Course Title and Code	STAT126 - Probability and Statistics

I. Course Identification and General Information:

Course Title	Probability and Statistics	Course Code	STAT126	Pre-requisite	STAT100
Department	Computer Engineering	Course Level	4	Credit Hours	3 (3+0)

II. Course Description/Topics: The following course topics will be covered.

- Introduction on Thinking for Decision-making.
- Organizing and graphing Data.
- Numerical Descriptive measures.
- Hypothesis tests about the mean and proportion.
- Applications of the Chi-square statistic.
- Regression modeling and analysis.
- Index numbers with applications.
- Probability, discrete probability distribution, and continuous probability densities.
- Combinatorics.
- Conditional probability, important distributions, and densities.
- Expected value and variance.
- Sums of Random variables.
- Law of large number, central limit theorem.
- Generating functions, Markov chains, random walk.

III. Course Outcomes: Summary of the main learning outcomes for students enrolled in the course.

- Describe the basic concepts of statistics and probability.
- Create and interpret data using various methods of displaying circle graphs, histograms, and frequency curves, and make predictions about outliers.
- Determine possible outcomes using tree diagrams and the counting principles of permutations and combinations.
- Express the chances of events occurring in terms of either a probability or odds.
- Interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation.
- Interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation.
- Describe individual performances in terms of percentiles,
- Test the validity of a hypothesis using appropriate statistical concepts.
- Calculate the Chi-Square values for a given population.
- Perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis.
- Perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the regression equation.
- Calculate the index number.
- Identify the concepts and application of central limit theorem, Markov chains and Random Walks

IV. Required Text:

- Introduction to Probability and Statistics, by Grinstead and Snell, © 2006 | ISBN-10: 0821807498 | ISBN-13: 9780821807491 ,American mathematical society

V. References:

- Introduction to Statistics, 7th edition by Prem S. Mann, © 2011 John wiley and sons ,ISBN:978-0-470-50583-0