

COURSE SPECIFICATION DOCUMENT

Academic School/Department:	Richmond Business School
Programme:	Economics Finance and Investment
FHEQ Level:	5
Course Title:	Probability & Statistics II
Course Code:	MTH 5120
Student Engagement Hours:	120
Lectures:	30
Projects / Tutorials:	15
Independent / Guided Learning:	75
Credits Points:	12 UK CATS Credits 6 ECTS Credits 3 US Credits

Course Description:

This Course is a continuation of MTH4120 and is concerned with inferential statistics. It covers sampling distributions, interval estimations and estimating confidence intervals for populations and proportions, hypothesis and significance testing, goodness-of-fit test and Chi-square test, one-way analysis of variance (ANOVA), applications of non-parametric statistics and linear regression analysis. All practical work will be done on SPSS statistical software.

Prerequisites: MTH 4120

Aims and Objectives:

This Course aims to provide students with understanding and application of sampling distributions, estimation and hypothesis testing methods, primarily in business, economics and psychology. and practical interpretations of statistical outputs from SPSS software in a manner that is understandable, relevant and using the correct statistical language.

Programme Outcomes:

Economics: A2, A5, B3, D

Finance and Investment: A2, A4, B4, D2, D3, D5

A detailed list of the programme outcomes is found in the Programme Specification. This is maintained by Registry and located at:

<https://www.richmond.ac.uk/programme-and-course-specifications/>

Learning Outcomes:

- Understand the difference between descriptive and inferential statistics and be able to apply a wide range of techniques that involve sampling distributions, interval estimations and confidence intervals for population and proportion data.
- Demonstrate a detailed knowledge of well established statistical theories and concepts and their applications in practical problems that involve using statistical tables to perform hypothesis testing, interval estimations, analysis of variance, linear regression and non- parametric methods.
- Identify suitable method of statistical analyses required for different types of data and be able to perform the required analysis either on paper or by use of suitable statistical Software package such as SPSS and to interpret the output obtained in a manner that demonstrates a thorough understanding of statistical concepts.
- Be able to explore data statistically and identify patterns and relationships in data, and to use statistical models to judge the relevance and significance of data being investigated and also identifying the limitations of the method of enquiry.
- Be able to select appropriate techniques/criteria for evaluating data in a given problem and discriminate from competing methodologies the best method to use and for what data.

Indicative Content:

- Sampling distributions of sample statistics.
- Point and interval estimations of population means and proportions.
- Hypothesis and significance testing about the mean and proportion for one and two populations.
- Chi-square tests to cover goodness-of-fit test, test of independence, test of homogeneity and interpretation of test results from analyses using statistical software.
- One-way analysis of variance (ANOVA) to test homogeneity of means of at least three populations, and interpretation of ANOVA test results from analyses using statistical software.
- Linear regression to estimate least square line and test significance of estimated parameters to draw relevant conclusions on nature of estimated model, and interpretation of linear regression output from analysis using a statistical software.
- Non-parametric methods and related tests.

Assessment:

This course conforms to the University Assessment Norms approved at Academic Board and located at: <https://www.richmond.ac.uk/university-policies/>

Teaching Methodology:

The Course is delivered through interactive learning sessions using PowerPoint slides, computer activities, tutorial work, small group formative assessments and individual/group mini projects. Timely feedback and feedforward will be provided to enhance students' learning.

Bibliography:**IndicativeText(s):**

P. S. Mann, "Introductory Statistics", 9th edition, Wiley,

Recommended reading:

- A. Bryman, "Quantitative Data Analysis with IBM SPSS 17, 18 & 19", Routledge, 2011
- S. Lipschutz & J. J. Schiller, "Introduction to probability and statistics", McGraw Hill, 2012
- D.G. Rees, "Essential Statistics", 4th edition, Chapman & Hall/CRC, 2001
- M. Sheldon, "Introductory statistics", 4th edition, Elsevier/AP, 2017
- R. Sheldon, "A first course in probability", 9th edition, Publisher: Boston Pearson, 2014
- Murray R. Spiegel, et al, "Probability and statistics", 4th edition, McGraw-Hill, 2013
- N. A. Weiss, "Introductory statistics", 7th edition, Addison-Wesley, 2004

Journals

Journal of Royal Statistical
Society
Journal of Biometric
Society
Journal of the American Statistical
Association
Journal of Applied Statistics

Web Sites

Royal Statistical
Society
<http://www.rss.org.uk/site/cms/contentCategoryView.asp?category=90>

American Statistical
Association
<http://www.amstat.org/>

SPSS tutorials, IBM corporation,
<https://www.spss-tutorials.com/basics/>, sited July 2019 [also available on the University network under licence]

Please Note: The core and the reference texts will be reviewed at the time of designing the semester syllabus

Change Log for this CSD:

Nature of Change	Date Approved & Approval Body (School or LTPC)	Change Actioned by Academic Registry
Reading List	September 2019	
Revision – annual update	May 2023	