

BNM818 STATISTICAL AND ECONOMETRIC METHODS

Academic Year 2013/14

Number of Aston Credits: 15

Number of ECTS Credits: 7.5

Staff Member Responsible for the Module:

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at: <http://tinyurl.com/LeonidasOfficeHours>

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Pre-requisites for the Module:

None

Mode of Attendance:

On Campus

Module Objectives and Learning Outcomes:

- > To enable the student to identify the appropriate type of statistical and econometric analyses needed for various decision making contexts and to carry out such analyses;
- > To enable the student to understand the approach of statistics to economics so s/he can develop her/his own learning in the area beyond the topics covered by the course.
- > The student should be able to use ad hoc packages to carry out a basic regression analysis of a set of data.
- > Understand the differences between parametric and non-parametric hypothesis tests as well as learn the steps needed to carry out these tests.

- > Use probability and statistical models to make inferences about populations from samples.

Module Content:

- Week 1:** Descriptive statistics (measures of central tendency and dispersion). Introduction to probability theory.
- Week 2:** Discrete and Continuous probability distributions (Binomial, Poisson and Normal distribution).
- Week 3:** Inferential statistics including sampling distributions and confidence intervals.
- Week 4:** Parametric hypothesis tests.
- Week 5:** Non-parametric hypothesis tests
- Week 6:** Bivariate linear regression
- Week 7:** Multiple linear regression
- Week 8:** Introduction to panel data models and time series forecasting
- Week 9:** Revision
- Week 10:** Examination

Corporate Connections:

Where possible, examples are used from a company context. The coursework is drawn from real world applications and the students are required to perform and present their analysis within the business context.

International Dimensions:

The course material is virtually exclusively technical but where applications of the methods are concerned examples will be drawn internationally.

Contribution of Research:

The techniques presented in this module are widely used in academic research. Where possible, examples will be given of applications published in journal articles. In addition, new theoretical developments coming from the lecturers' own research agenda will be presented to complement and increase students' awareness but will not be considered for assessment purposes.

Ethics, Responsibility & Sustainability:

The importance of ethics, corporate social responsibility and sustainability in today's business world has grown exponentially. These themes apply in a very special way to the area of business analysis. As an applied scientist using techniques and methodologies for providing support in decision making process, an operational research analyst carries a significant amount of responsibility in appropriately including these important themes within the mathematical models created. We will in particular look at how the issue of diversity can be considered in data modeling as well as identify the importance of ethics in data modeling.

Method of Teaching:

- > 1.25 hour lecture per week, followed by 0.5 hour break, followed by 1.25 hour tutorial/consolidation/statistical lab session as appropriate.
- > The SPSS and Excel packages will be used in the practical sessions. It is essential that students attend both lectures and practicals in order to understand the subject.
- > Handouts will be provided at lecture as well as the computer instructions where appropriate to create a dynamic learning environment with student hands-on participation in the application of concepts covered.

Method of Assessment and Feedback:

The module is assessed 40% by individual assignment and 60% by examination. In the assignment you will act as a consultant in a data analysis firm required to produce a professional report for a complex business case using appropriate statistical and modelling techniques. The aim of the coursework is to enhance students' understanding on how the taught topics link to real world business cases as well as ensure that the students possess a good understanding of the topics. Feedback will be provided in two stages. First around the middle of term where students will have the opportunity to meet the tutor face to face and discuss any issues, concerns regarding their progress and at the end via the returned feedback sheets. With regard to the exams the students will be required to answer questions which will assess the students' knowledge on the module's topics as those highlighted in the module's learning outcomes and taught in the lectures.

Learning Hours:

These should be roughly along the lines indicated below:

Pre-reading	17
Contact Hours	23
Directed Learning (within the contact hours)	13
Private Study/Coursework	50
Examination Preparation	47
Total	150

The following readings are subject to change. Students should not therefore purchase textbooks prior to commencing their course. If students wish to undertake background reading before starting the course, many of the chapters/readings are available in electronic form via on-line library catalogues and other resources

Pre-reading:

No pre-reading material is necessary for the topics covered in the module however the students are advised to revise the indicated chapter in the following textbooks since they will help them with the module's coursework and lab sessions. All recommended textbooks are available as e-books through the Aston University Library <<http://www1.aston.ac.uk/library>>.

Smith, Pauline (2009). *How to write an assignment: proven techniques from a chief examiner that really get results*. 7th ed. [e-book] Oxford: How to Books. Chapters: 3 – 7.

Griffith, Arthur (2010). *SPSS for dummies*. 2nd ed. [e-book] Hoboken, N.J.: Wiley Publishing, Inc. Chapters: 1, 3, 9 – 11.

Schmuller, Joseph (2009). *Statistical Analysis with Excel for dummies*. 2nd ed. [e-book] Hoboken, N.J.: Wiley Publishing, Inc. Chapter: 3.

Essential Reading:

Anderson, D.R., Sweeney, D.J., Williams, T.A., Freeman, J. and Shoesmith, E. (2010). *Statistics for Business and Economics*. 2nd Ed. UK: South-Western, Cengage Learning.

Indicative Bibliography:

Bradley, T. (2007) *Essential Statistics for Economics, Business and Management*. Chichester, UK: John Wiley & Sons.



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Moore, D.S., McCabe, G.P., Alwan, L.C., Craig, B.A. and Duckworth, W.M. (2011). *The Practice of Statistics for Business and Economics*. 3rd Ed. New York, USA: W.H. Freeman and Palgrave MacMillan.

Wooldridge, J.M. (2013). *Introductory Econometrics: A Modern Approach*. 5th ed. Canada: South-Western, Cengage Learning,



For further information on any of the opportunities that Aston Business School offers, please contact:

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