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- **Course description:** This course deals with statistical techniques .the major topics include frequency distribution, measures of central tendency , variation, probability, random variables and their distributions, estimation and hypothesis testing.

**Aims of the course:**

- 1-Gain an understanding of the basic statistical techniques used in processing, summarizing, and analyzing data.
- 2-Develop an understanding of probability theory and probability distributions.
- 3-Understand construction of the parameter estimation and testing of hypotheses.

**Intended Learning Outcomes: (ILOs)**

**A. Knowledge and Understanding**

**A1. Concepts and Theories:**

- New theories and concepts of Probability and statistics.
- Analytical procedures for solving probability and statistics.

**A2. Contemporary Trends, Problems and Research:**

- Structured course materials delivered through a sequential delivery of lectures, with an introductory lecture focusing on the significance of the course.
- Interactive learning process through questions and answers in class.
- Problem solving classes and discussion.
- Using whiteboard in describing topic.
- Encouraging student to attend classes and tutorials.

**A3. Professional Responsibility:**

- Exams and homework are used to assess the acquired knowledge on the subject.
- Short quizzes at the end of each topic are used to evaluate the student understanding.

**B. Subject-specific skills**

**B1. Problem solving skills:**

- Students will be able to apply the fundamentals of that they have learned in this course to solve problems.
- The students will develop the ability to think independently and solve problems on his own.
- The students are encouraged to be organized and systematic in solving problems.



## **B2. Modeling and Design:**

- Lectures are followed by numerous examples, some of which are practical in nature, to illustrate the application of learned theories.
- Problem classes are used to explain further the theories and to help the students apply them in solving problems.
- Classroom student interaction with questions and answers.

## **B3. Application of Methods and Tools:**

- Exams and homework will include problems, solution of which requires critical thinking and identification of correct formulas.

Class discussion

## **C. Critical-Thinking Skills**

### **C1. Analytic skills: Assess**

- \* Description of the interpersonal skills and capacity to carry responsibility to be developed.
- \* Punctual attendance of classes and tutorials.
- \* Responsibility to solve given assignments on their own and submit the solution on time.
- \* Time management in study of course materials.
- \* Use of university library and web search for collecting information

### **C2. Strategic Thinking:**

- \* Participation of students in classroom discussion

### **C3. Creative thinking and innovation:**

- Class attendance of students at the beginning of the lecture is recorded.
- Recording of submission of assignment and the grades.

## **D. General and Transferable Skills (other skills relevant to employability and personal development)**

### **D1. Communication:**

Ability of the students to apply basic knowledge of mathematics in solving probability and statistics.  
Effective communication with the lecturer and colleague.

### **D2. Teamwork and Leadership:**

Teaching strategies to be used to develop these skills

Test questions and assignments that require students' knowledge in mathematics and their computational capabilities for solving problems.



**Course structures:**

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	A1,A2,B1C1	Data Collection, Survey, Types of data, Sampling techniques	lecture	Exam and homeworks
2	3	A1,A2,B1,B2,C1	Data representation: Dot Diagrams, Stem and Leaf Displays, Frequency Distributions, Graphical Presentations.	lecture	Exam and homeworks
3	3	A1, A2,B1, C2	Measures of Location (The Mean, Median, Mode, and Quartiles) Measures of Variation (The range, Variance, Standard Deviation)	lecture	Exam and homeworks
4	3	A1,A2,B1,B2,C1	Techniques Of Counting, Permutations, Combinations.	lecture	Exam and homeworks
5	3	A1, A2,B1,C2	Sample Space and Events, Axioms of Probability.	lecture	Exam and homeworks
6	3	A1,A2,B1,B2C1	Conditional Probability, Independence, Multiplication rule, Bayes Theorem.	lecture	Exam and homeworks
7	3	A1,A2,B1,B2,C1	Distribution and Expectation of Random Variables, Functions of Random Variables.	lecture	Exam and homeworks
8	3	A1,A2,B1,B2,C1	Discrete Random Variables, Continuous Random Variables.	lecture	Exam and homeworks
9	3	A1,A2,B1,B2,C1	Binomial Distribution, Normal Distribution, Poisson Distribution.	lecture	Exam and homeworks
10	3	A1,A2,B1,B2,C1	The Estimation of Means, The Estimation of Differences Between Means	lecture	Exam and homeworks
11	3	A1,A2,B1,B2,C1	The Estimation of Variance, The Estimation of the Ratio of Two Variances	lecture	Exam and homeworks
12	3	A1,A2,B1,B2,C1	Test Concerning Means, Test Concerning Differences Between Means.	lecture	Exam and homeworks
13	3	A1, A2,B1,C2	Test Concerning Variance, Regression Analysis.	lecture	Exam and homeworks
14	3	A1, A2,B1,C2	Pearson's Correlation Coefficient, Spearman's Correlation Coefficient	lecture	Exam and homeworks

**References:**

- **Main Textbook:** Mendenhall W.Beaver R.Beaver Introduction to Probability and Statistics
- **Supplementary Textbook(s):** 1-Fleming M.C Principal of applied Statistics.
- 2- Freund ,J.E. Modern Elementary Statistics.
- 3- Spiegel ,M.R. Introduction to Statistics

**Assessment Methods:**

Methods	Grade	Date
First exam	25 %	6-th week
Second Exam	25%	10-th week
Final Exam	50%	

