

**College of Engineering Pune**  
**(An Autonomous Institute of Government of Maharashtra, Pune-411005)**  
**Department of Mathematics**

**(ML 18007) Statistical and Quantitative Methods in Planning II**

**F.Y. B. Planning Semester II**

Teaching Scheme

Lectures : 2 hrs / week

Tutorial : 1 hr / week

Examination Scheme

Internal Test 1: 20 marks

Internal Test 2: 20 marks

End Sem. Exam: 60 marks

**Unit I : Correlation and Regression Analysis**

Degree of correlation, Scatter Diagram, correlation analysis, correlation co-efficient, coefficient of rank correlation, simple Linear regression, lines of regression, coefficient of regression.

**[06 Hrs]**

**Unit II : Statistical Inference**

Types of estimation; point, interval, testing of hypothesis, statistical hypothesis, simple and composite tests of significance, null hypothesis, alternative hypothesis, types of errors, level of significance, critical region; two tailed and one tailed tests, large and small sample tests for mean and proportion; Applications in planning.

**[08 Hrs]**

**Unit III : Chi-Square Test and Analysis of Variance (ANOVA)**

Chi-square distribution: applications of chi-square distribution; test of goodness of fit; ANOVA distribution; Applications in planning

**[06 Hrs]**

**Unit IV : Decision Theory**

Decision making under conditions of certainty, uncertainty, and conditions of risk, decision trees, pay off matrix.

**[08 Hrs]**

**Text Book :**

- Statistical Methods by S.P. Gupta, Sultan Chand and Sons, (Latest Edition)

## Reference Books :

1. Applied Statistics by S.C. Gupta and V.K. Kapoor, Sultan Chand Publishers.
  2. Problems and Solutions in Statistics by V.K. Kapoor, Sultan Chand Publishers.
  3. Fundamentals of Statistics by S.C. Gupta, Himalaya Publications.
  4. Statistical Methods for Social Scientists by K.A. Yeomans, Penguin Education Series.
  5. The practice of Business Statistics by Manish Sharma and Amit Gupta, Khanna Publishing Company Private Limited, New Delhi.
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**Outcomes :** Students will be able to

1. **remember** correlation and regression, **define** estimation, **know what** is decision making.
2. **understand** scatter diagram, statistical inference, types of estimation and hypothesis.
3. **calculate** correlation, regression coefficients and find lines of regression, **apply** tests of hypothesis for various population parameters.
4. **apply** chi-square test for different problems, perform analysis of variance, **find** decision trees and pay off matrix.
5. **apply** qualitative and quantitative techniques to problems in planning including case studies.

### Note 1 :

- To measure CO1, questions may be of the type- define, identify, state, match, list, name etc.
- To measure CO2, questions may be of the type- explain, describe, illustrate, evaluate, give examples, compute etc.
- To measure CO3, questions will be based on applications of core concepts.
- To measure CO4, questions may be of the type- true/false with justification, theoretical fill in the blanks, theoretical problems, prove implications or corollaries of theorems, etc.
- To measure CO5, some questions may be based on self-study topics and also comprehension of unseen passages.

**Note 2 :**

All the Course outcomes 1 to 3 will be judged by 75% of the questions and outcomes 4 and 5 will be judged by 25 % of questions.