University of Sri Jayewardenepura

Department of Statistics

STA 114 2.0 Probability and Distribution Theory I

Course Outline

Type : Core

Duration: 30 lecture hours

Note: (But actual number of hours allocated in the master time table is 26.25 hours.

(105 min. per week * 15 weeks = 26.25 hrs))

Pre-requisites: None

Course objective:

To introduce the fundamentals of probability theory and basic principles of random variables and illustrate these concepts with engineering, medicine, business etc. applications.

Course contents:

1 ELEMENTS OF PROBABILITY

1.1 Introduction
- 1.1.1 Terminology

1.2 Events
- 1.2.1 Events as subsets of sample spaces
- 1.2.2 Random variables*
- 1.2.3 Events in terms of random variables*

1.3 Event operations
- 1.3.1 Complement
- 1.3.2 Intersection
- 1.3.3 Union

1.4 Axioms of probability

1.5 Interpretations of probability
- 1.5.1 Relative frequency interpretation
- 1.5.2 Subjective interpretation

1.6 Methods for determining probability
- 1.6.1 Classical method
- 1.6.2 Relative frequency method
- 1.6.3 Subjective method
- 1.6.4 Using probability models

Learning Outcomes:

At the end of this course, students should be able to:

- explain the meaning of technical terms
- state and prove probability rules and theorems
- write down events as subsets of sample spaces
- property define events related to problem
- write down complex events in terms of basic events
- calculate probability of events using probability rules
- interpret the probability
- identify random variables of interest in problems
- express events of interest in terms of random variables
- select suitable probability models for random variables
- Correctly use the notations introduced in class.
- calculate probabilities related to distributions
- use relationships between distributions in solving problems
- Solve the problems provided in class, answer the past papers available in the website of the department, and solve any other problem of similar nature that involves the course content.

Method of Assessment:

1. Mid Semester Examination - 20%
2. End of Semester Examination - 80%

Note: At least 80% attendance for lectures is required to sit for end semester examination

Reference Text books:

- Introduction to the Theory of Statistics
  Authors: Mood, A.M., Graybill, F. A., and Boes, D. Publisher: McGraw Hill
  ISBN-13: 978-0070854659

- Probability and Statistics for Engineering and the Sciences, Eighth Edition
  Author: Jay L. Devore Publisher: Brooks/ Cole, Cengage learning
  ISBN – 13: 978-0-538-73352-6

Lecturer in charge: Ms. T. S. Talagala