

 SLIIT <i>Discover Your Future</i>	DEPARTMENT OF INFORMATION TECHNOLOGY
	FACULTY OF COMPUTING

MODULE OUTLINE			
Module Name	Probability & Statistics		
Module Code	IT2110	Version No.	2017 - 0
Year	2	Semester	2
Credit Points	3		
Pre-requisites	IT1030		
Co-requisites	None		
Methods of Delivery	Lectures (Face-to-face)	2	Hours/Week
	Tutorials	1	Hours/Week
	Labs	2	Hours/Week
Course Web Site	http://courseweb.sliit.lk/		
Date of Original Approval	January, 2017		
Date of Next Review	January, 2022		

MODULE DESCRIPTION		
Introduction	<p>The objective of this unit is to provide an understanding of the theory behind descriptive statistics, inferential statistics, data analysis and interpretation of outputs obtained using statistical software.</p> <p>The basic theory covers distribution theory and statistical inference so that the outputs are easily understood. The practical sessions consists of performing different statistical techniques on different data using R software package.</p>	
Learning Outcomes	At the end of the module student will be able to:	
	LO1:	Describe the importance of statistics and probability in information technology.
	LO2:	Apply rules and statistical techniques to solve and analyze real world problems.

	LO3:	Use techniques of testing various hypotheses to arrive at various decisions.		
	LO4:	Undertake data analysis, explain and describe outputs of R package.		
	LO5:	Understand how to use statistical techniques for scientific forecasting.		
Assessment Criteria	During the semester, there will be one mid-term, lab tests, and a final exam. The mid-term test will be based on the practical work, the questions discussed in tutorial sessions, and lecture material covered until the week before it is held. The final examination will be a comprehensive exam based on the practical assignments and lecture materials covered during the semester.			
	Continuous Assessments			
	• Midterm Examination	30	%	LO1- LO2
	• Assignments	20	%	LO2- LO4
	End Semester Assessment			
	• Final Examination	50	%	LO1-LO5
	TOTAL	100	%	
Estimated Student Workload	Contact Hours			
	• Lecture	24 hours		
	• Tutorial	12 hours		
	• Laboratory	12 hours		
	Time Allocated for Assessments			
	• Continuous Assessments	11 hours		
	• Final Examination	03 hours		
	Reading and Independent Study		90 hours	
	TOTAL		152 hours	
Module Requirement	To pass this module, students need to obtain a pass mark in both “Continuous Assessments” and “End of the Semester Examination” components which would result in an overall mark that would qualify for a “C” grade or above			
Primary References	1. R. E. Walpole, R. H. Myers, S. L. Myera, K. Ye, <i>Probability and Statistics for Engineers and Scientists</i> , 9 th Edition, Prentice Hall, 2012			
	2. M. R. Spiegel & L.J. Stephens, <i>Schaum’s Outlines of Statistics</i> , 6 th Edition, McGraw-Hill Education, 2017			

CONTENTS OF THE MODULE

1. Introduction to Statistics

- Terminology
- Data and variables
- Areas and use of statistics

2. Sampling Methods

- Introduction
- Simple random sampling
- Stratified sampling
- Systematic sampling
- Cluster sampling
- Multistage sampling

3. Exploratory Data Analysis / Descriptive Statistics

- Graphical methods of describing variable
 - Bar charts/Pie charts
 - Histograms
 - Stem-and-leaf plots
 - Boxplots
- Summary measures
 - Mean/Median/Mode
 - Range/Variance/Standard Deviation
 - Percentiles/Quartiles

4. Probability

- Introduction to probability,
- Conditional Probability

5. Random Variables (R.V.s) and Probability Distributions

- Discrete probability distributions
- Expected value of a r.v.
- Variance of a r.v.
- Binomial distribution
- Poisson distribution

6. Continuous Probability Distributions

- Probability density function
- Exponential distribution
- Normal distribution

7. Sampling distributions

- Sampling distribution
- Central limit theorem

8. Statistical Inference

- Point estimation
- Interval estimation
- Hypothesis definition
- One population tests
- Two population tests
- Errors in hypothesis testing

9. Chi-squared Test

- Goodness-of-fit Test
- Test for homogeneity

10. Regression

- Scatter plot
- Linear correlation
- Regression models

11. Introduction to Time Series

- Additive and multiplicative time series models
- Seasonal variations
- Forecasting using time series

GENERIC INFORMATION

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-----End of Module Outline-----