

Department of Telecommunication Engineering**Course Name: Random Variables and Probability (100646233)****Total Credits: 3****Contact Credits: 3 hours per week****Course Type:** Compulsory**Categorization of Credits:** Engineering topic**Prerequisites** Calculus 2 (10221102)**Course Description**

This course gives an introduction to probability and statistics for engineers including; probability, combinatory, random variables, functions of random variables, moments, inequalities and limit theorems, statistics, regression and estimation theory, autocorrelation and cross correlation of analogue and discrete data, hypothesis testing, system reliability, and computer usage in solving problems involving probability and statistics.

Course Learning Outcomes (CLO's)		Student Outcomes (SO's)	Performance Indicators (PI's)	Contribution %
i	An ability to introduce the basic concepts of probability theory and its applications.	1	1.1	20%
ii	An ability to recognizing the basic concepts of statistical models and its importance in analyzing data, and recognizing the effect of variability in solving problems.	1	1.3	30%
iii	An ability to develop problem-solving techniques needed to accurately calculate probabilities.	1	1.2	30%
iv	An ability to demonstrating industry and management related problems, including data collection, analysis, and model utilization.	6	6.2	20%
v				

Textbook and/ or References

1. Douglas C. Montgomery, George C. Runger, 2014. Applied Statistics and Probability for Engineers, 6th Edition, John Wiley and sons.

Assessment Criteria	Percent (%)
Midterm Exam	25 %
Course Project (Ref. to appendix. for details)	40 %
Final Exam	45 %
Total	100%

Course Plan	
Week	Topic
1	The role of statistics in engineering.
2-3	Probability
4-5	Discrete Random Variables and Probability Distributions
6-8	Continuous Random Variables and Probability Distributions
9-10	Joint Probability Distributions
11	Descriptive Statistics
12-13	Random Sampling and Data Description
13-14	Point Estimation of Parameters and Sampling Distributions
15-16	Statistical Intervals for a Single Sample

Important Notes:

- **Contact Credit:** number of actual hours for the course (ex: 5 hours per week, 3 theoretical and 2 practical hours).
- **Categorization of Credits:** Math and basic science ,Engineering topic and/or other.
- **4-7 CLOs for each course as long as they are enough to cover the course subjects and accurately map with the PIs**
- **1-1 mapping between CLOs and PIs (CLO mapped to only one PI and one PI could be mapped to more than one CLO).**
- **Textbook and references should be updated.**