conceptual Understanding + Visual Technique + Formula Application)*	3
	10	Functions and Diagrams in Economics: Demand function and curves, Supply function and curves, Cost functions and Cost curves, Total revenue functions and curves, the Production function, the Consumption function, and the Indifference curve. *(Conceptual Understanding + Visual Technique + Graphical Interpretation)*	8
IV	**Foundations of Data Analysis: Understanding and Applying Statistical Measures**		**13**
	11	Meaning of Data- Classification of Data: Primary and Secondary – Census Method and Sample Method – Classification of Data *(Concept and Classification with Examples)*	2
	12	Frequency Tables: Discrete and Continuous, Exclusive and Inclusive – Cumulative Frequency Tables- Tabulation *(Concept and Classification with Examples and Construction)*	5
	13	Presentation of Data: Diagrams and Graphs; Types of Diagrams; Types of Graphs: *(Concept and Classification with Examples and Visual Representation)*	6
	14	Various Central Tendency Measures. Arithmetic Mean- Properties, Merits and Demerits- Different Methods of Calculation. Median- Properties, Merits and Demerits- Different Methods of Calculation. Mode- Properties, Merits and Demerits- Different Methods of Calculation. Harmonic Mean, Geometric Mean. *[Demonstrate the different methods of calculation (direct, shortcut, step deviation methods, etc., where applicable)].*	
	15	Dispersion- Absolute and Relative Measures- Range, Quartile Deviation, Mean Deviation, Standard Deviation. *(Demonstrate formulas and step-by-step calculation methods for each measure)*	
V	**Activity: Data Presentation Workshop**		**12**
		To familiarize students with different types of diagrams and graphs for presenting data effectively., design a simple activity focusing on data presentation using diagrams and graphs.	

Reference

- Chiang, A.C. & Wainwright, K. (2013). Fundamental Methods of Mathematical Economics. (4th ed.). McGraw Hill Education (India) Private Limited.
- Sydsaeter, K. & Hammond, P. (2016). Mathematics for Economic Analysis. New Delhi: Pearson Education Inc
- Dowling, E. T. (2012). Schaum's Outlines-Introduction to Mathematical Economics. (3rd ed.)
- Goon, A.M., Gupta M.K. and Dasgupta, B. (2002). Fundamentals of Statistics, Vol. I, 8th Ed. The World Press, Kolkata.
- Mood, A.M., Graybill, F.A. and Boes, D.C. (2007). Introduction to the Theory of Statistics, 3rd Ed., (Reprint), Tata McGraw-Hill Pub. Co. Ltd

Recommended Readings

- Bradley, T. (2013). Essential Mathematics for Economics and Business. London: John Wiley & Sons.
- Renshaw, G. (2011). Maths for Economics. (4th ed.). Oxford: Oxford University Press.
- Roser, M. (2003). Basic Mathematics for Economists. (2nd ed.). New York: Routledge.
- Ross, S. M. (2010). Introductory statistics, 3rd Ed., Academic Press
- S P Gupta, Statistical Methods, Sultan Chand and Sons.

Course Outcomes

No.	Upon completion of the course, the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Create and solve diverse forms of equations relevant to economic analysis, demonstrating efficiency and conceptual understanding.	R, U, Ap, An, E, C	PSO- 3
CO-2	Analyze Frequency Tables and Graphical Representations of Economic Data	R, U, Ap, An.	PSO- 1,3
CO -3	Create and interpret graphical representations of economic functions	R, U, Ap, An, E, C	PSO- 3
CO - 4	Create economic data sets and evaluate them using appropriate measures of central tendency and dispersion.	R, U, Ap, An, E, C	PSO- 1,3

CO-5	Evaluate the Significance of Statistical Measures in Economic Analysis	R, U, Ap, An, E	PSO- 3

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Note: 1 or 2 COs/module

Name of the Course: Credits: 4:0:0 (Lecture:Tutorial:Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/Tutorial (T)	Practical (P)
1	Create and solve diverse forms of equations relevant to economic analysis, demonstrating efficiency and conceptual understanding."	3	U, Ap, An, E, C	P	L	
2	Analyze Frequency Tables and Graphical Representations of Economic Data	1,3	R, U, Ap, An.	C	L	
3	Create and interpret graphical representations of economic functions	3	R, U, Ap, An, E, C	F, C.	L	
4	Create economic data sets and evaluate them using appropriate measures of central tendency and dispersion.	1,3.	R, U, Ap, An, E, C	P	L	
5	Evaluate the Significance of Statistical Measures in Economic Analysis	5	R, U, Ap, An, E	C		

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

CO No.	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	Average
CO1	-	-	2	-	-	-	3	3	-	-	-	2	2.5

CO2	1	-	3	1	-	-	3	3	-	1	-	2	2
CO3	2	1	3	2	2	1	3	2	1	2	1	3	1.92
CO4	2	1	3	2	2	2	3	3	2	2	1	3	2.167
CO5	2	2	3	3	3	2	3	3	3	2	2	3	2.58
Average	1.75	1.33	2.8	2	2.33	1.67	3	2.8	2	1.75	1.33	2.6	

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics :

CO No.	Internal Exam	Assignment	Project Evaluation	End Semester Exam
CO1	✓	✓	-	✓
CO2	✓	✓	-	✓
CO3	✓	✓	✓	✓
CO4	✓	✓	✓	✓
CO5	✓	✓	✓	✓