Course Plan
0542 ECON 123
Probability and Sampling

Course Code: 0542 ECON 123
Course Title: Probability and Sampling
Credit: 3
Year: 1st Year
Semester: 2nd Semester
Course Status: GED
Total Marks: 100
Course Instructor: Professor Dr. Rafia Islam Lina

Weekly Teaching Plan:

Week	Topic	Unit	CLO	Teaching Strategy	Assessment
Week 1	Probability, Experiment, Outcome, and Sample Space, Calculating Probability,	Unit 1	CLO 1	Interactive lecture, discussion	Participation
Week 2	Marginal Probability, Conditional Probability, and Related Probability Concepts	Unit 1	CLO 1	Lecture, examples, Graphical explanation	Quiz
Week 3	Random Variables, Probability Distribution of a Discrete Random Variable, Mean and Standard Deviation of a Discrete Random Variable	Unit 2	CLO 2	Lecture with diagrams	Assignment
Week 4	The Binomial Probability Distribution, The Hypergeometric Probability Distribution, The Poisson Probability Distribution	Unit 2	CLO 2	Group exercises	Class test
Week 5	Continuous Probability Distribution and the Normal Probability Distribution	Unit 2	CLO 2	Group exercises	Review
Week 6	**Midterm Examination -I**				
Week 7	Standardizing a Normal Distribution, Applications of the Normal Distribution, Determining the *z* and *x* Values When an Area Under the Normal Distribution	Unit 2	CLO 2	Interactive lecture, Numerical exercises	Home task

	Curve Is Known, The Normal Approximation to the Binomial Distribution				
Week 8	Expected value; Properties of Expected Value; Variance; Properties of Variance; Covariance; Conditional Expectation; Conditional variance	Unit 3	CLO 3	Concept discussion	Quiz
Week 9	Advantages of Sampling, Types of Sampling, Sampling Error, Non-Sampling Error, Objectives and Importance of Sample Survey, Definition of Population,	Unit 4	CLO 4	Graph analysis, Problem based learning	Case discussion
Week 10	Appropriateness of Data to be collected, Designing a Questionnaire, Choice of the Sampling Unit, Sample Size, Sample Design and Sample Selection, Internal and External Validity of Sample Selection.	Unit 4	CLO 4	Lecture	Class Test
Week 11	Population and Sampling Distributions, Mean and Standard Deviation of Sampling from a Normally Distributed Population, Sampling from a Non-Normal Population.	Unit 5	CLO 4	Graphical analysis	Quiz
Week 12	**Midterm Examination -II**				
Week 13	Application of the Sampling Distribution of Population and Sample Proportions, Mean, Standard Deviation and Shape of the Sampling Distribution, Application of the Sampling.	Unit 5	CLO 4	Lecture discussion	Review
Week 14	Definitions, Characteristics and Properties of chi-square, Student's t and the F distributions with their Uses.	Unit 6	CLO 5	Case study	Review

Assessment Plan:

Assessment Type	Marks
Before Final (Continuous Assessment)	40
Final Examination (Summative Assessment)	60
Detail Breakdown of Before Final Assessment	
Heads of Assessment	**Marks Assigned**
Class participation & Attendance	5
Quizzes/ Assignments/ Class tests/ Presentation (at least 3 assessment)	15
2 Midterm Examination	10*2 =20
Information about Final Assessment	
At the end of the semester the students will be asked to sit for a final examination. Eight questions will be set from the content and students have to answer 5 and each question carries 12 marks. Detail guideline will be provided during the class.	

Selected Readings:

Texts:

1. Prem S. Mann. (2018) Introductory Stattistics (10 th ed.). wiley
2. Ed. Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2023). *Statistics for business and economics* (15th ed.).

References:

1. Allen Webster: *Applied Statistics for Business and Economics.*
2. S.P.Gupta: *Advanced Practical Statistics.*
3. Wonnacott and Wannacott: *Introduction to Statistics.*
4. MurryR.Spiegel: *Theory & Problems of Statistics.*

Assessment Rubrics:

Quiz Rubric:

Criteria	(4) Excellent (80% - 100%)	(3) Good (70% - 79%)	(2) Satisfactory (60% - 69%)	(1) Needs Improvement (< 60%)
Conceptual Understanding	Clear and accurate understanding of concepts	Good understanding with minor errors	Basic understanding with some confusion	Poor understanding
Accuracy of Answers	All answers correct with explanation	Most answers correct	Some correct answers	Mostly incorrect
Application of Concepts	Correct application to problems	Minor mistakes in application	Limited application	Unable to apply concepts
Clarity of Explanation	Clear and well organized	Generally clear	Lacks clarity	Unclear explanation

Assignment / Homework Rubric:

Criteria	(4) Excellent (80% - 100%)	(3) Good (70% - 79%)	(2) Satisfactory (60% - 69%)	(1) Needs Improvement (< 60%)
Understanding of Economic Theory	Deep understanding of theories	Good understanding with minor gaps	Basic understanding	Limited understanding
Problem Solving Skills	Correct solutions with clear steps	Minor errors in calculation	Partial solution	Incorrect solution
Application to Real-world Issues	Strong connection with real examples	Some real-world examples	Limited application	No application
Organization and Presentation	Well-structured and formatted	Mostly organized	Needs improvement	Poor organization

Class Test / Midterm Rubric:

Criteria	(4) Excellent (80% - 100%)	(3) Good (70% - 79%)	(2) Satisfactory (60% - 69%)	(1) Needs Improvement (< 60%)
Conceptual Knowledge	Thorough understanding	Good understanding	Basic understanding	Limited knowledge
Graphical / Mathematical Analysis	Accurate diagrams and calculations	Minor mistakes	Partially correct	Incorrect
Logical Economic Reasoning	Strong reasoning	Reasonable reasoning	Weak reasoning	No reasoning
Completeness of Answer	Fully addresses question	Mostly complete	Partially complete	Incomplete

Presentation / Case Study Rubric:

Criteria	(4) Excellent (80% - 100%)	(3) Good (70% - 79%)	(2) Satisfactory (60% - 69%)	(1) Needs Improvement (< 60%)
Understanding of Economic Issues	Strong understanding	Good understanding	Basic understanding	Limited understanding
Analytical Ability	Critical analysis	Some analysis	Limited analysis	No analysis
Use of Economic Models	Correct application	Mostly correct	Some incorrect use	Incorrect use

Communication Skills	Clear and confident	Generally clear	Some difficulty	Poor communication
Visual Materials	Effective visuals	Adequate visuals	Limited visuals	No visuals

Final Examination Rubric:

Criteria	**(4) Excellent (80% - 100%)**	**(3) Good (70% - 79%)**	**(2) Satisfactory (60% - 69%)**	**(1) Needs Improvement (< 60%)**
Knowledge of Concepts	Comprehensive understanding	Good knowledge	Basic understanding	Limited knowledge
Analytical Skills	Correct analysis using models	Minor analytical errors	Partial analysis	Incorrect analysis
Graphical Representation	Accurate diagrams and interpretation	Minor diagram errors	Basic diagrams	Incorrect or missing diagrams
Critical Evaluation	Strong evaluation of outcomes	Reasonable evaluation	Limited evaluation	No evaluation