Course Title:	Statistical Inference-II
Course Code:	STAT-406
Semester:	VIII
Credit Hours:	3 Credit Hours
Pre-requisites:	Statistical Inference-I

Learning Outcomes
By the end of this course, students will be able to:
1. Learn different methods of estimation and their properties.
2. Get detailed insight on Interval estimation and its various methods.
3. Have sufficient knowledge of testing hypotheses under varied circumstances.

Course Outline
Unit 1
1.1 Methods of Estimation
Method of moments, Maximum likelihood method and its properties. Method of least squares and its properties. Ordered least squares estimation of location and scale parameters. Minimum chi-square method.
1.1 Interval estimation
Confidence interval and its interpretation. One-sided confidence intervals. Methods of finding confidence intervals. Pivotal quantity method. Confidence intervals for the mean and variance. Confidence region for the mean and variance. Large-sample confidence intervals. Bayesian interval estimates. Shortest sets of confidence intervals.
Unit 2
2.1 Tests of Hypotheses
Simple and composite hypotheses. Power function. Size and power of a test. Randomized and Non-randomized tests. Most powerful tests. Neyman-Pearson lemma. Loss function and Risk function. Bayes test. Generalized likelihood-ratio tests. Uniformly most powerful tests, unbiased test. Monotone likelihood ratio tests of hypotheses. Sequential probability ratio test. Approximate sequential probability ratio test. Average sample number.

- **Teaching-learning Strategies:**
Class Lecture method, which includes seminars, discussions, assignments and projects. (Audio-visual tools are used where necessary)

- **Assignments-Types and Number with calendar:**
According to the choice of respective teacher.

- **Assessment and Examinations:**
According to the University's Semester Rules.

Sr. No.	Elements	Weightage	Details
1	Midterm Assessment	35%	It takes place at the mid-point of the semester.
2	Formative Assessment	25%	It is continuous assessment. It includes: Classroom participation, attendance, assignments, and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

Text Books
1. Casella, G., & Berger, R.L. (2008). *Statistical Inference.* Cengage Learning, New York, USA.
2. Hogg, R.V., & Tanis E.A. (2009). *Probability and Statistical Inference* (7th ed.). Macmillan Publishing Company, New York.

Suggested Readings
1. Hoel, P.G. (1984). *Introductions to Mathematical Statistics* (5th ed.). John Wiley and Sons, New York.
2. Hogg, R.M., McKean, J., & Craig, A.T. (2013). *Introduction to Mathematical Statistics.* Prentice Hall, New Jersey, USA
3. Lehman, E.L. (2003). *Theory of Point Estimation* (2nd ed.). John Wiley and Sons, N.Y
4. Mood, A.M., Graybill, F.A., & Boes, D.C. (2007). *Introduction to the Theory of Statistic.* McGraw Hill, New York, USA.
5. Rao, C.R. (2001). *Linear Statistical Inference and its Applications* (2nd ed.). John Wiley and Sons, New York.