Information of the course on "Probability & Statistics (CSL003P1M)" for M.Tech. students at IIT Jammu, India

<u>Course contents:</u>

- Introduction to Probability, conditional Probability, Baye's theorem; Random variables, Analysis of discrete and continuous random variables. Probability distributions, distribution functions, mean and variance of random variables, standard discrete and continuous distributions and their properties.

- Analysis of Joint Probability Distributions of discrete and continuous random variables, Two or more random variables, joint, marginal and conditional probability distributions, independence of random variables. Covariance and correlation, Linear functions of random variables, several functions of random variables.

- Point estimation of Parameters and Sampling distributions: Central limit theorem, General concepts of point estimation, Methods of point estimation, method of moments, method of maximum likelihood. Bayesian estimation of parameters, Interval estimation, Confidence interval for the mean and variance of a normal population, large sample confidence interval for population proportions.

- Hypothesis Testing, general concepts, tests on mean and variance of one and two normal populations, tests on population proportion, testing for goodness of fit and independence; Introduction to nonparametric statistics, sign test, Wilcoxon signed rank test, Wilcoxon rank sum test.

<u>Credit system for the course:</u>

- 20 marks for class tests. There will be two class tests.

- 30 marks for Mid-Sem exam.

- 50 marks for End-Sem exam.

<u>References for the course:</u>

1. Sheldon M. Ross; An Introduction to Probability Models, 10th Edition, Academic Press, 2010.

2. R.E. Walpole, R.H. Myers, S.L. Myers and K. Ye; Probability and Statistics for Engineers, 9th Edition, Pearson publication, 2017.

3. Sheldon M. Ross; Introduction to Probability and Statistics for Engineers and Scientists, 5th Edition, Academic Press, 2014.