

Statistical Data Analysis

Module Code:	COS7005-B
Academic Year:	2018-19
Credit Rating:	20
School:	Department of Computer Science
Subject Area:	Computer Science
FHEQ Level:	FHEQ Level 7 (Masters)
Module Leader:	Dr Attila Csenki

Additional Tutors:

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	24
Laboratory	24
Directed Study	150

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 2 (Feb - May)

Module Aims

To acquire knowledge of statistical data analysis, statistical learning methods and data analytics techniques for the hypotheses generation and hypotheses testing, in order for making appropriate statements/predictions.

Outline Syllabus

This module covers the techniques and methods concerning the data analytics, model generation and prediction for a wide range of applications:

- (1) Statistical method for data characteristics;
- (2) Model generation: applying statistical method for data analytics including (a) hypothesis generation, e.g. linear models, nearest neighbour methods, function approximation, and (b) statistical hypothesis testing such as parametric and nonparametric methods; bivariate techniques including contingency tables, correlation and regression; multivariate procedures including multiple regression, logistic regression and discrimination techniques;
- (3) Decision and prediction: applying statistical learning and data-driven modelling approach to infer new knowledge and probabilistic model from the models generated, including Bayesian decision theory, classification and clustering.

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1
 - (a) Critically assess the scientific as well as the practical value of data;
 - (b) Apply statistical hypothesis testing, statistical learning, and statistical modelling appropriately for the analysis of data;
 - (c) Gain practical understanding and knowledge of how established procedures are used to make inferences in a disciplined manner.
- 2
 - (a) Apply the procedures from data collection, modelling and turn it into information;
 - (b) Identify relationships (model generation, using statistical learning techniques) between different data variables;
 - (c) Provide appropriate models for predictive analysis.
- 3
 - (a) To gain confidence handling quantitative and qualitative information within a random and uncertain environment;
 - (b) Write technical reports as appropriate; work in groups to plan complex work and achieve organisational objectives; use appropriate sources to search for, retrieve, and organise information;
 - (c) Identify relevant sources of information; undertake search evaluation and selection of information. Identify appropriate methods of achieving high quality outcomes.

Learning, Teaching and Assessment Strategy

A number of lectures, laboratory practices will provide essential theoretical knowledge, and practical skill. Practical examples will be provided to aid the learning. Laboratory/tutorial sessions will be used to practice the techniques taught. Usage of appropriate languages/packages will be entertained.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	Examination - closed book	2 hours	50%	Yes

Summative	Coursework	A report discussing the analysis of given dataset	0-3000 words	50%	No
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Legacy Code (if applicable)

CM-0428D

Reading List

To view Reading List, please go to [rebus:list](#).