**COURSE PLAN**

**For**

**Probability and Statistics (ECSE231L)**

Faculty Name : Dr. Tanveer Ahmed, Dr. Deepika Vatsa, Dr Vishal Srivastava, Dr Simarpreet Singh

Course Type : Core

Semester and Year: III Semester and II Year

L-T-P : 3-0-2

Credits : 4

Department : Computer Science Engineering

Course Level : UG

**SCHOOL OF ENGINEERING AND APPLIED SCIENCES**

**Department of Computer Science Engineering**

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| Bennett University  Greater Noida, Uttar Pradesh |

# COURSE CONTEXT

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| **SCHOOL** | **SEAS** | **VERSION NO. OF CURRICULUM/SYLLABUS THAT THIS COURSE IS A PART OF** | **Version 2** |
| **DEPARTMENT** | **CSE** | **DATE THIS COURSE WILL BE EFFECTIVE FROM** | **Jul-Dec, 2020** |
| **DEGREE** | **B. Tech.** | **VERSION NUMBER OF THIS COURSE** | **Version 1** |

COURSE BRIEF

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| **COURSE TITLE** | **Probability and Statistics** | **PRE-REQUISITES** | **NA** |
| **COURSE CODE** | **ECSE231L** | **TOTAL CREDITS** | **4** |
| **COURSE TYPE** | **Core** | **L-T-P FORMAT** | **3-0-2** |

# COURSE SUMMARY

Probability, conditional probability, independence, random variables, expected value, moment generating function, probability generating function, characteristic function, specific discrete and continuous distributions, covariance, correlation coefficient, central limit theorem. Sampling distributions, point and interval estimation, testing of hypothesis, goodness of fit and contingency tables, ANOVA, Correlation v/s Causation, linear regression, multiple Regression, Linear and Non-Linear Regression, Parameters estimation via LSE..

# COURSE-SPECIFIC LEARNING OUTCOMES (CO)

By the end of this program, students should have the following knowledge, skills and values:

CO1: To make students understand basic probability theory and statistics, and important laws therein.

CO2: To make students know different standard distributions, and how these can be used to model different real life situations.

CO3: To make students apply different statistical hypothesis tests to data set, and make decisions.

How are the above COs aligned with the Program-Specific Objectives (POs) of the degree?

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# Detailed Syllabus

**Module 1 (Contact hours: 12)**

Probability, conditional probability, independence, total probability theorem, Bayes’ theorem, Random variables: discrete and continuous, Moments- Expectation, Variance, Covariance, Correlation coefficient, Moment generating function, probability generating function, characteristic function.

**Module 2 (Contact hours: 10)**

Specific discrete and continuous distributions: Uniform, Binomial, Poisson, geometric, Exponential, Normal, Central limit theorem.

**Module 3 (Contact hours: 20)**

Visualizing data; Create and interpret histograms, bar charts and frequency plots; measures of central tendency, and variability, Sampling distributions- t and F distributions, Parameter estimation, Least square estimation method, Maximum Likelihood estimation, Confidence intervals, Hypothesis testing- z test, t test, F test; ANOVA: test of difference between groups, Linear regression, multiple regression, Markov Chain.

# TEXTBOOKS/LEARNING RESOURCES:

# a) Sheldon M. Ross, Introduction to Probability and Statistics for Engineers and Scientists (4 ed.), Academic Press, 2009. ISBN 978-123704832.

# b) Michael Baron, Probability and Statistics for Computer Scientists (1 ed.), Chapman and Hall book, 2003. ISBN 978-1584886419.

# REFERENCE BOOKS/LEARNING RESOURCES:

1. Paul L. Meyer, Introductory Probability and Statistical Applications (2 ed.), Addison-Wesley, 1970. ISBN 978-0201047141.

**Evaluation Components:**

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| **Components of Course Evaluation** | **Percentage** |
| Mid Term Examination | 20 |
| End Term Examination | 35 |
| Assignment | 20 |
| Lab Continuous Evaluation | 15 |
| Quiz | 10 |