Lancaster University
Faculty of Science and Technology
Department of Mathematics and Statistics

APPLIED SOCIAL STATISTICS

POSTGRADUATE DEGREE COURSE PROGRAMME
2009 – 2010

CONTENTS

1 Introduction

This booklet contains details of the MSc/MRes in Applied Social Statistics. It outlines the modules available to postgraduate students within these degree schemes. The booklet also provides other information about assessment procedures, guidelines for preparing dissertations and other departmental policies. For any other information contact the Course Director, Dr. Juliet Harman.

1.1 The Department

The Department of Mathematics and Statistics is made up of the sections of Statistics, Medical Statistics, Applied Statistics and Pure Mathematics. The Statistics group at Lancaster forms one of the strongest statistical research groups in the UK.

In recognition of teaching excellence, in 2005 the Department was awarded a large grant by the Higher Education Funding Council for England to fund a *Centre of Excellence in Teaching and Learning* (CETL) which specialises in postgraduate statistics.

A new state-of-the-art building, the Postgraduate Statistics Centre, was opened in February 2008, providing excellent teaching facilities and attractive spaces where postgraduate students and staff can interact. MSc students have their own base-room and social area in this new building.

The Department of Mathematics and Statistics is located in the Postgraduate Statistics Centre and on B floor of Fylde College, to which it is connected by a linking bridge.

1.2 Admission requirements

Candidates would normally hold at least an upper second class honours degree in a social science subject, science, mathematics or statistics, or other relevant discipline from a British University or CNAA; a comparable degree from a university or recognised degree awarding body in another country, or a relevant professional qualification or experience at an equivalent level.

A background of at least ‘A level’ mathematics or equivalent is an advantage.

1.3 Course Office

Enquiries about admission, and for current students about the day-to-day running of the course, should be addressed to Angela Mercer in the course office (B78, Postgraduate Statistics Centre) or by email to a.j.mercer@lancaster.ac.uk.

1.4 Staff

Director of Postgraduate Studies

Dr Gillian Lancaster

Course Director

Dr Juliet Harman

Postgraduate Administrator / MSc Secretary

Angela Mercer

Lecturing Staff:

Dr Damon Berridge
Dr Debbie Costain
Dr Emma Eastoe
Prof Brian Francis
Dr Juliet Harman
Dr Leslie Humphreys
Dr Gillian Lancaster
Dr David Lucy
Prof Roger Penn
Dr Svetlana Tishkovskaya
Dr Andrew Titman

Tutorial Staff:

Dr Ruth Allen

Visiting Lecturers:

Karen Baird
Dr Michael Green

MSc/MRes in Applied Social Statistics

2.1 Aims and Objectives

2.1.1 Aims

The MSc/MRes in Applied Social Statistics is designed to provide students with a firm grounding in the joint roles of substantive theory, data collection and statistical analysis. Students are encouraged to explore ways in which this knowledge can be applied to study economic, sociological and management issues. The policy implications of quantitative social science research will be considered throughout the course. Given staff expertise in social statistics and its application in substantive fields, Lancaster University is ideally placed to provide such a course.

2.1.2 Learning and Assessment Objectives

- **Knowledge and understanding**

  By the end of the course, students should have acquired:

  a) advanced knowledge of the interdependent roles of substantive theory, methods of data collection and statistical methods of analysing data,

  b) a thorough understanding of problems inherent in designing, executing and evaluating research projects and published work.

  These will have been acquired via:

  a) direct transmission in classes,
  b) discussion with tutors and peers,
  c) independent study,
  d) direct practical experience.

  Assessment will have been based on a dissertation (an original investigation supervised by an expert on the topic) and on coursework relating to the taught modules (ranging from assignments involving traditional essays to the writing up of practical work and other exercises).

- **Skills and other attributes**

  Students will have gained essential practical skills associated with conducting social statistical research, including:

  a) research design, data analysis, modelling and interpretation,
  b) using a range of software,

c) synthesising information from a variety of sources,
d) oral and written presentation skills.

Students will have been encouraged to relate their work and interests to those of researchers from the increasingly interwoven areas of education, health, industry, social services, criminal justice, market research, housing and ethnic relations. They will also have developed skills of scientific reasoning and analysis, and transferable skills of communication. The dissertation will have provided the opportunity to consolidate these through experience of the research process. The range of skills will have been assessed through judgement of students' written work and oral presentations.

2.2 Structure of MSc in Applied Social Statistics

The programme consists of two sets of modules (Part 1 and Part 2) followed by a dissertation. A number of core modules are compulsory**,** but students are also able to choose from some optional modules, thereby allowing them to tailor their training programmes according to their own requirements and research interests. (Total 180 credits.)

Substantive and methodology modules

These modules cover the main methods of data collection, fundamental aspects of research design, and statistical methods of data analysis. Included are Methodological Debates in the Social Sciences and Applied Social Science Research – An Integration, which are pivotal in the sense that they explain how and why the other modules come together to form a coherent whole.

Practical skills module

This optional module provides students with the range of skills necessary for applied statistical work, including team working, oral presentation, statistical consultancy and the preparation of written reports of various kinds.

Software modules

Non-credit-bearing software-based modules are available to supplement the substantive and methodology modules, some of which require knowledge of particular software packages. The module on the R software package is compulsory.

Support modules

In addition, learning resources and materials are available on-line or as taught support modules for training in the fundamentals of mathematics and statistics.

Part 1 Modules (50 credits plus optional 10 credits)

Compulsory Substantive Modules:

Methodological Debates in the Social Sciences *(10 credits)*
Sampling Design *(5 credits)*
Questionnaire Design *(5 credits)*
Secondary Data Analysis *(5 credits)*

Compulsory Methodological Modules:

Statistical Inference *(15 credits)*
Generalized Linear Models *(10 credits)*

Optional Practical skills module:
Statistics in Practice *(10 credits)*

Optional Support Modules:

Mathematics for Statistics *(non-credit)*
Statistical Methods *(non-credit)*

Part 2 Modules (50 credits plus optional 10 or 20 credits)

Compulsory Substantive Modules:

Applied Social Science Research – An Integration *(10 credits)*

Compulsory Methodological Modules:

Duration Analysis *(10 credits)*
Multi-Level Models *(10 credits)*
Methods for Missing Data *(10 credits)*
Bayesian Methods *(10 credits)*

Optional Methodological Modules (choose **2**; or **1** + Statistics in Practice)

Event History Analysis *(10 credits) [not available 2009/10]*
Data Mining *(10 credits)*
Structural Equation Modelling *(10 credits)*

Part 3 Dissertation (60 credits)

Following successful completion of Parts 1 and 2, MSc students conduct an original piece of research with subsequent submission of a dissertation of 50 pages maximum, based on empirical work undertaken in an applied area of social statistics.

Students who do not complete the MSc programme may be eligible for an alternative qualification. Students who receive 120 credits from the taught

courses will be eligible for the Postgraduate Diploma in Applied Social Statistics.

2.3 Software Modules

The module on the software package R is compulsory. R is used in some of the compulsory methodological modules and is assessed through these modules.

Other optional non-credit software-based modules are available. These supplement the substantive and methodology modules within the MSc in Applied Social Statistics, some of which require knowledge of particular software packages.

Currently available optional modules:

Atlas.ti

SPSS for Windows: I

SPSS for Windows: II

STATA

3 MRes (Integrated PhD) in Applied Social Statistics

The MRes follows the MSc programme, with the addition of two extra modules (total 200 credits).

3.1 Scheme of study for MRes

Part 1 Modules (50 credits plus optional 10 credits)

Students will take the following compulsory modules:

Methodological Debates in the Social Sciences (10 credits)
Statistical Inference (15 credits)
Generalized Linear Models (10 credits)
Sampling Design (5 credits)
Questionnaire Design (5 credits)
Secondary Data Analysis (5 credits)

Optional Practical skills module:
Statistics in Practice *(10 credits)*

Part 2 Modules (70 credits plus optional 10 or 20 credits)

Students will take seven compulsory and one or two optional modules:

Compulsory modules:

Applied Social Science Research – An Integration (10 credits)
Bayesian Methods (10 credits)
Multi-level Models (10 credits)
Duration Analysis (10 credits)
Methods for Missing Data (10 credits)
Techniques of Social Research (10 credits)
Textual Analysis (10 credits)

Optional modules (choose **2**; or choose **1** and Statistics in Practice):

Event History Analysis (10 credits) *[not available 2009/10]*
Data Mining Techniques (10 credits)
Structural Equation Modelling (10 credits)

By agreement with the scheme director, students may replace one or more optional modules with appropriate modules provided by another department, provided the topic is related to the proposed PhD or provides generic research training. Students will be given the opportunity to attend the CiLTHE programme as an additional non-credit-bearing enhancement to the scheme.

In addition, students may be expected to attend external advanced courses in statistics which are given as part of the national Graduate Training Programme in Statistics organised by the Royal Statistical Society. There is no formal assessment of these courses.

Dissertation (60 credits)

MRes students conduct an original piece of empirical research during the summer period with subsequent submission of a dissertation of 50 pages maximum. This should demonstrate an understanding and proper application of advanced techniques in an area of applied social statistics, preferably with the potential to be developed into PhD research.

3.2 Software modules and other non-credit-bearing modules

Non-credit-bearing software-based modules are available to supplement the substantive and methodology modules. Currently available software modules are listed in Section 2.3.

The modules on the software packages R and Atlas.ti are compulsory for MRes students. R is used in some of the methodological modules and is assessed through these modules. Atlas.ti is a prerequisite for the Textual Analysis module.

Optional Support Modules for training in the fundamentals of mathematics and statistics are:

Mathematics for Statistics *(non-credit)*
Statistical Methods *(non-credit)*

3.3 Assessment and Progression

Year 1

An MRes will be awarded at the end of Year 1 if the weighted mean module mark is over 50% (with no individual mark below 40%) and at least 50% in the dissertation. Also see section 5.5.

To continue into Year 2 and study towards a PhD, students should have a weighted mean mark above 60% over all Year 1 modules and dissertation, and have no individual mark below 50%.

Years 2, 3 and 4

The PhD project will be reviewed by a supervisory panel and satisfactory performance will be needed for progression. The PhD will be examined in the usual way and satisfy the normal criteria for the award.

More information about PhD regulations can be found at:
http://www.lancs.ac.uk/users/gradschool/regulations.htm

4 Element Descriptions

4.1 Part 1 Modules

4.1.1 CFAS401 Methodological Debates in the Social Sciences

Lecturers: **Professor Roger Penn & Dr Damon Berridge**

Prerequisite: **Statistical Inference (or equivalent)**

Contact hours and type: **7.5 hrs lectures/seminars**

Outline: This module introduces students to the principles and practice of applied quantitative social science. It outlines the stages involved in the design of several collaborative multi-disciplinary research projects undertaken at Lancaster over recent years (including EFFNATIS and the LFRS Research) and emphasizes the importance of issues of analysis in the design process, in particular the choice of an appropriate statistical model.

The module deals with the principles behind classic experimental design and outlines the reasons why this is rarely used in most contemporary social scientific research. The underlying issue of 'control', possible within a statistical modelling framework, nonetheless does remain a central principle in non-experimental research designs.

Assessment: Students will apply their knowledge of principles and practice in relation to a substantive empirical issue in the social sciences in order to devise a statistical modelling strategy.

Bibliography:

Agresti, A (2002) *Categorical Data Analysis* [2nd edition]

Bryman, A (2004) *Social Research Methods* [2nd edition]

Newman, W (2006) *Social Research Methods* [6th edition]

R.B.Davies, P.Elias and R.Penn
'The Relationship between a Husband's Unemployment and his Wife's Participation in the Labour Force', in D. Gallie, C. Marsh and C. Vogler (eds), *Social Change and the Experience of Unemployment*

A.J.Dobson *An Introduction to Generalized Linear Models'* (2nd ed.), Boca Raton : Chapman & Hall/CRC, 2001.

R.Penn and B.Francis 'Towards a Phenomenology of Skill in R. Penn et al (eds), *Skill and Occupational Change*, Oxford : Oxford University Press, 1994, pp.223-243.

4.1.2 CFAS402a Sampling Design

Lecturers:	**Dr Damon Berridge & Professor Roger Penn**
Prerequisites:	**Statistical Inference**
Contact hours and type:	**5.5 hrs lecture/tutorial + 2 hrs practical**

Outline: The main aim of this module is to give a solid foundation to the understanding of sampling and sampling methods. Various methods of survey sampling will be considered and practical examples given throughout the module.

Topics covered will include:

- Basic ideas of sampling
- Sampling designs
- Sample size determination and sampling frames
- Experiments and investigations
- Ways of collecting information

Learning: Students will learn through the application of concepts and techniques covered in the module by application to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Students will acquire a knowledge of:

- The basic principles of sampling
- Different types of sampling designs and which is appropriate to use in a particular circumstance
- Methods of collecting information

Assessment: An assignment covering all aspects of the module material.

Bibliography:

Barnett, V. (2002) *Sample Survey: Principles and Methods* Hodder Arnold

Kish, L.(1995) *Survey Sampling* . Wiley Classics Library.

Lohr, S (1999) *Sampling: Design and Analysis*

Moser C.A., Kalton G., *Survey Methods in Social Investigation*

4.1.3 CFAS402b Questionnaire Design

Lecturers:	**Professor Roger Penn & Dr. Damon Berridge**
Prerequisites:	**none**
Contact hours and type:	**7.5 hrs lecture/discussion practical**

Outline: This module will provide students with the tools required to design questionnaires in an efficient and effective manner. There will be ample opportunity for students to discuss their own research interests and design their own questionnaires.

Topics covered will include: useful resources, including the Question Bank; examples of current widely used questionnaires in the social sciences (such as BHPS, SCELI, EFFNATIS); examples of good and bad practice; interview schedule vs. self-completion form; structured vs. semi-structured instruments; types of questions and responses; wording of questions; routing, branching and funnel sequences; questionnaires for use in longitudinal surveys; designing web-based questionnaires; entering data, and defining and using rules.

Learning: Students will learn through the practical application of the techniques covered in the module. Students will be encouraged to participate and share their experiences in group exercises.

Knowledge and Understanding:

By the end of the module students will:

1. Be familiar with a range of useful resources, including the Question Bank
2. Have an increased understanding of types of questions and responses and of the wording of questions
3. Be familiar with routing, branching and funnel sequences
4. Have increased competence in the design of questionnaires in a number of formats

Assessment will involve the design and piloting of a short questionnaire and an evaluation of its strengths and weaknesses.

Bibliography:

Fink, A. et al. 1995. *The Survey Kit*. Sage.
Foddy, W. 1994. *Constructing questions for interviews and questionnaires: theory and practice in social research*. Cambridge University Press.
Houtkoop-Steenstra, H. 2000. *Interaction and the standardised survey interview: the living questionnaire*. Cambridge University Press.
Moser, C. & Kalton, G. 1979. *Survey methods in social investigations*. Heinemann.
Oppenheim, A.N. 1992. *Questionnaire design, interviewing and attitude measurement*. Pinter.
Rossi, P.H., Wright, J.D. & Anderson, A.B. 1983. *Handbook of Survey Research*. Academic Press.
Schuman, H. & Presser, S. 1981 *Questions and answers in attitude surveys: experiments on question form, wording and context*. Academic Press.
Wilson, N. & McClean, S. 1994. *Questionnaire Design: A Practical Introduction*. University of Ulster.

4.1.4 CFAS403 Secondary Data Analysis

Lecturer:	**Dr Leslie Humphreys**
Prerequisites:	**Methodological Debates in the Social Sciences; SPSS for Windows: I (or equivalent)**
Contact hours and type:	**5 hrs lecture/demonstration + 2.5 hrs practical**

Outline: This module introduces the skills and techniques involved in sourcing and analysing secondary data. The module consists of two parts. The first part is concerned with using the internet to discover secondary data sources and other material both in the UK and in other countries, and in finding both quantitative resources for research. The major British social surveys will be covered. Online access to the UK census data will also be demonstrated.

The second part of the module explores in detail two publicly available datasets, the Home Office Offenders Index birth cohort series and the ESRC British Household Panel survey. The module will show methods of merging and aggregating datasets to produce information sources suitable for secondary analysis. Problems of data quality will also be addressed.

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will:

1. be familiar with the major sites for information on secondary data sources in the UK
2. understand how to search for data at the ESRC data archive
3. be aware of how to obtain UK Census data
4. be able to download data and follow data documentation
5. be able to construct data subsets by merging and aggregating data files from a major social science dataset using SPSS
6. be aware of data quality issues in secondary data
7. gain experience of using a simple GIS system for displaying spatial data.
8. Learn how to aggregate and merge and transform datasets to convert complex secondary datasets to those ready for statistical analysis

Assessment: By coursework, addressing a relevant social issue by extracting data from the BHPS and providing a suitable data analysis.

Bibliography:

Marc Riedel, *Research Strategies for Secondary Data*, Sage.
Angela Dale, Sara Arber and Michael Procter, *Doing secondary analysis*. London : Unwin Hyman
Catherine Hakim, *Secondary analysis in social research: a guide to data sources and with examples*. London : Allen & Unwin
Jill Kiecolt and Laura Nathan, *Secondary analysis of survey data*, Sage.

4.1.5 CFAS404 Mathematics for Statistics (non-credit)

Lecturers:	**Dr David Lucy & Dr Svetlana Tishkovskaya**
Prerequisites:	**none**
Contact hours:	**10 hrs**

Outline: This module is an introduction to the basic (and not so basic) mathematics needed in the Statistics World. The module will revise some topics covered in the A-level syllabus, and then introduce other topics students need to grasp in order to cope with the statistics used in this degree.

Therefore this module is intended for those people having only a GCSE in Mathematics, but who need to gain knowledge of material covered at A-level, such as Calculus, Matrices and Probability.

The following topics will be covered:

1. Sets, Permutations, Combinations and Probability
2. Mappings and Functions
3. Equations
4. Vectors and Matrices
5. Calculus

Learning: Students will self teach the concepts by going through the web based material, and then through the exercises and answers. If problems arise, the tutor will be accessible via e-mail.

Successful students will:

1. be able to cope with the Mathematics needed in the other courses
2. be familiar with calculus.
3. know how to manipulate vectors and matrices
4. know how to work out probability

Bibliography:

Pearson J.M., *Mathematics for Economists (A First Course)*
Jacques I., *Mathematics for Economics and Business*
Hagle T., *Basic Math For Social Scientists (Concepts)*
Croft A. and Davison R., *Foundation Maths (Prentice Hall)*

4.1.6 CFAS405 Statistical Methods (non-credit)

Lecturer:	**Dr. Emma Eastoe**
Prerequisites:	**Mathematics for Statistics (or equivalent)**
Contact hours and type:	**15 hrs (mix of lectures and tutorials)**

The aim of this module is to take the ideas of summary statistics and graphical presentations and develop the basic concepts of the theory of statistical methodology. These will include the treatment of common distributions, general properties of distributions and the development of the principles of statistical tests. These ideas will be illustrated by examples from the social sciences and related disciplines. Emphasis will be on the practical application of these ideas.

Students will acquire a knowledge of:

1 the basic principles of probability theory and statistical distributions
2. the concept of a sampling distribution
3. the principles of estimation and inference
4. the application of the methodology to the comparison of means and the application of least squares in linear regression

and develop skills to:

5. apply theoretical concepts
6. identify and solve problems

Topics covered will be:

Probability theory: discrete and continuous distributions, expectation and variance of a distribution; sampling distributions and parameter estimation; hypothesis tests: critical regions, p-values and confidence intervals; linear regression: ANOVA, least squares and interpretation; Pearson's chi-squared statistic.

Bibliography

Attwood, G., Skipworth, G. and Dyer, G. (2000) *Statistics 1 - 6*, Oxford:Heinemann/Edexcel (series of six books)

Daly F., Hand D.J., Jones M.C., Lunn A.D. and McConway K.J. (1995) *Elements of Statistics*, Addison Wesley.

Rice, J.A. (2007) *Mathematical Statistics and Data Analysis*, Duxbury

Upton G. and Cook I. (1996) *Understanding Statistics*, Oxford University Press

4.1.7 CFAS406 Statistical Inference

Lecturer: **Dr Emma Eastoe**

Prerequisites: **Statistical Methods**

Contact hours and type: **15 hrs (mix of lectures and tutorials)**

Outline: The main aim of this module is to give a solid foundation to the understanding of statistics as a general approach to the problem of making valid inferences about relationships using data from observational or experimental studies. Examples of analyses from the social sciences will be used to illustrate this approach. The emphasis will be on the principle of Likelihood as a unifying theory for the development of statistical analysis.

Topics covered will be:

Revision of probability theory and parametric statistical models
The properties of statistical hypothesis tests, statistical estimation and sampling distributions
Maximum Likelihood Estimation of model parameters
Asymptotic distributions of the maximum likelihood estimator and associated statistics for use in hypothesis testing
Application of likelihood inference to simple statistical analyses including linear regression and contingency tables

Learning: Students will learn through the application of concepts and techniques covered in the module by application to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Students will acquire a knowledge of:

1. the basic principles of probability theory
2. the properties of a statistical test
3. Maximum Likelihood as a theory for estimation and inference
4. the application of the methodology to hypothesis testing for model parameters, the analysis of contingency tables and linear regression

and develop skills to:

5. apply theoretical concepts
6. identify and solve problems

Assessment: One assignment covering all aspects of the module material.

Bibliography:

Dobson A.J., (1983) *An Introduction to Statistical Modelling*, Chapman and Hall

Eliason, S.R. (1993) *Maximum Likelihood Estimation : Logic and Practice*, Sage Publications

Pickles A., *An Introduction to Likelihood Analysis*, CATMOG series

Patiwan, Y,(2001) *In all Likelihood*, Oxford University Press, Oxford.

4.1.8 CFAS407 Generalized Linear Models

Lecturers:	**Professor Brian Francis & Dr Andrew Titman**
Prerequisites:	**Statistical Inference (or equivalent); experience in R**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical**

Outline: The aim of this module is to consider generalized linear models as a broad class of statistical models applying the general principles of likelihood inference to a variety of commonly encountered data analysis problems in the social sciences. The module will also introduce the software package R as tool for such statistical analysis.

Concepts introduced in the module *Statistical Inference* will be reviewed and extended to this broad class of models. The use of factors, covariates and their interactions to build a flexible class of relationships will be considered. Applications to the modelling of categorical and duration data will be described.

Topics covered will be:

An introduction to model fitting in the R software package. The general linear model. Logistic regression models for binary data. The generalized linear model. Log-linear models for multi-way contingency tables. An introduction to the analysis of duration data.

Learning:

Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be able to:

1. carry out advanced statistical procedures
2. identify the appropriate procedure for a particular substantive issue
3. apply theoretical concepts
4. identify and solve problems
5. analyse data and interpret statistical output
6. apply strategies for appropriate selection of information

Assessment: A series of short assignments covering all aspects of the module material plus a larger assignment (50%) that will test the student's ability to select the appropriate statistical techniques to address a substantive issue.

Bibliography:

Agresti A., *Analysis of Categorical Data*, Wiley, New York
Aitkin M.A., Anderson D.A., Francis B.J. and Hinde J.P*., Statistical Modelling in GLIM*, OUP
Dobson A., *An Introduction to Generalized Linear Models*, Chapman and Hall
Fox, John, *An R and S-Plus Companion to Applied Regression*, Sage
Liao, Tim Futing*, Interpreting Probability Models : Logit, Probit, and Other Generalized Linear Models*, Sage
Lindsey J.K., *Analysis of Categorical Data using GLIM*, Springer Verlag, Berlin
R Development Core Team, *An Introduction to R*, http://www.stats.bris.ac.uk/R/
Venables W.N. and Ripley B.D., *Modern Applied Statistics with S-Plus*, Springer
Tacq, Jacques, *Multivariate Analysis Techniques in Social Science Research*, Sage

4.2 Part 2 Compulsory Modules

4.2.1 CFAS408 Applied Social Science Research – An Integration

Lecturers:	**Professor Roger Penn & Dr Damon Berridge**
Prerequisites:	**Methodological Debates in the Social Sciences, Generalized Linear Models (or equivalent), Multi-level Models**
Contact hours and type:	**7.5 hrs lectures/seminars**

Outline: This module synthesizes the skills learned throughout the course and is the final module prior to students' dissertations. The module focuses on the EFFNATIS survey and examines GCSE results amongst 844 young people aged 16-25 in the North West of England. School effects are introduced and modelled using a multi-level approach.

Learning: Students will learn through the application of the concepts and techniques covered earlier in the course in relation to a contemporary issue in applied social science research.

Assessment: Students will model Mathematics and English Language results. They will compare these and also assess whether the earlier models of overall GCSE results retain their heuristic power in relation to either or both of these subject results.

Bibliography:

R.Penn and D Berridge 'Modelling Trajectories through the Educational System in North West England', *Education Economics*, 2008 (forthcoming)

R.Penn and P.Lambert 'Attitudes to Ideal Family Size by Ethnic/Nationality Group in Britain, France and Germany' *Population Trends* 108, Summer 2002, pp 49-58.

S. Tomlinson 'Race, Ethnicity and Education under New Labour' *Oxford Review of Education* 31, 1, 2005 pp 153-171.

S. Jones and D. Myhill ' 'Troublesome Boys' and ' Compliant Girls': Gender Identity and Perceptions of Achievement and Underachievement' *British Journal of Sociology of Education* 25, 5, 2004

H. Mendick 'Mathematical Sories: 'Why do more Boys than Girls Choose to Study Mathematics at AS-Level in England?' *British Journal of Sociology of Education* 26, 2, 2005.

H. Goldstein *Multilevel Statistical Models*, 2003.

J. Hox *Multilevel Analysis: Techniques and Applications*, 2002.

4.2.2 CFAS409 Duration Analysis

Lecturers:	**Dr Juliet Harman & Dr Andrew Titman**
Prerequisites:	**Generalized Linear Models (or equivalent); experience in R**
Contact hours and type:	**10 hrs lecture/tutorial + 5 hrs practical sessions in which R will be used to apply the techniques**

Outline: The main aim of this module is to give a solid foundation to the understanding of the statistical techniques required to make valid inferences about duration (time to event) data from observational or experimental longitudinal studies. Examples of analyses from the social and health sciences will be used to illustrate these techniques. The emphasis will be on the practical application of techniques using the R software package and on the interpretation of resulting output.

Topics covered will include:

Basic concepts, incl. hazard and survival functions
Exploratory analyses, incl. Kaplan-Meier estimate of survival function
Semi-parametric statistical models, incl. Cox's proportional hazards
Fully parametric statistical models, incl. Weibull and other distributions
Competing risks; time-varying explanatory variables

Learning: Students will learn by applying the concepts and techniques covered in the module to data from the social and health sciences. Students will be encouraged to examine issues of substantive interest in these studies.

Knowledge and understanding:

By the end of the module successful students will:

1. Be able to analyse duration data effectively, and interpret the results
2. Be familiar with models for duration data
3. Have increased confidence in the use of the software R

Skills and other attributes:

Intellectual and thinking skills - successful students will be able to:

4. apply relevant theoretical concepts
5. identify and solve problems
6. analyse data and interpret results

Assessment: One assignment covering all aspects of the module material.

Bibliography:

Collett, D. (2003) *Modelling survival data in medical research*, 2nd edition. Chapman & Hall.

Cox, D.R. and Oakes, D. (1984) *Analysis of survival data.* Chapman and Hall.

Crowder, M.J., Kimber, A.C., Smith, R.L. and Sweeting, T.J. (1991) *Statistical analysis of reliability data*. Chapman Hall.

Elandt-Johnson, R.C. and Johnson, N. L. (1980) *Survival models and data analysis*. Wiley.

Hosmer, D. W. and Lemeshow, S. (1999) *Applied survival analysis: regression modelling of time to event data*. Wiley.

Kalbfleisch, J.D. and Prentice, R.L. (2002) *The statistical analysis of failure time data*. 2nd edition. Wiley.

Klein, J.P. and Moeschberger, M.L. (1997) *Survival analysis: techniques for censored and truncated data.* Springer.

Lawless, J.F. (2003) *Statistical models and methods for lifetime data.* Wiley-Interscience.

Machin, D, Cheung YB, Parmar, MKB (2006), *Survival Analysis: A Practical Approach*, Wiley

Pintilie, M. (2006) *Competing Risks: A Practical Perspective*, Wiley

Smith, P.J. (2002) *Analysis of failure and survival data.* Chapman and Hall.

Tableman, M. and Kim, J.S. (2004) *Survival analysis using S: analysis of time-to-event data.* Chapman and Hall.

Therneau, T. and Grambsch, P.M. (2000) *Modeling survival data: extending the Cox model*. Springer.

4.2.3 CFAS411 Multi-level Models

Module coordinator:	**Dr Damon Berridge**
Prerequisites:	**Generalized Linear Models (or equivalent); STATA**
Contact hours and type:	**10 hrs lecture/tutorial + 5 hrs practical**

Outline: The aim of this module is to highlight the problems that occur when the hierarchical nature of many social surveys is ignored in routine statistical analysis. The classical 'variance components' ANOVA model will be described and extended to the multilevel model. Estimation techniques such as REML will be outlined. The analysis of such models will be illustrated using appropriate software.

Topics covered will be:

The nature of heterogeneity and intraclass correlation. Random effects in ANOVA models, variance components and REML. The problem of bias in naïve statistical methods. Multilevel models and random parameter models. Estimation methods. Illustrations of statistical inference in statistical software such as GLLAMM.

Learning: Students will learn through the application of concepts and techniques covered in the module to real substantive issues.

Successful students will be able to:

understand the issue of heterogeneity in social studies
carry out advanced statistical procedures
apply theoretical concepts
identify and solve problems
analyse data and interpret statistical output

Assessment: A single assignment covering all aspects of the module material.

Bibliography:

Bryk, A. S., and Raudenbush, S. W., (1992) *Hierarchical Linear Models*, Sage.
Goldstein, H., (2003) *Multilevel Statistical Models*. London, Edward Arnold
Hox, J., (2002) *Multilevel Analysis*: Techniques and Applications, Mahwah, N.J: Lawrence Erlbaum Associates.
Longford, N. T., (1993) *Random Coefficient Models*. Oxford University Press.
Snijders, T. A. B., and Bosker, R. J*., (1999) Multilevel Analysis. An Introduction to Basic and Advanced Multilevel Modelling*. London: Sage.

4.2.4 CFAS414 Methods for Missing Data

Lecturer:	**Dr Emma Eastoe**
Prerequisites:	**Generalized Linear Models (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical/tutorial**

Outline: This module deals with the problem of missing data common in many social surveys; problems of bias and inefficiency of naive statistical methods; alternative procedures: basics and complications; MCAR, MAR and non-ignorable missing data; selection bias and the problem of 'dropout' in panel studies. The module will also cover appropriate statistical analysis in appropriate software. The methods will be illustrated by case study analyses.

Particular topics will be:

Assumptions for missing data methods; problems with conventional methods; Maximum Likelihood (ML) with missing data; ML with the EM algorithm; ML for contingency tables; multiple imputation (MI) for missing data; data augmentation; MI for the multivariate normal model; Markov Chain Monte Carlo (MCMC) approach; MI with SAS; MI with categorical and non-normal data; combining MI results; likelihood ratio tests; nonparametric methods; Bayesian statistics; bootstrap methods.

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be able to:

understand the problems of missing data in social studies
perform advanced statistical procedures
apply theoretical concepts
identify and solve problems
analyse data and interpret statistical output

Assessment: A single assignment covering all aspects of the module material.

Bibliography:

Allison, P.D. (2002) *Missing data*. Sage.
Breen, R. (1996) *Regression models: censored, sample selected or truncated data*. Sage.
Little, R.J.A. and Rubin, D.B. (2002) *Statistical analysis with missing data*. 2nd edition. Wiley.
Schafer, J.L. (1997) *Analysis of incomplete multivariate data*. Chapman and Hall.

4.2.5 CFAS415a Bayesian Methods

Lecturer:	**Dr David Lucy**
Prerequisites:	**Generalized Linear Models (or equivalent)**
Contact hours and type:	**15 hrs (10 hrs lectures + 5 hrs practical)**

This module introduces students to the use of Bayesian methods for data analysis in the social and empirical sciences. It also provides an introduction to the basic concepts of Bayesian approaches to statistics, ideas such as the subjective interpretation of probability, types of prior distributions, the use of Bayes theorem in updating information, and inference procedures such as Bayesian parameter estimates will be introduced to the student. The main focus of the module will be the application of Bayesian models in social sciences and related disciplines.

Students will acquire a knowledge of:

1. the fundamental notion of Bayes' theorem and the theory of inverse probability
2. the relationship between Bayesian methods and classical likelihood methods
3. the use of Bayesian methods to combine prior information with data
4. the basic concepts of Bayesian inference, including posterior conditioning, credible intervals, prior distributions, and the likelihood principle
5. an introduction to Monte Carlo Markov Chain (MCMC) methods
6. application of MCMC using WinBUGS to real estimation problems

and develop skills to:

1. apply theoretical concepts
2. examine model fitting in practice using Bayesian principles
3. explore applied Bayesian modelling

Topics covered will be:

An introduction to Bayesian analysis, single parameter Bayesian modelling, informative priors, noninformative priors, posterior and predictive distributions, conjugate distributions, Bayesian forms of confidence intervals, Bayesian regression and analysis of variance models using MCMC methods and WinBUGS.

Exercises will be provided as part of the practical sessions. The assessment will be a short assignment on Bayesian model fitting using WinBUGS.

Bibliography

Gelman, A. Carlin, J.B. Stern, H.S. and Rubin, D.B. (2004) *Bayesian Data Analysis*. Chapman & Hall/CRC, Boca Raton.

Lee, P (1998). *Bayesian Statistics: an introduction*. Halsted Press, New York.

Spiegelhalter, D. J, Thomas, A., Best, N., and Lunn, D. (2003). *WinBUGS Version 1.4 User Manual.* MRC Biostatistics Unit, Cambridge, UK. (WinBUGS is freely available from http://www.mrc-bsu.cam.ac.uk/bugs/)

4.3 Optional Modules

4.3.1 CFAS410 Event History Analysis (not available 2009/10)

Lecturers:	**Dr Damon Berridge & Dr Juliet Harman**
Prerequisites:	**Duration Analysis (or equivalent)**
Contact hours and type:	**10 hrs lecture/tutorial + 5 hrs practical sessions in which SABRE will be used to apply the techniques.**

The main aim of this module is to give a solid foundation to the understanding of the statistical techniques required to make valid inferences about event history data from observational or experimental longitudinal studies. Examples of analyses from the social sciences will be used to illustrate these techniques. The emphasis will be on the practical application of these techniques using software such as SABRE in R, and on the interpretation of resulting output.

Knowledge and understanding:

By the end of the module successful students will:

1. Be able to analyse event history data effectively, and interpret the results
2. Be familiar with models for event history data
3. Have confidence in the use of the software SABRE in R

Skills and other attributes:

Intellectual and thinking skills - successful students will be able to:

4. apply relevant theoretical concepts
5. identify and solve problems
6. analyse data and interpret results

Topics covered will include:

Specific issues arising in the analysis of event history data, incl. residual heterogeneity, state dependence, initial conditions, etc.
Random effects modelling of binary recurrent events
Duration effects, lagged response variables and two-state Markov models
Ordinal recurrent events

Assessment will be by a single assignment covering aspects of the module material.

Bibliography

Allison, P.D. (1984) *Event history analysis: regression for longitudinal event data.* Sage.

Bijleveld, C.C.J.H., van der Kamp, L.J.Th., Mooijaart, A., van der Kloot, W.A., van der Leeden, R. and Van Der Burg, E. (1998) *Longitudinal data analysis: designs, models and methods*. Sage.

Blossfeld, H.-P. and Rohwer, G. (1995) *Techniques of event history modelling: new approaches to causal analysis*. Lawrence Erlbaum Associates.

Hagenaars, J.A. (1990) *Categorical longitudinal data: log-linear panel, trend, and cohort analysis.* Sage.

Hand, D. and Crowder, M. (1996) *Practical longitudinal data analysis.* Chapman and Hall.

Jones, R.H. (1993) *Longitudinal data with serial correlation: a state-space approach.* Chapman and Hall.

Singer, J.D. and Willett, J.B. (2003) *Applied longitudinal data analysis: modelling change and event occurrence*. Oxford University Press.

Taris, T. (2000) *A primer in longitudinal data analysis*. Sage.

Twisk, J.W.R. (2003) *Applied longitudinal data analysis for epidemiology.* Cambridge University Press.

Yamaguchi, K. (1991) *Event history analysis.* Sage.

4.3.2 CFAS412 Data Mining Techniques

Lecturer:	**Professor Brian Francis**
Prerequisites:	**Generalized Linear Models (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs computer-based practical sessions**

Outline: The main aim of data mining is to extract knowledge, or information, which is stored in very large databases. This module covers many of the concepts that are fundamental to understanding and successfully applying data mining methods. Statistical concepts are discussed without mathematically complex formulation. Practical sessions will use the latest versions of standard software rather than data mining – the emphasis of the module is on techniques rather than data mining software.

The module will include the following:

1. formulating research objectives that can be translated into suitable analytical methods;
2. data structure and organisation;
3. model comparison and assessment;
4. data splitting;
5. assessing and interpreting predictive models;
6. introduction to variable selection;
7. benefits and drawbacks of neural networks;
8. examining the benefits and drawbacks of regression trees;
9. cluster analysis and latent class analysis;
10. bootstrap and cross-validation.

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of empirical interest in these studies.

Successful students will be able to:

1. identify empirical problems and determine suitable analytical methods;
2. understand the difficulties presented by massive, opportunistic data;
3. understand the concepts of using logistic regression, neural networks, projection methods and decision trees for predictive modelling;
4. prepare data for analysis, including partitioning data;
5. train, assess and compare regression models, neural networks and decision trees;
6. understand the advantages and disadvantages of cluster analysis, latent class modelling and other latent variable methods.

Assessment: A series of short assignments covering all aspects of the module material (50%) plus a larger assignment (50%) that will test the student's

ability to select the appropriate data mining techniques for a particular data set.

Bibliography:

Fayyad, U.M., Piatetsky-Shapiro, G., Smyth, P. and Uthurusamy, R. (Eds) (1996) *Advances in knowledge discovery and data mining*. Menlo Park, CA: AAAI Press.

Hand, D.J. (2000) 'Data mining - New challenges for statisticians', *Social Science Computer Review,* 18, 4, 442-449.

Hand, D.J., Mannila, H. and Smyth, P. (2001) *Principles of data mining*. Cambridge, MA: MIT press.

SAS Institute Inc.(2000) *Getting started with SAS Enterprise Miner*. Cary, NC: SAS Institute Inc.

SAS Institute Inc.(2000) *Data Mining using SAS Enterprise Miner Software : A Case Study Approach*. Cary, NC: SAS Institute Inc.

SAS Institute Web-based *'Enterprise Miner tutorial'*, available on-line at http://www.sas.com/software/tutorialsv8/em/mainmenu.htm

4.3.3 CFAS415 Structural Equation Modelling

Lecturers:	**Karen Baird and Dr Michael Green (Visiting Lecturers)**
Prerequisites:	**SPSS for Windows I (or equivalent); Generalized Linear Models (or equivalent)**
Contact hours and type:	**8 hrs lecture/demonstration + 4 hrs practical**

Outline: This module will introduce participants to latent variables (variables which are not directly measured themselves) and to the use of factor analysis in investigating relationships between latent variables and observed, or measured, variables. These techniques will then be extended into the wider area of structural equation modelling, where complex models involving several latent variables will be introduced.

The module is aimed at researchers and research students who have experience of statistical modelling (up to linear regression) and hypothesis testing, who wish to develop techniques to analyse more complex data involving latent variables. The aim of the module is to provide a background of theory with opportunities to apply the techniques in practice, and each session will consist of a lecture/ demonstration and a practical. The software packages used will be SPSS and AMOS, and while participants will be expected to be familiar with SPSS, no knowledge of the structural equation modelling package AMOS will be assumed.

In summary, the following topics will be covered:

1. introduction to latent variables and measurement error
2. exploratory and confirmatory factor analysis
3. measurement models
4. structural equation modelling

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be:

1. familiar with latent variables and factor models
2. able to investigate data using factor analysis
3. able to confirm hypotheses and develop structural equation models
4. able to apply theoretical concepts
5. able to identify and solve problems
6. able to analyse data using appropriate techniques and interpret statistical output

Assessment: One assignment (100%) covering all aspects of the module material that will test the student's ability to investigate a substantive issue using appropriate statistical techniques and interpreting the results.

Bibliography:

Arbuckle, J. L. and Wothke, W., *AMOS 4.0 User's Guide.*
Bartholomew, D.J., Steele, F., Moustaki, I. and Galbraith, J.I. *The Analysis and Interpretation of Multivariate Data for Social Scientists.*
Dunn, G., Everitt, B. and Pickles, A., *Modelling Covariances and Latent Variables using EQS*
Tabachnick, B. G. and Fidell, L. S., *Using Multivariate Statistics*

4.3.4 CFAS461 Statistics in Practice

Lecturers:	**Dr Debbie Costain, Dr Gillian Lancaster and Dr Chris Sherlock**
Prerequisites:	**None**
Contact hours and type:	**26 hrs lecture/workshop (spread over Terms 1 and 2)**

Outline: The aim of this module is to provide students with a range of skills which are necessary for applied statistical work, including team-working, oral presentation, statistical consultancy and the preparation of written reports of various kinds.

The topics covered will include:

- **Scientific writing** (Term 1)
  - LaTeX
  - Scientific writing style (e.g. consulting report, journal article)
  - Literature search and referencing
  - Graphical and tabular presentation

- **Oral presentation** (Term 2)
  - How to communicate effectively, design of slides/overheads/handouts, good and bad-habits in public speaking
  - Beamer as a presentation package

- **Study design, consultancy and communication** (Term 2)
  - Overview of the principles of study design and be able to recognise and discuss statistical design issues
  - Appreciate and advocate the role of the statistician in the research process
  - Consolidate the skills necessary to become a statistical consultant, including professionalism.

Learning: On completion of the module a student should be able to use type-setting software; demonstrate appropriate report writing structure; present data appropriately in graphs and tables and undertake basic statistical consulting.

Assessment: A set of exercises with one piece of assessed work under each of the three headings:

- written report of an analysis to include mathematical, tabular and graphical material
- oral presentation of an analysis using Beamer to produce over-heads
- designing a study to address a specific problem

Bibliography:

Altman D G (2008) Practical Statistics for Medical Research (2nd Edition). Chapman and Hall
Chatfield C (1988) Problem solving. Chapman and Hall, London.
Lamport L (1994) LaTeX: a document preparation system. Addison Wesley.
Tufte ER (2001) The visual display of quantative information. Graphics Press

4.4 Software Modules

4.4.1 CFAS417a Atlas.ti

Lecturer:	**Dr Leslie Humphreys**
Prerequisites:	**None**
Contact hours and type:	**4.5 hrs lecture/demonstration + 3 hrs computer-based practical sessions**

Outline: This module covers the basics of Atlas.ti, a popular textual analysis tool, and situates the program within the wider methodological framework of social science analysis.

The module will include the following:

1. assigning documents;
2. creating quotations and codes;
3. different ways of coding text - including automatic coding;
4. using the query tool to search for co-occurrences of codes;
5. creating subgroups (families) of documents or codes;
6. examining the output available;
7. creating network diagrams to display relationships;

The module will also comment on issues of typicality, representativeness and control using contemporary social scientific examples. Students will also be shown how to link data from Atlas.ti to other statistical packages such as SPSS.

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of empirical interest in these studies.

Successful students will:

1. understand the concepts of systematic textual analysis;
2. be able to use Atlas.ti and have an understanding of its potential for various styles of research;
3. be able to prepare data for analysis;
4. be able to code and analyse textual data systematically;
5. be able to assemble network relationship diagrams;
6. be able to interpret the results of Atlas.ti output;
7. understand the strengths and weaknesses of the different approaches to textual analysis;

Bibliography:

Agar, M. Microcomputers as field tools, *Computers and the humanities,* 17, 19-26.
Alexa, M. & Zuell, C. (2000) Text analysis software: commonalities, differences and limitations: the results of a review, *Quality & Quantity,* 34, 299-321.
Bryman, A. & Burgess, R. (eds) (1994) *Analysing Qualitative Data.* Routledge
Gilbert, N. (ed) (2001) *Researching Social Life* (2nd ed). Sage London
Muhr, T. (1991) Atlas-ti - A protoype for the support of text interpretation, *Qualitative Sociology,* 14, 4, 349-71

4.4.2 CFAS422 R

Lecturers:	**Dr David Lucy & Dr Juliet Harman**
Prerequisites:	**Statistical Methods (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical**

Outline: R is both statistical language and a major statistical software product, providing the main route to dissemination of recent statistical methodology (free to download from the internet). This module introduces R, explains the syntax and introduces a wide range of statistical models which can be fitted.

Topics covered include: an introduction to the R language, reading data, data description and graphics, the general linear model (GLM), analysis of variance, logistic regression, survival analysis, multivariate techniques, the use of R libraries and www resources in R.

In summary, the following topics will be covered:

1. manipulation and management of data in the R environment
2. summarising data numerically and graphically
3. fitting linear models in R
4. statistical analysis using R
5. functions, iterations, and conditions in R

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will:

1. have an increased understanding of the R programming language
2. be able to produce basic statistics and create graphs
3. be familiar with the R syntax for writing functions, iterations and conditions
4. be familiar with linear models in R

Bibliography:

Crawley, M.J. (2005) Statistics: an introduction using R Wiley, New York.

Dalgaard, P. (2002) Introductory Statistics with R. Springer. Faraway, J (2004) Linear models with R. Chapman and Hall..

Maindonald, J. and Braun, J. (2003) Data analysis and graphics using R. Cambridge University Press.

Venables, W and Ripley, B (2002) Modern Applied Statistics with S . Springer.

Venables, W and Smith, D (2002) In introduction to R. Network Theory Ltd. (Or downloaded for free from http://cran.r-project.org/manuals.html)

R downloadable from: http://cran.r-project.org/

R Web book: http://cran.r-project.org/doc/FAQ/R-FAQ.html

4.4.3 CFAS424 SPSS for Windows: I

Lecturers:	**Dr Leslie Humphreys & Dr Juliet Harman**
Prerequisites:	**Statistical Inference (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical**

Outline: SPSS for Windows is a statistical software package that has become synonymous with data management and analysis in the social sciences. This module will introduce participants to the manipulation and management of data in the SPSS Windows environment. In addition, participants will develop the confidence to manipulate data files in order to summarise data numerically and graphically and to perform simple statistical procedures including formal tests of hypotheses of interest.

This module is aimed at researchers and research students, with little experience of Windows computing, who would like to use SPSS in an efficient and effective manner. The aim of the module is to provide participants with as many opportunities to experiment with the package as possible. Consequently, each session will be centred around a computer-based practical encouraging participants to investigate data taken from various sources.

The following topics will be covered:

1. manipulation and management of data in the SPSS Windows environment
2. summarising data numerically and graphically
3. simple statistical procedures including formal tests of hypotheses of interest

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be able to:

1. manipulate and manage data in the SPSS Windows environment
2. summarise data numerically and graphically
3. carry out simple statistical procedures including formal tests of hypotheses of interest
4. apply theoretical concepts
5. identify and solve problems
6. analyse data and interpret statistical output
7. apply strategies for appropriate selection of information

Bibliography:

Bryman A. and Cramer D., *Quantitative Data Analysis with SPSS for Windows,* Routledge

Kinnear P. R., *SPSS for Windows made Simple,* Hove

Norusis M., *The SPSSX guide to Data Analysis,* SPSS Inc

4.4.4 CFAS425 SPSS for Windows: II

Lecturers:	**Dr Leslie Humphreys, Dr Juliet Harman & Dr Svetlana Tishkovskaya**
Prerequisites:	**SPSS for Windows: I (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical**

Outline: This module builds on previous introductory modules to cover more advanced techniques of statistical analysis. The principles of statistical inference are reviewed and applied to the general linear model. This framework is then extended to a wider class of statistical models, including non-linear, multivariate and non-normal models. The general principles of model selection and hypothesis testing are illustrated in each case by application to substantive issues in real data examples.

Topics covered will be:

General methodology for linear models: ANOVA and ANACOVA models
Extensions to: non-linear models, factor analysis, logistic regression, log-linear models and the analysis of duration data

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be able to:

1. perform advanced statistical procedures
2. identify the appropriate procedure for a particular substantive issue
3. apply theoretical concepts
4. identify and solve problems
5. analyse data and interpret statistical output
6. apply strategies for appropriate selection of information

Bibliography:

Agresti, A., *Analysis of Categorical Data*, Wiley, New York.
Liao, T.F.*, Interpreting Probability Models: Logit, Probit, and Other Generalized Linear Models*, Sage
Lindsey, J.K., *Analysis of Categorical Data using GLIM*, Springer Verlag, Berlin
Stevens, J., *Applied Mutivariate Statistics for the Social Sciences,* Lawrence Erlbaum Assoc.
Tacq, J., *Multivariate Analysis Techniques in Social Science Research*, Sage

4.4.5 CFAS426 STATA

Lecturer:	**Professor Brian Francis**
Prerequisites:	**Generalized Linear Models (or equivalent)**
Contact hours and type:	**10 hrs lecture/demonstration + 5 hrs practical**

Outline: This module introduces the STATA package, explains the syntax and introduces a wide range of statistical models which can be fitted. This comprehensive statistical system is popular with economists, epidemiologists and other social and biomedical researchers.

The module will cover data input and manipulation, data description and tabulation, graphics, ANOVA, normal and logistic regression, regression diagnostics, Poisson regression and log-linear models. Other capabilities, extensions and resources of STATA will also be discussed.

In summary, the following topics will be covered:

1. manipulation and management of data in the STATA environment
2. summarising data numerically and graphically
3. simple statistical procedures including formal tests of hypotheses of interest
4. ANOVA, normal, logistic and Poisson Regression
5. regression diagnostics
6. log-linear models

Learning: Students will learn through the application of concepts and techniques covered in the module to real data sets. Students will be encouraged to examine issues of substantive interest in these studies.

Successful students will be able to:

1. manipulate and manage data in the STATA environment
2. summarise data numerically and graphically
3. perform simple statistical procedures including formal tests of hypotheses of interest
4. apply theoretical concepts
5. identify and solve problems
6. analyse data and interpret statistical output
7. apply strategies for appropriate selection of information

Bibliography:

A handbook of statistical analysis using STATA (Rabe-Hesketh, Everitt)
Hamilton, L.(2004) Statistics with STATA.
STATA online Web books: http://www.ats.ucla.edu/stat/stata/webbooks

4.5 Additional modules for MRes

CFAS440 Techniques of Social Research

Module coordinator:	**Professor Roger Penn**
Prerequisites:	**Methodological Debates in the Social Sciences, Questionnaire Design, Sampling Design**
Contact hours:	**15 hours**

The first half of the module will examine various types of interviews, including structured, semi-structured and unstructured interviews. The variety of ways of organising such interviews will be examined, including face-to-face, telephone, internet and focus group situations. Students will conduct a variety of different kinds of interviews during the module and then will be videoed to facilitate systematic evaluation of different interview contexts.

The second part of the module will address observational techniques, with a particular emphasis upon ethnographic methods. Students will be introduced to recent developments in the use of visual representations of data, including photographs, film and camcorder research techniques. Students will undertake ethnographic work during the module and this will be probed in detail in subsequent group sessions.

Bibliography

Arksey, H. and Knight, P. (1999) *Interviewing for Social Scientists*
Atkinson, P. (2001). *Handbook of Ethnography*:
Brewer, J.D. (2000). *Ethnography.*
Bryman, A. (2001). *Ethnography*.
Denzin, N (1997) *Interpretive Ethnography*
Foddy, W. (1994). *Constructing questions for interviews and questionnaires: theory and practice in social research*:
Frey, J.H. and Oishi, S.M. (1995). *How to conduct interviews by telephone and in person.*
Frick, U. (2007) *Designing Qualitative Research*
Kvale, S. (1996). *Interviews: an introduction to qualitative research interviewing*.
Oishi, S.M. (2003). *How to conduct in-person interviews for surveys.*
Walford, G. (2002). *Debates and developments in ethnographic methodology.*

CFAS417b Textual Analysis

Module coordinator:	**Professor Roger Penn**
Prerequisites:	**Atlas.ti**
Contact hours:	**7.5 hours**

This course will examine the four main types of text– written, spoken, pictoral and video. The course provides students with skills on how to store, index and analyse all these forms of text both separately and in combination. This builds upon current innovative research taking place in Lancaster involving sociologists, psychologists and social statisticians. The course will examine how to examine these various forms of text using content analysis, discourse analysis, semiotics and statistical visualisation. A central purpose of the course is to introduce students to a range of methods that transcend the conventional (but outdated) division between quantitative and qualitative research.

Bibliography

Harper, D (1987) *Working Knowledge*
Stanczak, G (2007) *Visual Research Methods*
Phillips, S (1999) *Wallbangin':Graffiti and Gangs in LA*
Pink, S (2007) *Doing Visual Ethnography*
Wilkinson, L (1999) *The Grammar of Graphics*
Cleveland, W (1994) *The Elements of Graphing Data*
Jay, M (1994) *Downcast Eyes*
Tufte, E (2001) *The Visual Display of Qualitative Information*

4.6 Dissertation

CFAS416 Dissertation

Dissertation Coordinator: **Dr. David Lucy**

Prerequisites: **successful completion of Parts 1 and 2**

Contact hours and type: **25 hours total supervision**

Outline: After successful completion of Parts 1 and 2, students should be able to apply the knowledge that they have accrued through the taught modules and apply them to a project in applied social statistics of direct relevance to their career or career plans.

A suitable topic for the dissertation will be agreed with the student after discussion and an appropriate supervisor (or two supervisors) will be nominated. These will generally be members of university academic staff.

Learning: Students will demonstrate that they have understood the interdependencies between data, methods of analysis and substantive theory in a piece of applied research undertaken on an individual basis with regular supervision.

Students should:

- be able to apply the knowledge that they have learnt through the taught modules to a new substantive area
- demonstrate skills of research, problem solving, analysis, synthesis and academic writing
- demonstrate the ability to communicate through written and oral presentation

Assessment:

The dissertation should contain a maximum of 50 pages of single spaced A4 typescript, including all figures, tables, references and appendices. A 12pt font and standard margins should be used.

It should be presented in the style of a formal scientific report, with chapters and sections, and including an abstract, introduction, conclusions and a reference list.

Part of the assessment of the dissertation is through a 15 minute oral presentation, which will take place in early September 2009.

There will be a strict deadline in mid-September 2009 for the submission of completed dissertations. Two hard copies and an electronic copy should be submitted to the MSc Secretary in the Course Office.

4.7 Other Non-assessed Module

CFAS430 Dissertation Writing

Module Coordinators:	**Dr. Damon Berridge (Department of Mathematics and Statistics)**
Prerequisites:	**none**
Contact hours and type:	**3 hrs seminar/groupwork/presentations**

Outline:
This module provides a forum for students' questions about dissertation writing. Through groupwork and presentations, it will guide the students into understanding the nature of scientific writing. It will also cover the skills necessary to carry out a dissertation project including time management issues. It will encourage awareness of areas of writing in which students commonly have problems, and suggest ways of developing strategies to counter these problems.
Topics covered will be time management, dissertation writing, scientific style.

Successful students will be able to:

- demonstrate how to effectively manage the stages of the project and hand in on schedule [time management]
- adopt an appropriate academic scientific style for their projects
- understand some of the key expectations of dissertation writing and the criteria used in assessment
- demonstrate different ways of and models for structuring dissertations through analysis of past examples
- identify the qualities of a good project through analysis of past examples

Bibliography

Burton, D. (Editor) (2000) *Research Training for Social Scientists: A Handbook for Postgraduate Researchers.* Sage Publications Ltd

Cooley, L. and Lewkowicz, J. (2003) *Dissertation Writing in Practice: Turning Ideas into Text. Hongkong University Press*

Craswell, G. (2004) *Writing for Academic Success: A Postgraduate Guide*. Sage Publications Ltd
Hart, C. (2004) *Doing Your Masters Dissertation* (Essential Study Skills) Sage Publications Ltd

Mittelbach, F., Goossens, M., Braams, J., Carlisle, D., Rowley, C. (2004) *The LaTeX Companion* (2nd Edition). Prentice Hall.

Rudestam, K.E. and Newton R.R. (2000) *Surviving Your Dissertation: A Comprehensive Guide to Content and Process*. Sage Publications Ltd

5 Other Information

5.1 Term Dates

The following are the term dates for 2009-2010

Michaelmas Term:

2 October 2009 to 11 December 2009

Lent Term:

8 January 2010 to 19 March 2010

Summer Term:

16 April 2010 to 25 June 2010

Please note that postgraduate courses run throughout the year, including vacations.

5.2 Coursework Submission

At the end of each credit-bearing module students will be given an assignment by the course tutor. This will have to be completed within four weeks. There will be a published deadline for the submission of each piece of work.

Each completed assignment must be deposited in the box labelled 'MSc/MRes in Applied Social Statistics' in the Fylde-PSC link corridor (B Floor) by the deadline. It must be accompanied by a Coursework Cover Sheet and students must declare the work as their own. See Section 5.3 on the penalties for plagiarism.

Binders should not be used when submitting coursework, but a single staple may be used. This makes it easier to photocopy the assignment for the examiners.

Students should comply strictly to the deadlines set for coursework submission. If there are exceptional circumstances, application can be made for an extension using the "Application for Extension" form (available from the course office, PSC B78) giving reasons. Otherwise penalties as described in Section 5.5.4 apply.

5.3 Plagiarism

Plagiarism involves the unacknowledged use of someone else's work, and passing it off as one's own. The University deals very severely with students found guilty of plagiarism.

This category of cheating includes the following:

a) Collusion, where a piece of work prepared by a group is represented as if it were the student's own;
b) Commission or use of work by the student which is not his/her own and representing it as if it were:

- purchase of a paper from a commercial service, including internet sites, whether pre-written or specially prepared for the student concerned

- submission of a paper written by another person, either by a fellow student or a person who is not a member of the university;

c) Duplication of the same or almost identical work for more than one module;
d) The act of copying or paraphrasing a paper from a source text, whether in manuscript, printed or electronic form, without appropriate acknowledgement;
e) Submission of another student's work, with or without that student's knowledge or consent.

There is an approved framework to deal with plagiarism. Full details can be found at: http://www.lancs.ac.uk/depts/studreg/facts/plagiarism.htm

5.4 General Information on Assessment

5.4.1 Introduction

Taught postgraduate courses are assessed by assignments. Assessment is linked to each individual module. The regulation for assignments is contained in the University Examination Regulations, which can be consulted in the Departmental Office or via the web address:

http://www.lancs.ac.uk/celt/celtweb/marp

This booklet gives more detailed information on assignments in the MSc in Applied Social Statistics programme.

5.4.2 Assessment Registration

Students are automatically registered for assessment for all the taught modules that they have registered to take. Students are required to choose their options at the beginning of each year, but options may be changed at the

discretion of the Course Director. Should a student wish to drop an option (after being entered for assessment), he/she should inform Angela Mercer, MSc Secretary as soon as possible.

5.4.3 External Examiners

All assignments will be independently checked. Assignments, model solutions and marking schemes will be scrutinised by appointed external examiners. Precise marking schemes will be employed for assignments. The Course Director will have responsibility for overall comparability.

Marked assignments and submitted dissertations will be examined by the external examiners who will assess the dissertation in the same manner as an MPhil/PhD degree, with the exception of dissertation length and minimum period of study. An internal examiner (who may be the Course Director, provided he/she is not the supervisor) will liaise with the external examiners and provide any additional information as is necessary.

5.4.4 Marking Criteria for Assessment

Students will receive written comments prepared by internal assessors on individual pieces of coursework, together with a percentage mark. These are provisional marks which will be moderated by external examiners and require ratification by the Board of Examiners. The information below gives guidance on the general criteria used to assess submitted work. Specific assessment criteria relating to individual modules will be explained by the module tutor.

Criteria for Substantive Courses

70 and above – equivalent to a distinction
An outstanding piece of work in every regard which demonstrates:

- A thorough and wide-ranging knowledge of the substantive issues
- A thorough and insightful understanding of the substantive issues involved
- An ability to analyse critical contributions on the substantive issues
- An ability to research and bring together material to support an argument
- An ability to express an original, reasoned argument in a lucid manner
- Excellent research competencies in terms of presentation, language and referencing

60-69 – equivalent to a pass
A good piece of work which demonstrates:

- A sound understanding of the substantive issues involved
- A good knowledge of the critical contributions on the substantive issues
- An ability to organise research material
- An ability to present a clear, convincing argument
- Good research competencies in terms of presentation, language and referencing

50-59 – equivalent to a pass
A fair piece of work which demonstrates:

- A reasonable understanding of the substantive issues
- A familiarity with critical contributions on the substantive issues
- An ability to use research material to support ideas and arguments
- Competent research skills in terms of presentation, language and referencing

40-49 – equivalent to a fail (see Rules)
Work at this level will demonstrate:

- A general, but incomplete understanding of the substantive issues
- Some knowledge of the literature on the substantive issues
- Some ability to develop and support an argument

- A tendency to express ideas through description and anecdote rather than analysis
- Difficulties with presentation, language and referencing

39 and below – fail
This is an unsatisfactory piece of work which demonstrates:
- Little understanding of the substantive issues and their implications
- A limited amount of reading and poor knowledge of the previous contributions on the substantive issues
- Limited ability to formulate and sustain a clear argument
- Poor presentation skills and serious problems with language and referencing

0 – in cases where there is clear evidence of plagiarism or collusion the work will normally receive a mark of 0%.

Criteria for Methodology and Software Courses

70 and above – equivalent to a distinction
An outstanding piece of work in every regard which demonstrates:
- Good discussion of the limitations of the data and the modelling
- High competence in the use of appropriate statistical method(s) and software
- An ability to make good substantive interpretation of output in nearly all situations
- An ability to make an in-depth interpretation of output in most situations
- Excellent research competencies in terms of presentation, language and referencing
- Good suggestions for improvements in the design and analysis of the study being analysed

60-69 – equivalent to a pass
A good piece of work which demonstrates:
- High competence in the use of appropriate statistical method(s) and software
- An ability to make a basic level interpretation of output in most situations
- An ability to make an in-depth interpretation of output in a substantial number of situations
- Good research competencies in terms of presentation, language and referencing

50-59 – equivalent to a pass
A fair piece of work which demonstrates:
- Moderate competence in the use of appropriate statistical method(s) and software
- An ability to make a basic level interpretation of output in most situations
- An ability to make an in-depth interpretation of output in a substantial number of situations but not most situations
- Competent research skills in terms of presentation, language and referencing

40-49 – equivalent to a fail (see Rules)
Work at this level will demonstrate:
- Low competence in the use of appropriate statistical method(s) and software
- An ability to make a basic level interpretation of output in a substantial number of situations but not most situations
- An ability to make an in-depth interpretation of output in less than a substantial number of situations
- Difficulties with presentation, language and referencing

39 and below – fail
This is an unsatisfactory piece of work which demonstrates:
- Very low competence in the use of appropriate statistical method(s) and software
- An ability to make a basic level interpretation of output in less than a substantial number of situations
- An ability to make an in-depth interpretation of output in less than a substantial number of situations
- Poor presentation skills and serious problems with language and referencing

0 – in cases where there is clear evidence of plagiarism or collusion the work will normally receive a mark of 0%.

Plagiarism and Collusion

Plagiarism occurs where a student submits another person's work as though it were his/her own. All forms of plagiarism are considered serious academic offences and you will receive 0% for any work found to be plagiarised.

(1) Students must not by implication or otherwise represent the work of others as their own, including the work of other students and material found in published, unpublished, or electronic sources.

(2) All sources, books, articles, etc. must be explicitly acknowledged in the essay or dissertation and in the bibliography. All quotations and close paraphrases must be clearly attributed.

(3) Students must not submit work that is identical or substantially similar for assessment in more than one course, whether in the same department, another department, or at another university.

Cases of plagiarism will be reported to the Board of Examiners and will normally result in a fail mark for a module and can result in the failure of the course as a whole. Deliberate plagiarism is uncommon, but you may break the regulations inadvertently by failing to explicitly attribute your sources. You must avoid this by adopting a recognised referencing system used consistently in the preparation and presentation of your work.

5.5 Procedures for Consideration of Results

5.5.1 Pass

The University's minimum threshold of attainment for the award of the postgraduate diploma, MSc or MRes shall be signified by a weighted mean mark of 50% in taught modules (plus 50% in the dissertation for MSc/MRes).

5.5.2 Distinction

The University's minimum threshold of attainment for the award of the qualification of MSc/MRes with Distinction shall be signified by an overall weighted mean mark of 70%. A Distinction may be awarded only to a candidate demonstrating a consistently high level of attainment across all assessed elements (including dissertation for MSc/MRes) of the programme.

5.5.3 Moderation

Each taught module will be subject to second marking: all completed assignments will be assessed by more than one marker, but the second marker will know the mark allocated by the first marker. Marks for individual modules may be moderated by a scaling procedure to ensure comparability with other modules.

Each MSc/MRes candidate submits two loose bound copies of their dissertation (and an electronic copy) to the Course Office. The dissertation is marked by two internal examiners (one usually being the project supervisor). Each internal examiner prepares a written report within one month of submission. The internal examiners make one of the following recommendations to the external examiner:

If a student was recommended a distinction on the basis of courses in Parts 1 and 2: pass with distinction, pass, pass – minor textual corrections within one

month, fail – permission to resubmit at discretion of examiners, fail – award diploma.

If a student was NOT recommended for distinction on the basis of courses in Parts 1 and 2: pass, pass – minor textual corrections within one month, fail – permission to resubmit once at discretion of examiners, fail – award diploma.

5.5.4 Late submission of coursework

There are published deadlines for the submission of coursework; there are published procedures for the granting of extensions; work submitted after a deadline but within the time limit of an approved extension shall not be subject to penalty; work submitted late without an approved extension shall normally be penalised, as follows: work submitted 1-7 days late will have 10 marks deducted and material submitted more than 7 days late will be awarded a mark of 0.

5.5.5 Reassessment of failed modules/dissertation

Where a candidate obtains a mark of less than 50% for a module, he/she shall be entitled to one opportunity for reassessment in each failed module/element within the programme, provided that the total number of failed modules/elements is equivalent to no more than 50% of the weighted programme. Modules, if passed, may each be awarded a mark no greater than 50%. A failed dissertation may be resubmitted once, and reassessed for a maximum mark of 50%, at the discretion of the examiners. Such re-assessment must normally be completed within 12 months of the first attempt.

5.5.6 Condonation/compensation

To qualify for an award, candidates should pass all the assessments required by their programme. Notwithstanding this requirement, candidates shall be eligible for an award by condonation/compensation in respect of up to and including 40 credits of a taught Masters programme (30 credits of a postgraduate diploma) provided that:

(a) no single module mark falls below 40%
(b) the candidate's weighted mean mark is 50% or greater
(c) the module(s) failed have not been designated by the department as essential to achievement of the programme's learning outcomes.

5.5.7 Dissemination of results

Under the Data Protection Act, the University is not allowed to disclose your results to any third party without your permission, except for the purpose of formal assessment. As soon as results can be released, they are made available via the Course Director. Note that the results are not officially confirmed until they have been seen by the External Examiners and approved

by Senate. Please note that an award will be notified officially only after clearance procedures have been carried out.

5.6 Guidelines for the Preparation of Dissertations

The guidelines for the supervision and preparation of dissertations for the award of MSc/MRes in Applied Social Statistics follow those for an MPhil/PhD degree, with the exception of dissertation length (maximum 50 pages) and minimum period of study (3 months full-time or part-time equivalent).

The University's general regulations on the supervision and preparation of dissertations for the award of an MPhil/PhD degree can be consulted in the Departmental Office or via the web address:

http://www.lancs.ac.uk/depts/studreg/docs/pghandbook.pdf

Dissertations must be submitted at the end of the course, and will be examined once a year, in October.

5.7 Seminars and Research Workshops

Students would also be encouraged to attend seminars and forum talks arranged by the Statistics Group, comprising staff and students from the Department of Mathematics and Statistics. The seminars, presented by invited speakers, usually take place on Friday afternoons. The forum, at which members of the Statistics Group present their current research work, usually takes place at Thursday lunchtimes.

Students are encouraged to participate in the University's Graduate Training Programme.

5.8 Facilities for Postgraduate Students

5.8.1 Computing

Students will be able to attend introductory sessions on computing facilities and software and will also be introduced to the campus e-mail system. Students will have access to a wide range of University and Departmental equipment and IT facilities. Software will be provided free of charge to UK-based students.

Computer access is provided in the Postgraduate Statistics Centre and in the John Nelder Laboratory, which is available for postgraduate use when it is not booked for teaching.

5.8.2 Library

Students have access to the facilities offered by the University library and the Department's small library, which is situated in the Postgraduate Statistics Centre.

5.8.3 General

Outside the Department, the University has in place a series of systems offering academic, administrative and personal advice and support. These comprise a wide range of student support facilities including the Student Learning Development Centre (SLDC), Student Support Office, Student Registry, Counselling Service, Medical Centre, Chaplaincy Centre, Harassment Network, Pre-School Centre, Disabilities Adviser, Students' Union and Nightline. All postgraduate students will automatically become members of Graduate College.

5.8.4 Student Learning Development Centre (SLDC)

The SLDC offers learning support, including tutorials and a range of classes on study and writing in Science and Technology.

It specifically addresses the needs of students:

- who are non-native speakers of English.
- with disabilities such as dyslexia.
- whose previous educational experience has not adequately prepared them for university in Britain.
- who are keen to develop their abilities in order to achieve better results in their course.

Contact: Robert Blake (Academic Support Tutor for Science and Technology) at SLDC, Furness C floor [Office C8a] Telephone: 01524 592391

SLDC Website: www.lancs.ac.uk/dept/celt/sldc

Science and Technology resources:
http://www.lancs.ac.uk/depts/celt/sldc/materials/science/science.htm

5.8.5 Student Support Services

We hope you have an enjoyable and productive time at Lancaster, but recognise that sometimes problems can affect your ability to study.

Please do not forget that it is your degree and your responsibility to seek help if you are experiencing difficulties. The University will do whatever is possible to assist you, within the Rules and Guidelines of the University, if you are having problems provided that we are aware of those problems. The problems may be personal, financial or academic. If you find yourself getting into difficulties we strongly urge you to consult your department, the Graduate College, the Postgraduate Studies Office, the Student Support Office, the Counselling Service, or the Students' Union Advice Centre.

Student Support Services incorporate the following services:
See website: http://www.lancs.ac.uk/users/studentservices/

COUNSELLING - provides confidential and professional support on issues such as personal, family, social or academic matters over the short term, to more complex or difficult longer term problems. The service offers both appointment and drop-in sessions.

HEALTHCARE - The Nurse Unit offers dedicated 24hr nursing care during term time, including in-patient facilities. In addition experienced staff can provide information, general advice or referral where necessary on a wide range of health-related matters.

DISABILITY - provides help for disabled students from the first enquiry to graduation.

INTERNATIONAL STUDENTS - provides advice on visa extension, rules on working in the UK, budgeting, general welfare and cultural orientation. They are the designated point of advice for immigration issues.

STUDENT FUNDING - provides information and advice on financial support and aid, including student living cost loans/grants, tuition fee loans and advice on living costs and budgeting. The section manages a range of University financial awards.

MENTAL HEALTH - provides confidential, professional and practical support for students with declared mental health difficulties.

GENERAL WELFARE - assists with a range of issues (personal, general, welfare, study-related) impacting academic life and experience. This includes guidance on changing direction by suspending, transferring or withdrawing from a course of study.

Other Central Services

CENTRE FOR EMPLOYABILITY, ENTERPRISE AND CAREERS (CEEC)
Whether you are thinking about going into work or thinking about further study, this service will support you through the whole process of identifying career choices. CEEC is situated in Alexandra Square. **Tel: 92480**

THE CHAPLAINCY CENTRE:
An ecumenical environment providing another source of welfare, advice and often practical support from the various Chaplains. **Tel: 94071**

HARASSMENT NETWORK:
The Harassment Network provides confidential support for any student or staff member who feels they are subject to harassment. Contact network members by phone (see internal telephone directory or by email at *HarassNet@lancaster.ac.uk*. For further information about the network contact Rosemary Turner, Harassment Network Co-ordinator. **Tel 94028**

STUDENTS' UNION ADVICE CENTRE: offers a full range of financial and welfare advice to students. **Tel: 92200**

***NIGHTLINE*:** A listening service run by the Students' Union, operated by trained students between 10pm and 8am during term time. **Tel: 94444**.

Health Services on Campus

THE NURSE UNIT: located in the Reception Lodge is a confidential, non-judgemental, easily accessible, drop-in service **open 24 hours during term-time and between 9 a.m. to 5.p.m. on Saturdays and Sundays in the vacations**. The experienced nursing team can offer advice on a wide range of health-related matters from healthy lifestyles through to specific medical conditions. The nurses will be able to deal with minor ailments and can perform wound dressings, remove sutures and clips and various other treatment-room procedures. The Unit has bedded facilities that can accommodate students who need temporary short-term care. **Tel: 94737**

EMERGENCIES*: *Anyone needing an ambulance should dial 999 on the internal telephone system rather than a mobile. The call is channelled through Security, who can meet the ambulance and quickly direct to the scene. Security will also ask a Nurse to attend until the ambulance arrives.

MEDICAL PRACTICE: a General Practice, housed at the Health Centre on campus (located on the perimeter road near to the Pre-School Centre), and available to students registered with the Practice. Registered patients can also been seen at the King Street Practice in Lancaster.
Tel: 94130

DENTAL CLINIC: offers private treatment to students who are registered, and is adjacent to Bailrigg House, at the north end of campus. **Tel: 94595.** The Local NHS Trust provides a Dental Access Clinic offering emergency treatment for those not registered locally. (For Lancaster residents **Tel:** 01539 716822).

PHARMACY: located alongside the Dental Clinic. **Ext: 94598**

ALTERNATIVE HEALTH CARE: at the Chaplaincy Centre there is an alternative and complementary health care service with discounted rates for students. **Tel : 94071**

Further details of Lancaster's Support Network is available on:
http://www.lancs.ac.uk/users/studentsupport/network/index.htm

5.9 Safety Information

5.9.1 Safety at the University

Under Health and Safety regulations, all members of the University, including students, have an individual responsibility to co-operate to enable the University to comply with the law, and to ensure the workplace is safe for everyone. Students must take reasonable care for the health and safety of themselves and other persons who may be affected by the way in which they carry out their work.

The University has a general Statement of Safety Policy, a copy of which can be accessed at the web address:

http://www.lancs.ac.uk/depts/safety/policy/default.htm

Please observe all safety notices in University buildings. In particular, take note of any emergency exit signs and any notices detailing actions in the event of a fire or other emergency.

5.9.2 Safety within the Department

The Head of Department, Professor Gordon Blower, has overall responsibility for safety within the Department. The Departmental Safety Officer is Cyrus Gaviri.

A fire drill is held in each University building at least once per term. The Fire Alarm signal is a loud ringing bell tone. You should treat all Fire Alarm signals as an emergency. In the event of a fire, raise the alarm and leave the building quickly and carefully, do not use the lifts, and make sure you assemble well away from the building as directed by security staff. In the event of an accident, you should try to contact a first-aider or the duty doctor at the University Health Centre (internal number 94134) and then make sure it is reported to the Departmental Office.

It is important that if you become aware of any safety hazards or if a problem has occurred then you should report the problem to a member of staff.

The Departmental Safety Policy is documented in the Manual of Safety, which provides further information about safety aspects within the Department. A hard copy of this policy can be obtained from the Departmental Office on request. A copy can also be accessed via the University web page at the address:
http://www.lancs.ac.uk/depts/safety/default.htm

5.10 Academic Support

Each student will be allocated a tutor who will provide general academic and pastoral support. Additional support will be provided within the Department of Mathematics and Statistics by the Course Director, the Postgraduate Tutor, course lecturers and other members of academic staff. The Course Director will meet on a regular basis with students to discuss progress.

5.11 Quality Assurance

The programme will be reviewed each year in line with other current postgraduate courses. External examiners will be asked to submit a report commenting specifically on the quality of the course in terms of assignments and dissertations, student experience and as an activity within the current postgraduate portfolio of the Faculty of Science and Technology.

A formal appraisal of student progress and academic teaching and supervision will take place at regular staff-student course committee meetings.

Standard departmental and extra-departmental staff development and appraisal schemes will be used as mechanisms for assuring high teaching quality. Individual teaching profiles will incorporate student feedback gathered through feedback questionnaires on each taught module. Any specific concerns can then be raised together with an individual appraiser during an annual appraisal. Formal staff development opportunities within the HEDC may be useful in facilitating development in response to specific concerns.

The external examiners' comments and student feedback will be fed into the annual academic review along with staff experiences of success or shortcomings of particular modules and/or teaching methods. The annual academic review will take place in November.