INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad -500 043

COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

Course Name	**PROBABILITY AND STATISTICS**
Course Code	AHS010
Programme	B.Tech
Semester	II
Course Coordinator	Mr. J Suresh Goud
Course Faculty	Ms. P Srilatha
Lecture Number	37
Topics Covered	Problems on Estimation
Course Learning Outcome's	Understand the concept of estimation for classical inference involving confidence interval.

Confidence Interval:

A Confidence Interval (CI) refers to the amount of uncertainty associated with a sample population estimate (the mean or proportion) of a true population.

Example:

To determine the average age of victims of robberies in Chicago last year. Now, while there is a true answer, say 30 years old, the best you can do is find an interval that that true answer probably lies in, say, 20-40 years old.

Note:

Before calculating the CI from a sample mean or proportion, choose either a 90%, 95%, or 99% confidence level (CL). This is the amount of uncertainty in the sampling method. Meaning each time the same sampling method is used, the true population value would be represented in 90%, 95%, or 99% of all the sample estimated CI's. That also means that 10%, or 5%, or 1% would not contain the true population score.

Level of significance:

The null hypothesis is rejected if the p-value is less than a predetermined level, α. α is called the significance level, and is the probability of rejecting the null hypothesis given that it is true (a type I error). It is usually set at or below 5%.

Maximum Error:

The maximum difference between the point estimate and the actual parameter, which is 1/2 the width of the confidence interval for means and proportions.

$$E = Z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}$$