Honour School of Mathematics and Statistics

Draft Supplement to the Undergraduate Handbook Syllabus and Synopses for Part B 2009–2010 for examination in 2010

Contents

Revised 06/09

1. Honour School of Mathematics and Statistics

See the current edition of the Examination Regulations for the full regulations governing these examinations. http://www.admin.ox.ac.uk/examregs/

In Part B each candidate shall offer a total of four units from the schedule of units and half-units.

(a) Each candidate shall offer the unit BS1 (Applied Statistics).
(b) Each candidate shall offer a total of at least one unit from the units and half-units available under BS2 (Statistical Inference) and BS3 (Stochastic Modelling).
(c) Each candidate may offer a total of at most one unit from BS4 (Actuarial Science) and the schedule of 'Other units and half units' (Ambassador's Scheme, half-unit) .
(d) Units from the schedule of 'Mathematics Department units and half-units' for Part B of the Honour School of Mathematics are also available.

Students staying on to take the four-year course will take two units from Part C in their fourth year, and will also offer a dissertation on a statistics project. Of the two units from Part C, at least half a unit will be from the schedule of 'Statistics' units for Part C.

In the classification awarded at the end of the third year, unit paper marks in Part A will be given a 'weighting' of 2, and unit paper marks in Part B will be given a 'weighting' of 3. For those students staying on to do the fourth year, a separate class will be awarded on the basis of the Part C marks.

We ask that you register by the end of week 9 Trinity Term 2009 for classes for the Mathematics/ Statistics courses that you wish to take. A registration form is attached to these synopses. Some combinations of subjects are not advised and lectures in these subjects may clash. However, when timetabling lectures we will aim to keep clashes to a minimum.

Language Classes: If there are places available, Mathematics and Statistics students will be invited to apply to take classes in a foreign language. In 2009-2010 classes are offered in French and German. Students' performance in these classes will not contribute to the degree classification in Mathematics and Statistics. However successful completion of the course may be recorded on student transcripts. See http://www.maths.ox.ac.uk/current-students/undergraduates/handbooks-synopses for further information.

1.1 Units and half-units and methods of examination

Most subjects offered have a 'weight' of one unit, and will be examined in a 3-hour examination paper. In some of these subjects it will also be possible to take the first half, or either half, of the subject as a 'half-unit'. Where this is the case, a half-unit will usually be examined in an examination paper of 1 ½ hours.

Rubrics on 3-hour examination papers
The rubric on 3-hour examination papers will usually be: "candidates may submit as many questions as they wish; the best two from each section will count for the total mark".

Rubrics on 1 ½ hour examination papers
The rubric on 1 ½ -hour examination papers will usually be: “candidates may submit as many questions as they wish; the best two will count for the total mark”.

Number of questions set per half-unit
In the exam, on each half-unit there will be 3 questions set.

BS1 Applied Statistics
This will be examined via a 2-hour examination paper plus assessed practical assignments.

BS1 will have 3 questions on the Michaelmas term material and 2 questions on the Hilary term material.

For the 2-hour BS1 paper, a candidate’s best 2 answers from the Michaelmas term section and his/her best answer from the Hilary term section will count for the total mark.

1.2 Classification in the Honour School of Mathematics

Each candidate will receive a numerical mark on each paper in each Part of the examination in the University standardised range 0-100, such that

- a First Class performance (on that paper) is indicated by a mark of 70 to 100;
- an Upper Second Class performance (on that paper) is indicated by a mark of 60 to 69;
- a Lower Second Class performance (on that paper) is indicated by a mark of 50 to 59;
- a Third Class performance (on that paper) is indicated by a mark of 40 to 49;
- a Pass performance (on that paper) is indicated by a mark of 30 to 39;
- a performance at the level of a Fail (on that paper) is indicated by a mark of 0 to 29.

In order to arrive at such University standardized marks (or USMs) for each paper, the examiners will mark and assess papers in the ways described below.

Parts B and C

The Examination Papers

Where not otherwise stated, an overview of the syllabus and form of the papers for each unit and half unit is given in the lecture synopsis.

Marking of Papers

For Department of Statistics papers in Part B and Part C mark schemes for questions out of 25 will aim to ensure that the following qualitative criteria hold:

- 20-25 marks: a completely or almost completely correct answer, showing excellent understanding of the concepts and skill in carrying through the arguments and/or calculations; minor slips or omissions only.

- 13-19 marks: a good though not complete answer, showing understanding of the concepts and competence in handling the arguments and/or calculations. In this range, an answer might consist of an excellent answer to a substantial part of the question, or a good answer to the whole question which nevertheless shows some flaws in calculation or in understanding or in both.

This should be regarded only as a guide, conveying the intention of the examiners.

In many cases candidates will be taking papers applicable to several Schools: one group of examiners will determine the USM algorithm for a given paper and the resulting USMs will then be used by the examiners responsible for the particular candidate.

Analysis of marks

Part A

At the end of the Part A examination, a candidate will be awarded a University standardised mark (USM) for each of the four papers. The Examiners will recalibrate the raw marks to arrive at the USMs reported to candidates. In arriving at this recalibration, the examiners will principally take into account the total sum over all four papers of the marks for each question, subject to the rubric on each paper.

The Examiners aim to ensure that all papers and all subjects within a paper are fairly and equally rewarded, but if in any case a paper, or a subject within a paper, appears to have been problematical, then the Examiners may take account of this in calculating USMs.

The USMs awarded to a candidate for papers in Part A will be carried forward into a classification as described below.

Part B

The Board of Examiners in Part B will assign USMs for full unit and half unit papers taken in Part B and may recalibrate the raw marks to arrive at university standardised marks reported to candidates. The full unit papers are designed so that the raw marks

sum to 100, however, Examiners will take into account the relative difficulty of papers when assigning USMs. In order to achieve this, Examiners may use information on candidates' performances on the Part A examination when recalibrating the raw marks. They may also use other statistics to check that the USMs assigned fairly reflect the students' performances on a paper.

The USMs awarded to a candidate for papers in Part B will be aggregated with the USMs from Part A to arrive at a classification.

Part C

The Board of Examiners in Part C will assign USMs for full unit and half unit papers taken in Part C and may recalibrate the raw marks to arrive at university standardised marks reported to candidates. The full unit papers are designed so that the raw marks sum to 100, however, Examiners will take into account the relative difficulty of papers when assigning USMs. In order to achieve this, Examiners may use information on candidates' performances on the earlier Parts of the examination when recalibrating the raw marks. They may also use other statistics to check that the USMs assigned fairly reflect the students' performances on a paper.

The USMs awarded to a candidate for papers in Part C will be aggregated to arrive at a classification for Year 4.

Aggregation of marks for award of Part B

All successful candidates will be awarded a classification at the end of three years, after the Part B examination. This classification will be based on the following rules.

A *Strong Paper rule* is adopted for classification.

By the *n*th class strong paper rule we mean that for a candidate to be classified at the *n*th class standard, at least 3 papers from Parts A and B must lie in the nth class (or above) and at least one of these is at Part B. For example, for a First class award, a candidate would need at least 3 of their whole unit paper USMs to be first class marks (with at least 1 first class whole unit at Part B) together with a weighted average score of Parts A and B over 70.

In effect we are looking at a *marks profile.*

Let *AvUSM-PartA&B* = *Average weighted USM in Parts A and B together* (rounded up to a whole number);

The Part A USMs are given a weighting of 2, and the Part B USMs a weighting of 3 for a full unit and 1.5 for a half unit.

- First Class: *AvUSM-PartA&B* ≥ 70 and the first class strong paper rule satisfied.
- Upper Second Class: *AvUSM-PartA&B* ≥ 70 not satisfying the first class strong paper rule,
  OR 70 > *AvUSM-PartA&B* ≥ 60 and the upper second strong paper rule satisfied.

- Lower Second Class: 70 > *AvUSM-PartA&B* ≥ 60 and not satisfying the upper second strong paper rule,
  OR 60 > *AvUSM-PartA&B* ≥ 50 and the lower second strong paper rule satisfied.

- Third Class: 50 > *AvUSM-PartA&B* ≥ 40
  OR 60 > *AvUSM-PartA&B* ≥ 50 and not satisfying the lower second strong paper rule.

- Pass: 40 > *AvUSM-PartA&B* ≥ 30.

- Fail: *AvUSM-PartA&B* < 30.

[Note: Half unit papers count as half a paper when determining the average USM, or determining the number of strong papers.]

BA in Mathematics and Statistics

All candidates who wish to leave at the end of their third year and who satisfy the Examiners may supplicate for a classified BA in Mathematics at the end of Part B based on the above classification.

MMath in Mathematics and Statistics

In order to proceed to Part C, a candidate must minimally achieve lower second standard in Part A and Part B together.

Candidates successfully studying for a fourth year will receive a separate classification based on their University standardised marks in Part C papers, according to the following rules.

AvUSM-PartC = Average USM in Part C (rounded up to a whole number)

- First Class: *AvUSM-PartC* ≥ 70

- Upper Second Class: 70 > *AvUSM-PartC* ≥ 60

- Lower Second Class: 60 > *AvUSM-PartC* ≥ 50

- Third Class: 50 > *AvUSM-PartC* ≥ 40

A ‘Pass’ will not be awarded for Year 4. Candidates achieving *AvUSM-PartC* < 40 may supplicate for a BA with the classification obtained at the end of Part B.

[Note: Half unit papers count as half a paper when determining the average.]

Candidates leaving after four years who satisfy the Examiners may supplicate for an MMath in Mathematics and Statistics, with two associated classifications; for example:

MMath in Mathematics and Statistics: Years 2 and 3 together – First class; Year 4 – First class.

Note that successful candidates may supplicate for one degree only – either a BA or an MMath. The MMath is doubly classified but a candidate will not be awarded a BA degree and an MMath degree.

Class Descriptors

The average USM ranges used in the classifications reflect the following descriptions:

- First Class: the candidate shows excellent skills in reasoning, deductive logic and problem-solving. He/she demonstrates an excellent knowledge of the material, and is able to use that innovatively in unfamiliar contexts.

- Upper Second Class: the candidate shows good or very good skills in reasoning, deductive logic and problem-solving. He/she demonstrates a good or very good knowledge of much of the material.

- Lower Second Class: the candidate shows adequate basic skills in reasoning, deductive logic and problem-solving. He/she demonstrates a sound knowledge of much of the material.

- Third Class: the candidate shows reasonable understanding of at least part of the basic material and some skills in reasoning, deductive logic and problem-solving.

- Pass: the candidate shows some limited grasp of basic material demonstrated by the equivalent of an average of one meaningful attempt at a question on each unit of study. A stronger performance on some papers may compensate for a weaker performance on others.

- Fail: little evidence of competence in the topics examined; the work is likely to show major misunderstanding and confusion, coupled with inaccurate calculations; the answers to questions attempted are likely to be fragmentary only.

2 Statistics units and half units

2.1 BS1 Applied Statistics

Level: H-level
Method of Assessment: 2-hour examination plus assessed practical assignments. The practical assignments contribute 1/3 of the marks for BS1.
Prerequisites: Part A *Probability* and *Statistics*.

Weight: One unit.

Aims
The course aims to develop the theory of statistical methods, and also to introduce students to the analysis of data using a statistical package. The main topics are: simulation based inference, practical aspects of linear models, logistic regression and generalized linear models, and robust and computer-intensive methods.

2.1.1 *Applied Statistics* I – 16 MT

Synopsis
Practical aspects of linear models and analysis of variance: review of multiple regression, model selection, fit criteria, use of residuals, outliers, leverage, Box-Cox transformation, model interpretation.
Logistic regression. Linear exponential families and generalized linear models, scale parameter, link functions, canonical link. Maximum likelihood fitting and iterated weighted least squares. Asymptotic theory: statement and applications to inference, analysis of deviance, model checking, residuals. Inference using simulation methods.

2.1.2 *Applied Statistics II* – 10 HT

Synopsis
Nonparametric inference. Permutation tests. Rank statistics. Robust estimation. Breakdown point. Robust and resistant regression. Smoothing methods (kernels, splines, local polynomials). Bootstrapping.

Reading (Michaelmas Term)
A. C. Davison, *Statistical Models*, CUP, 2003
A. J. Dobson, *An Introduction to Generalized Linear Models*, Chapman and Hall (1990)
D. Lunn, *Notes* (2003)

Reading (Hilary Term)
P. J. Rousseeuw and A. M. Leroy, *Robust Regression and Outlier Detection*, Wiley (1987), pp 1-194.
J. D. Gibbons, *Nonparametric Statistical Inference*, Marcel Dekker (1985), pp 1-193, 273- 290.
R. H. Randles and D. A. Wolfe, *Introduction to the Theory of Nonparametric Statistics*, Wiley (1979), pp 1-322.

Further Reading
F. L. Ramsey and D. W. Schafer, *The Statistical Sleuth: A Course in Methods of Data Analysis*, 2nd edition, Duxbury (2002)

W. N. Venables and B. D. Ripley, *Modern Applied Statistics with S*, Springer (2002)
L. Wasserman, *All of Nonparametric Statistics*, Springer (2004)

Practicals
In addition to the lectures there will be five supervised practicals. Four of these contain problems whose written solutions will be assessed as part of the unit examination. Similar practical applications will be used as illustrations in lectures.

2.2 **BS2a Foundations of Statistical Inference – 16 MT**

Level: H-level
Method of Assessment: 1 ½ -hour examination
Weight: Half-unit

Prerequisites: Part A *Statistics* course.

Learning outcomes
Understanding how data can be interpreted in the context of a statistical model. Working knowledge and understanding of key-elements of model-based statistical inference, including awareness of similarities, relationships and differences between Bayesian and frequentist approaches.

Synopsis
Exponential families: Curved and linear exponential families; canonical parametrization; likelihood equations. Sufficiency: Factorization theorem; sufficiency in exponential families.

Frequentist estimation: unbiasedness; method of moments; the Cramer-Rao information inequality; statement of the large sample distribution of the MLE; proof for curved exponential families assuming consistency.

The Bayesian paradigm: subjective probability; prior to posterior analysis; conjugacy; examples from exponential families. Choice of prior distribution: proper and improper priors; Jeffreys' and maximum entropy priors. Hierarchical Bayes models, graphical representation.
Computational techniques: Markov chain Monte Carlo methods; sampling importance resampling; data examples.

Decision theory: risk function; randomized decision rules; admissibility. Rao-Blackwell theorem: Rao-Blackwellization; illustration with squared error loss. Minimax rules, Bayes rules and admissibility. Hypothesis testing as decision problem.

Reading
P. H. Garthwaite, I. T. Jolliffe and Byron Jones, *Statistical Inference,* Second ed. Oxford University Press, 2002
G.A.Young and R.L. Smith, *Essentials of Statistical Inference*, Cambridge University Press, 2005.
T. Leonard and J.S.J. Hsu, *Bayesian Methods*, Cambridge University Press, 2005.
Further reading
D. R. Cox, *Principles of Statistical Inference*, Cambridge University Press, 2006

2.3 BS3 Stochastic Modelling

Level: H-level
Method of Assessment: 3-hour or 1 ½ -hour examination

Weight: One unit, or the first 16 lectures can be taken as a half-unit in Applied Probability. The second 16 lectures cannot be taken as a half-unit.

Prerequisites: Part A *Probability* for the first 16 lectures. Part A *Statistics* in addition for the second 16 lectures.

Aims*:* This unit has been designed so that a student obtaining at least an upper second class mark on the whole unit can expect to gain exemption from the Institute of Actuaries' paper CT4, which is a compulsory paper in their cycle of professional actuarial examinations. The first half of the unit, clearly, and also the second half of the unit, apply much more widely than just to insurance models.

2.3.1 *Applied Probability* – 16 MT [Option BS3a if taken as half-unit]

Aims
This course is intended to show the power and range of probability by considering real examples in which probabilistic modelling is inescapable and useful. Theory will be developed as required to deal with the examples.

Synopsis
Poisson processes and birth processes. Continuous-time Markov chains. Transition rates, jump chains and holding times. Forward and backward equations. Class structure, hitting times and absorption probabilities. Recurrence and transience. Invariant distributions and limiting behaviour. Time reversal.

Applications of Markov chains in areas such as queues and queueing networks - M/M/s queue, Erlang's formula, queues in tandem and networks of queues, M/G/1 and G/M/1 queues; insurance ruin models; epidemic models; applications in applied sciences.

Renewal theory. Limit theorems: strong law of large numbers, strong law and central limit theorem of renewal theory, elementary renewal theorem, renewal theorem, key renewal theorem. Excess life, inspection paradox. Applications.

Reading
• J.R. Norris: *Markov Chains*. Cambridge University Press (1997)
• G.R. Grimmett and D.R. Stirzaker: *Probability and Random Processes*. 3rd edition, Oxford University Press (2001)
• G.R. Grimmett and D.R. Stirzaker: *One Thousand Exercises in Probability*. Oxford University Press (2001)
• S.M. Ross: I*ntroduction to Probability Models*. 4th edition, Academic Press (1989)
• D.R. Stirzaker: *Elementary Probability*. 2nd edition, Cambridge University Press (2003)

2.3.2 *Statistical Lifetime-Models* – 16 HT

Aims
The second half of the unit follows on from the first half on Applied Probability. Models introduced there are examined more specifically in the context of measuring 'lifetimes' in the broad sense. In a life insurance context Markov transitions may model the passage from 'alive' to 'dead', possibly with intermediate stages like 'loss of a limb' or 'critically ill'. The same models are used to model fertility transitions, the progress of a disease, and the reliability of a mechanical device. The aim is to develop statistical methods to estimate transition rates, and to use these transition rates to construct life tables that form the basis in the calculation of life insurance premiums and pension projections. We will also cover the basics of survival analysis, to model the influence of covariates (eg weight, smoking, use of a medication) on lifespans.

Synopsis
Life tables: Basic notation, life expectancy and remaining life expectancy, curtate lifetimes.
Census approximation, Lexis diagrams.
Survival models: general lifetime distributions, force of mortality (hazard rate), survival function, specific mortality laws, the single decrement model and mortality in mixed populations.

Estimation procedures for lifetime distributions: empirical lifetime distributions, censoring and truncation, Kaplan-Meier estimate, Nelson-Aalen estimate. Parametric models, accelerated life models including Weibull, log-normal, log-logistic. Plot-based methods for model selection. Proportional hazards, partial likelihood, semiparametric estimation of survival functions, use and overuse of proportional hazards in insurance calculations and epidemiology.
Two-state and multiple-state Markov models, with simplifying assumptions. Estimation of Markovian transition rates: Maximum likelihood estimators, time-varying transition rates, census approximation. Applications to reliability, medical statistics, ecology.

Graduation, including fitting Gompertz-Makeham model, comparison with standard life table: tests including chi-square test and grouping of signs test, serial correlations test; smoothness.

Demographic projection, Stable population age structures. Application to pension plans.

Reading
• Subject 104 [CT4] *Survival models [Modelling] Core Reading,* Faculty & Institute of Actuaries
• D.R. Cox and D. Oakes: *Analysis of Survival Data.* Chapman & Hall (1984)
Further Reading
• J.P. Klein and M.L. Moeschberger: *Survival Analysis*. Springer (1997)
• C.T. Le: *Applied Survival Analysis.* Wiley (1997)
• H.U. Gerber: *Life Insurance Mathematics*. 3rd edition, Springer (1997)
• N.L. Bowers et al.: *Actuarial mathematics*. 2nd edition, Society of Actuaries (1997)

2.4 **BS4 Actuarial Science**

Level: H-level
Method of Assessment: 3-hour examination
Prerequisites: Part A Probability is useful, but not essential. If you have not done Part A Probability, make sure that you are familiar with Mods work on Probability.

Weight: One unit.

2.4.1 *Actuarial Science I* – 16 MT

Aims
This unit is supported by the Institute of Actuaries. It has been designed to give the undergraduate mathematician an introduction to the financial and insurance worlds in which the practising actuary works. Students will cover the basic concepts of risk management models for investment and mortality, and for discounted cash flows. In the examination, a student obtaining at least an upper second class mark on this unit can expect to gain exemption from the Institute of Actuaries' paper CT1, which is a compulsory paper in their cycle of professional actuarial examinations.

Synopsis
Fundamental nature of actuarial work. Use of generalised cash flow model to describe financial transactions. Time value of money using the concepts of compound interest and discounting. Interest rate models. Present values and accumulated values of a stream of equal or unequal payments using specified rates of interest. Interest rates in terms of different time periods. Equation of value, rate of return of a cash flow, existence criteria.

Loan repayment schemes. Investment project appraisal, funds and weighted rates of return. Inflation modelling, inflation indices, real rates of return, inflation-adjustments. Valuation of fixed-interest securities, taxation and index-linked bonds.

Uncertain payments, corporate bonds, fair prices and risk.

Simple stochastic interest rate models, mean-variance models, log-normal models. Mean, variance and distribution of accumulated values of simple sequences of payments

Reading
All of the following are available from the Publications Unit, Institute of Actuaries, 4 Worcester Street, Oxford OX1 2AW

• Subject 102[CT1] *Financial Mathematics Core Reading* Faculty & Institute of Actuaries.
• J.J. McCutcheon and W.F. Scott: *An Introduction to the Mathematics of Finance*. Heinemann (1986)
• P. Zima and R.P. Brown: *Mathematics of Finance*. McGraw-Hill Ryerson (1993)
• H.U. Gerber: *Life Insurance Mathematics*. 3rd edition, Springer (1997)
• N.L. Bowers et al: *Actuarial mathematics*. 2nd edition, Society of Actuaries (1997)

2.4.2 *Actuarial Science II* – 16 HT

Synopsis
Investment, risk characteristics of investments, theories of value, and the desynchronising function of financial markets.

Term structure of interest rates, spot rates and forward rates and yield curves. Stability of investment portfolios, analysis of small changes in interest rates and Redington immunisation.

The no-arbitrage assumption, the law of one price, and arbitrage-free pricing. Price and value of forward contracts. Effect of fixed income or fixed dividend yield from the asset. Futures, options and other financial products.

Single decrement model. Present values and accumulated values of a stream of payments taking into account the probability of the payments being made according to a single decrement model. Annuity functions and assurance functions for a single decrement model. Risk and premium calculation.

Liabilities under a simple assurance contract or annuity contract. Premium reserves, Thiele's differential equation. Expenses and office premiums.

Reading
All of the following are available from the Publications Unit, Institute of Actuaries, 4 Worcester Street, Oxford OX1 2AW
• Subject 102[CT1] *Financial Mathematics Core Reading* Faculty & Institute of Actuaries .
• Subject CT5[105] *Contingencies Core Reading* Faculty & Institute of Actuaries.
• J.J. McCutcheon and W.F. Scott: *An Introduction to the Mathematics of Finance*. Heinemann (1986)
• H.U. Gerber: *Life Insurance Mathematics*. 3rd edition, Springer (1997)
• N.L. Bowers et al: *Actuarial mathematics*. 2nd edition, Society of Actuaries (1997)

3 Mathematical and Other units and half units

The other units and half units that students in Part B Mathematics and Statistics may take are drawn from Part B of the Honour School of Mathematics.
For full details of these units and half-units, see the Syllabus and Synopses for Part B of the Honour School of Mathematics, which are available on the web at
http://www.maths.ox.ac.uk/current-students/undergraduates/handbooks-synopses

3.1 *Mathematics units and half units*

The Mathematics units and half-units that are available are as follows:

B1 (or B1a or B1b) Logic and Set Theory
B2 (or B2a or B2b) Algebra
B3 (or B3a or B3b) Geometry
B4 (or B4a) Analysis
B5 (or B5a or B5b) Differential Equations and Applications
B6 (or B6a or B6b) Theoretical Mechanics
B7.1 (or B7.1a) Quantum Mechanics; Quantum Theory and Quantum Computers
B7.2 (or B7.2a) Relativity
B8 (or B8a or B8b) Topics in Applied Mathematics
B9 (or B9a) Number Theory
B10 (or B10a or B10b) Martingales and Financial Mathematics
B11a Communication Theory
B21 Numerical Solution of Differential Equations
C3.1 (or C3.1a or C3.1b) Topology & Groups and Algebraic Topology
(M-Level)
C3.2 (or C3.2a or C3.2b) Lie Groups and Differentiable Manifolds
C5.1a Methods of Functional Analysis for Partial Differential Equations
(M-level)
BE "Mathematical" Extended Essay

(These are the units referred to in Section 1, item (d), as 'Mathematics Department units and half units' for Part B of the Honour School of Mathematics.)

See the "Projects Guidance Notes" on the web at
http://www.maths.ox.ac.uk/current-students/undergraduates/projects/
for more information on the Extended Essay option and an application form.

Please note that the following **are not permitted options** in Part B of the Honour School of Mathematics and Statistics:
OE Other Mathematical Extended Essay
B22a Integer Programming.

3.2 *Other units and half units*

The other half unit which is available is as follows:
N1 Undergraduate Ambassadors' Scheme
(a half-unit, details in the Syllabus and Synopses for Part B of the Honour School of Mathematics)

4. Registration for Part B courses 2009–2010

We ask that students register in advance for the classes they wish to take, by Friday of week 9 Trinity Term 2009, using the form overleaf.

Because of the large number of options which are available in Part B, some lectures will clash. See the Syllabus and Synopses for Part B of the Honour School of Mathematics for information on which lectures may clash. http://www.maths.ox.ac.uk/current-students/undergraduates/handbooks-synopses

REGISTRATION FORM: PART B CLASSES 2009-2010

SURNAME . . . . . .

FIRST NAME . . . . . .

EMAIL ADDRESS . . . . . .

COLLEGE . . . . . .

Note: As described in Section 1, you need to do a total of 4 units in Part B: all Mathematics and Statistics students do the unit BS1, and also at least one unit from the units and half-units available under BS2 and BS3.

For the Statistics units BS1–BS4, and the Mathematics or Other units, please give details of subjects in which you wish to take classes.

I wish to take classes in the following subjects: [Please Tick]

☑ BS1 Applied Statistics (MT and HT, compulsory for Mathematics and Statistics students)

☐ BS2a Foundations of Statistical Inference (MT, half-unit only)

☐ BS3 Stochastic Modelling (MT and HT)

☐ BS3a Applied Probability (MT, half-unit only)

☐ BS4 Actuarial Science (MT and HT)

For Mathematics or Other units or half-units, please list the unit or half-unit code and name:
Unit code Unit name

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Please return this form to the Academic Administrator, Department of Statistics, 1 South Parks Road, by Friday of week 9 Trinity Term 2009.