

Course Title: **ADVANCED QUANTITATIVE ISSUES AND METHODS (AQIM)**
Course Co-ordinator: Gwilym Pryce
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Location: Department of Urban Studies, 27 Bute Gardens

Course Delivery: The course comprises of 18 sessions over a three-year rolling cycle.

Semester: Usually run as half day blocks in 3rd Semester/Term.

Times and Location of Lessons: **First Session (Block 1)**
9am - 1.30pm on Wed, 7 June 06 in Room T316, Adam Smith Building.

Others - TBC

Aims:

The purpose of the course is to provide a framework for supporting students in the use of quantitative methods in years two, three and four of their PhD. There is clearly a need to consolidate the skills and techniques learnt in Quantitative Methods training provided in the first year of the 1+3 programme, skills that are quickly lost if not in frequent use.

The course aims to:

- a. develop students' knowledge of a number of advanced quantitative techniques appropriate to postgraduate research in social science.
- b. supplement and enhance the continued support currently provided by supervisors and informal advice offered by the Faculty Methodologist.
- c. provide a framework for training in advanced quantitative techniques above and beyond those provided in Quantitative Methods Modules I & II.
- d. help students learn how to articulate quantitative issues. The language of statistics can be arcane. It is one thing to understand a statistics lecture, it's another to discuss or write about statistics in one's own words. Yet this is what PhD students are required to do when they write up their thesis and defend it to an external examiner. By encouraging students to participate in discussions of statistical issues and methods on a regular basis we hope to greatly increase their capacity to articulate and critically evaluate quantitative methods.
- e. encourage innovation in the application of quantitative methods, facilitate the dissemination of new research ideas and raise the level of enthusiasm for using quantitative methods.

Learning Outcomes:

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

- a. understand and explain intuitively the statistical theory behind the advanced techniques taught on the course;
- b. know the properties and limitations of those techniques;
- c. know when, and when not to, apply those techniques;
- d. understand the practical steps involved in implementing those techniques;
- e. know which statistical software package(s) are most appropriate for the application of those techniques and the associated basic syntax (if any);
- f. discuss and ask questions about statistical issues and appreciate the benefit of discussing statistical problems with peers;
- g. work effectively with others to solve statistical problems;
- h. critically analyze statistical methods and applications;
- i. further extend their knowledge of statistics and find answers to particular statistical questions by being able to:
 - (i) effectively search for additional statistical information,
 - (ii) know who, how and when to ask advice; and
 - (iii) know how to obtain additional training.
- j. attempt innovation in the application of statistical techniques by appreciating the benefits and means of:
 - (i) spotting opportunities for applying existing techniques in new ways,
 - (ii) combining more than one technique or data in an innovative way,
 - (iii) drawing on expertise and techniques from other disciplines,
 - (iv) spotting opportunities for gathering new data or combining data in innovative ways,
 - (v) thinking creatively about research methodology.

Assessment:

There is no formal assessment, as this course is not credit bearing. However, a student will receive an *AQIM Certificate* if he/she:

- attends all eight taught sessions and at least eight of the others over three years, and
- by the end of the three years, completes a 1,000 reflective essay describing how they have applied a particular quantitative method in their research demonstrating awareness of limitations and alternative interpretation (plus output and syntax appendices as evidence of work done).

Teaching Staff:

The course is taught and co-ordinated by Dr Gwilym Pryce. Student participation is expected to be a key feature of the course. Guest lecturers will be utilised as required.

Course Summary:

The course comprises of 18 sessions over a three-year rolling cycle. Though there will be a degree of flexibility, it is anticipated that each 3 year cycle will comprise:

- 8 *Taught* sessions (i.e. lectures),
- 6 *Problem Led* sessions (i.e. tutorials), and
- 4 *Innovation Led* sessions (i.e. tutorials – see below).

Taught Topics:

Examples of possible Taught Topics include the following (selected on the basis of the most common previous requests from PhD students which are not covered in existing Graduate School courses):

- Simultaneous equations (2SLS)
- Maps, GIS and spatial regression analysis
- Time-to-event modeling (also known as "Duration" or "Survival" analysis)
- Cluster Analysis
- Factor Analysis
- Introduction to using Stata
- Introduction to using Matlab
- Sample selection bias ("Heckman Correction")
- Ordered and multinomial logit
- Introduction to Time series analysis

Problem Led Sessions:

PhD Students and/or research staff will be encouraged to bring specific research questions and problems to the table. The group can then bring their collective knowledge to bear on the problem.

Innovation Led Sessions:

The workshops will also provide a forum for students and staff to present innovations in methods, either that they themselves have developed, or that they have recently become aware of.

Virtual Discussion Board:

A virtual forum will be set up which will allow students and staff to raise questions and voice ideas related to applied quantitative issues and methods.

Learning Methods used and total notional learning hours:

<i>Learning Methods</i>	<i>Notional Learning Hours</i>
Private study	60
Reflective essay	10

Recommended Reading:

Long, J. S.(1997) "*Regression models for Categorical and Limited Dependent Variables*", Sage: Thousand Oaks California.

Andy Field (2005) "Discovering statistics using SPSS for Windows : advanced techniques for the beginner", 2nd Edition, Sage: London.

Peter Kennedy (1994) A Guide to Econometrics (Cambridge, MA: MIT Press).

Bartholomew, D.J., Steele, F., Moustaki, I., and Galbraith, J.I. (2000) *The Analysis and Interpretation of Multivariate Data for Social Scientists*, Texts in Statistical Science, Chapman and Hall/CRC: Florida.