Lectures proposed by the Board of the Faculty of Mathematics

MATHEMATICAL TRIPOS

Lectures proposed by the Board of the Faculty of Mathematics. Graduates of the University who are not reading for any University Examination may attend without payment any lectures proposed by the Faculty Board of Mathematics.

Part IA students are recommended to attend the induction session which will be held from 9.30 a.m. to 10.45 a.m. on Wednesday 6 October 2010, *in the Cockcroft Lecture Theatre.*

A meeting will be held for all Part IA students on Friday 6 May 2011 at 2.00 p.m. in *Mill Lane Room 3* to discuss examinations and examination techniques.

Note that the non-examinable course on **Topics in the History of Mathematics** will be of interest to all students reading the Mathematical Tripos. Full details are given below.

MICHAELMAS 2010 **LENT 2011** **EASTER 2011**

PART IA

Lectures for Part IA of the Mathematical Tripos will be held in the *Cockcroft Lecture Theatre* unless otherwise stated.

Numbers and Sets
PROF. A. G. THOMASON
M. W. F. 10
Groups
PROF. J. SAXL
M. W. F. 11
Vectors and Matrices
DR S. J. COWLEY
Tu. Th. S. 10
Differential Equations
PROF. M. G. WORSTER
Tu. Th. S. 11

The following courses are non-examinable

Introduction to Mechanics
DR S. T. C. SIKLOS
Tu. Th. 12, *Arts School, Room B, Bene't Street* (Ten lectures)
Topics in the History of Mathematics: Ancients to the Renaissance
DR P. BURSILL-HALL
W. F. 4, *Centre for Mathematical Sciences, MR3*

Vector Calculus
DR J. M. EVANS
M. W. F. 11
Dynamics and Relativity
DR S. T. C. SIKLOS
M. W. F. 12, *Arts School, Room A, Bene't Street*
Analysis I
PROF. G. P. PATERNAIN
Tu. Th. S. 10
Probability
PROF. G. R. GRIMMETT
Tu. Th. S. 11

The following course is non-examinable

Topics in the History of Mathematics: Renaissance to the 19th Century
DR P. BURSILL-HALL
W. F. 4, *Centre for Mathematical Sciences, MR3*

Metric and Topological Spaces*
DR I. SMITH
M. W. F. 9, *Mill Lane Room 3* (Twelve lectures)
Variational Principles*
DR D. M. A. STUART
M. W. F. 10, *Mill Lane Room 3* (Twelve lectures)
Optimisation*
PROF. Y. M. SUHOV
M. W. F. 11, *Mill Lane Room 3* (Twelve lectures)
Computational Projects*
DR S. J. COWLEY
Tu. Th. 10 (Eight lectures)

The following courses are non-examinable

Topics in the History of 19th Century Mathematics
DR P. BURSILL-HALL ET AL.
W. F. 4, *Centre for Mathematical Sciences, MR3*
Concepts in Theoretical Physics
DR N. G. BERLOFF ET AL.
Tu. Th. 11 (Eight lectures)

* Examined in Part IB of the Tripos

Mathematics with Physics Option:

Students taking this third option should attend Vectors and Matrices, Groups, Differential Equations, Analysis I, Vector Calculus and Probability from Part IA of the Mathematical Tripos, together with the lectures listed page 165 in Part IA Physics of the Natural Sciences Tripos. They will be required to do Physics practical work, and should attend at least the first lecture of Course B of the Computing Course for Physical Scientists.

Faculty of Mathematics (continued)

MATHEMATICAL TRIPOS, PART IB

Lectures for Part IB of the Mathematical Tripos will be held in *Mill Lane Lecture Rooms*, *Room 3* unless otherwise stated.

MICHAELMAS 2010

Methods
PROF. R. JOZSA
M. W. F. 9

Analysis II
PROF. A. J. SCHOLL
M. W. F. 10

Linear Algebra
DR T. A. FISHER
M. W. F. 11

Markov Chains
PROF. F. P. KELLY
Tu. Th. 10 (Twelve lectures)

Quantum Mechanics
PROF. N. DOREY
Tu. Th. 11

The following course is non-examinable

Topics in the History of Mathematics: Ancients to the Renaissance
DR P. BURSILL-HALL
W. F. 4, *Centre for Mathematical Sciences, MR3*

LENT 2011

Complex Analysis
PROF. J. M. E. HYLAND
M. F. 9

Groups, Rings and Modules
DR R. D. CAMINA
M. W. F. 10

Statistics
DR R. J. SAMWORTH
M. W. 11

Complex Methods
PROF. G. W. GIBBONS
M. W. 12

Geometry
PROF. B. J. TOTARO
Tu. Th. 9

Numerical Analysis
DR S. J. COWLEY
Tu. Th. 10

Electromagnetism
DR N. G. BERLOFF
Tu. Th. 11

Fluid Dynamics
PROF. H. E. HUPPERT
Tu. Th. 12

The following course is non-examinable

Topics in the History of Mathematics: Renaissance to the 19th Century
DR P. BURSILL-HALL
W. F. 4, *Centre for Mathematical Sciences, MR3*

EASTER 2011

Metric and Topological Spaces
DR I. SMITH
M. W. F. 9 (Twelve lectures)

Variational Principles
DR D. M. A. STUART
M. W. F. 10 (Twelve lectures)

Optimisation
PROF. Y. M. SUHOV
M. W. F. 11 (Twelve lectures)

The following course is non-examinable

Topics in the History of 19th Century Mathematics
DR P. BURSILL-HALL ET AL.
W. F. 4, *Centre for Mathematical Sciences, MR3*

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Faculty of Mathematics (continued)

MATHEMATICAL TRIPOS, PART II

Lectures will be held in the Meeting Rooms (MR) of the *Centre for Mathematical Sciences, Clarkson Road,* unless otherwise stated.

A meeting will be held on Wednesday 15 June 2011 for finalists who may continue to Part III of the Tripos in 2011–12. The meeting will be held in *MR2 at the Centre for Mathematical Sciences* at 11.15 a.m.

MICHAELMAS 2010	LENT 2011	EASTER 2011

C COURSES

Cosmology
PROF. E. P. S. SHELLARD
M. W. F. 10, *MR3*

Dynamical Systems
PROF. M. R. E. PROCTOR
Tu. Th. S. 9, *MR3*

Topics in Analysis
DR N. WICKRAMASEKERA
Tu. Th. S. 10, *MR4*

Number Theory
PROF. J. H. COATES
Tu. Th. S. 11, *MR2*

Classical Dynamics
DR P. D. D'EATH
Tu. Th. S. 12, *MR3*

Computational Projects
DR S. J. COWLEY
M. 11 Oct. 2–3.30, *MR2* (One lecture)

Statistical Modelling
DR R. NICKL AND DR J. COSMA
M. W. F. 9, *MR4*

Coding and Cryptography
PROF. T. W. KÖRNER
M. W. F. 10, *MR4*

Further Complex Methods
PROF. A. FOKAS
M. W. F. 12, *MR3*

Mathematical Biology
PROF. P. H. HAYNES
Tu. Th. S. 9, *MR4*

Geometry and Groups
DR T. K. CARNE
Tu. Th. S. 11, *MR3*

D COURSES

Fluid Dynamics
PROF. E. J. HINCH
M. W. F. 9, *MR3*

Linear Analysis
PROF. B. J. GREEN
M. W. F. 9, *MR4*

Logic and Set Theory
PROF. I. B. LEADER
M. W. F. 10, *MR2*

Principles of Statistics
PROF. A. P. DAWID
M. W. F. 10, *MR4*

Galois Theory
DR T. YOSHIDA
M. W. F. 11, *MR3*

Partial Differential Equations
PROF. P. A. MARKOWICH
M. W. F. 11, *MR4*

Principles of Quantum Mechanics
PROF. B. ALLANACH
M. W. F. 12, *MR2*

Probability and Measure
DR N. BERESTYCKI
M. W. F. 12, *MR3*

Riemann Surfaces
PROF. P. M. H. WILSON
Tu. Th. 9, *MR4*

Optimisation and Control
PROF. R. R. WEBER
Tu. Th. 9, *MR5*

General Relativity
DR R. M. WILLIAMS
Tu. Th. 10, *MR2*

Electrodynamics
PROF. M. J. PERRY
Tu. Th. 11, *MR3*

Graph Theory
DR P. A. RUSSELL
Tu. Th. S. 12, *MR2*

The following courses are non-examinable

Laboratory Demonstrations in Fluid Dynamics
DR S. B. DALZIEL
Tu. or Th. 2, *Fluids Laboratory* (Four sessions, beginning 21 or 26 Jan.)

Topics in the History of Mathematics: Ancients to the Renaissance
DR P. BURSILL-HALL
W. F. 4, *MR3*

Waves
PROF. J. R. LISTER
M. W. F. 9, *MR3*

Differential Geometry
DR A. G. KOVALEV
M. W. F. 9, *MR2*

Statistical Physics
DR D. TONG
M. W. F. 10, *MR3*

Stochastic Financial Models
PROF. L. C. G. ROGERS
M. W. F. 11, *MR3*

Numerical Analysis
DR C. B. SCHOENLIEB
M. W. F. 11, *MR5*

Representation Theory
DR S. MARTIN
M. W. F. 12, *MR4*

Applied Probability
PROF. Y. M. SUHOV
M. W. F. 12, *MR5*

Algebraic Topology
PROF. P. T. JOHNSTONE
Tu. Th. S. 9, *MR3*

Integrable Systems
DR M. DUNAJSKI
Tu. Th. 10, *MR3*

Number Fields
PROF. N. I. SHEPHERD-BARRON
Tu. Th. 10, *MR4*

Asymptotic Methods
PROF. N. S. MANTON
Tu. Th. 11, *MR4*

Applications of Quantum Mechanics
PROF. R. R. HORGAN
Tu. Th. S. 12, *MR2*

Algebraic Geometry
PROF. I. GROJNOWSKI
Tu. Th. S. 12, *MR3*

The following course is non-examinable

Topics in the History of Mathematics: Renaissance to the 19th Century
DR P. BURSILL-HALL
W. F. 4, *MR3*

The following course is non-examinable

Topics in the History of 19th Century Mathematics
DR P. BURSILL-HALL ET AL.
W. F. 4, *MR3*

Faculty of Mathematics (continued)

MATHEMATICAL TRIPOS, PART III

All lectures are held at the *Centre for Mathematical Sciences, Clarkson Road* unless otherwise stated. There will be a meeting in *MR2* on Wednesday 6 October 2010 at 9.30 a.m. for all those who intend to offer courses in Part III.

There is a series of meetings for Part III students in MR2, Centre for Mathematical Sciences on Wednesdays at 4.15 p.m. Students are invited to refer to the Part III Handbook for more details.

MICHAELMAS 2010

Algebraic Topology
DR I. SMITH
M. W. F. 9, *MR2*
Statistical Field Theory
PROF. R. R. HORGAN
M. W. 9, *MR5*
Geophysical and Environmental Fluid Dynamics
DR S. B. DALZIEL
M. W. F. 9, *MR11*
Statistical Theory
DR R. NICKL
M. W. F. 9, *MR12*
Cosmology
PROF. J. D. BARROW AND DR A. D. CHALLINOR
M. W. F. 10, *MR5*
Category Theory
PROF. P. T. JOHNSTONE
M. W. F. 10, *MR9*
Slow Viscous Flow
PROF. J. R. LISTER
M. W. F. 10, *MR11*
Quantum Information Theory
DR N. DATTA, DR B. GROISMAN AND DR J. OPPENHEIM
M. W. F. 10, *MR12*
Differential Geometry
DR A. G. KOVALEV
M. W. F. 10, *MR13*
Reaction-Diffusion Equations
DR K. FELLNER
M. W. 10, *MR14*
General Relativity
DR H. S. REALL
M. W. F. 11, *MR2*
Introduction to Lie Algebras and their Representations
PROF. I. GROJNOWSKI
M. W. F. 11, *MR9*
Advanced Probability
DR I. BAILLEUL
M. W. F. 11, *MR12*
Numerical Solution of Differential Equations
PROF. A. ISERLES
M. W. F. 11, *MR14*
Mathematics of Operational Research
PROF. R. R. WEBER
M. W. F. 12, *MR4*
Algebraic Geometry
PROF. B. J. TOTARO
M. W. F. 12, *MR5*
Symmetries and Particles
PROF. M. B. GREEN
M. W. F. 12, *MR9*
Astrophysical Fluid Dynamics
PROF. J. C. B. PAPALOIZOU
M. W. F. 12, *MR11*
Semigroups of Operators
DR D. J. H. GARLING
M. W. F. 12, *MR13*
Soft Matter and Biological Physics
DR U. F. KEYSER
M. W. F. 12.10, *Cavendish Laboratory*
Control of Quantum Systems
DR S. G. SCHIMER
M. W. 2, *MR14*
Quantum Field Theory
PROF. N. S. MANTON
Tu. Th. S. 9, *MR2*
Advanced Financial Models
DR M. TEHRANCHI
Tu. Th. S. 9, *MR9*
Combinatorics
PROF. I. B. LEADER
Tu. Th. 10, *MR3*

LENT 2011

Topics in Representation Theory
DR C. J. B. BROOKES
M. W. F. 9, *MR9*
Stellar and Planetary Magnetic Fields
PROF. M. R. E. PROCTOR
M. W. F. 9, *MR11*
Biostatistics
DR P. TREASURE
M. W. F. 9, *MR12* (Ten lectures, beginning 21 Jan., and two classes)
PROF. D. SPIEGELHALTER, PROF. S. BIRD AND PROF. V. T. FAREWELL
W. 4–6 (Weeks 1–3)
Hodge Theory
DR A.-S. KALOGHIROS
M. W. F. 9, *MR13*
Applications of Differential Geometry to Physics
PROF. G. W. GIBBONS
M. W. F. 9, *MR14*
Solidification of Fluids
PROF. M. G. WORSTER AND DR J. A. NEUFELD
M. W. F. 9, *MR15*
Topos Theory
DR O. CARAMELLO
M. W. F. 10, *MR5*
String Theory
PROF. M. J. PERRY
M. W. F. 10, *MR2*
Analytic Topics in Group Theory
PROF. B. J. GREEN
M. W. F. 10, *MR9*
Dynamics of Astrophysical Discs
DR G. I. OGILVIE
M. W. 10, *MR11*
Applied Bayesian Statistics
PROF. D. SPIEGELHALTER
M. W. 10, *MR12* (Eleven lectures), *CATAM Room* (Five classes)
Galois Cohomology
DR C. VIAL
M. W. F. 10, *MR13*
Fluid Dynamics of Energy
DR C. P. CAULFIELD AND PROF. A. W. WOODS
M. W. F. 10, *MR15*
Supersymmetry
PROF. B. ALLANACH
M. W. 11, *MR2*
Stochastic Networks
PROF. F. P. KELLY
M. W. F. 11, *MR4*
Elliptic Curves
DR T. DOKCHITSER
M. W. F. 11, *MR9*
Galaxies
DR S. C. CHAPMAN
M. W. F. 11, *MR11*
Spectral Geometry
DR D. BARDEN
M. W. F. 11, *MR13*
Kac-Moody and Vivasoro Algebras
DR A. J. WASSERMANN
M. W. F. 12, *MR2*
Applied Statistics
DR B. D. TOM
M. W. 12, *MR9* (Four lectures), 2–4 (Four classes)
Morse Homology
DR A. F. RITTER
M. W. F. 12, *MR12*

EASTER 2011

Solitons
DR D. M. STUART
M. Tu. Th. F. 12, *MR11*
Quantum Foundations
DR A. P. A. KENT
M. W. 2–4, *MR12*

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Faculty of Mathematics (continued)

MATHEMATICAL TRIPOS, PART III (continued)

MICHAELMAS 2010	LENT 2011	EASTER 2011
Physical Cosmology PROF. M. PETTINI Tu. Th. S. 10, *MR5* **Topics in Analysis** PROF. T. W. KÖRNER M. W. F. 9, *MR9* **Local Fields** DR T. A. FISHER Tu. Th. 10, *MR13* **Structure and Evolution of Stars** DR J. J. ELDRIDGE Tu. Th. S. 11, *MR5* **Algebraic Number Theory** DR V. DOKCHITSER Tu. Th. S. 11, *MR9* **Percolation and Related Topics** PROF. G. R. GRIMMETT Tu. Th. 11, *MR12* **Commutative Algebra** DR S. J. WADSLEY Tu. Th. S. 12, *MR4* **Perturbation and Stability Methods** PROF. J. M. RALLISON AND PROF. N. PEAKE Tu. Th. S. 12, *MR11* **Time Series and Monte Carlo Inference (I) +** DR S. M. PITTS Tu. S. 12, *MR12* (Eight lectures) **Analysis of Boolean Functions** DR T. SANDERS Tu. Th. 12, *MR13* **Applied Statistics** DR S. M. PITTS Th. 12, *MR12* (Eight lectures), Tu. 2–4 (Eight classes)	**Decision Problems in Group Theory** DR A. M. W. GLASS M. W. F. 12, *MR13* **Planetary System Dynamics** DR M. C. WYATT M. W. F. 12, *MR14* **Quantum Computation** PROF. R. JOZSA AND DR A. SHORT M. W. 12, *MR15* **The Standard Model** PROF. H. OSBORN Tu. Th. S. 9, *MR2* **Extremal Graph Theory** DR D. CONLON Tu. Th. 12, *MR4* **Binary Stars** DR C. A. TOUT Tu. Th. 9, *MR11* **Time Series and Monte Carlo Inference (II) +** PROF. A. P. DAWID Tu. 9, *MR12* **Free Boundary Problems and Applications** DR N. MATEVOSYAN Tu. Th. 9, *MR13* **Recursion Theory** DR T. E. FORSTER Tu. Th. 9, *MR14* **Black Holes** PROF. P. K. TOWNSEND Tu. Th. S. 10, *MR2* **Schramm-Loewner Evolutions** DR N. BERESTYCKI Tu. Th. 10, *MR12* **Non-Newtonian Fluid Dynamics** PROF. E. J. HINCH Tu. Th. 10, *MR14* **Advanced Quantum Field Theory** PROF. N. DOREY Tu. Th. S. 11, *MR2* **Modular Forms** PROF. A. J. SCHOLL Tu. Th. S. 11, *MR5* **Optimal Investment** PROF. L. C. G. ROGERS Tu. Th. 11, *MR9* **Analytical Methods for Boundary Value Problems and Medical Imaging** PROF. A. FOKAS M. W. 9, *MR5* **Stochastic Calculus** DR M. TEHRANCHI Tu. Th. S. 12, *MR5* **Advanced Cosmology** PROF. E. P. S. SHELLARD AND DR E. LIM Tu. Th. 12, *MR9* ***The following course is non-examinable*** **Demonstrations in Fluid Dynamics** DR S. B. DALZIEL Th. 2, *Fluids Laboratory*	

+ These two courses constitute the sixteen-hour course in Time Series and Monte Carlo Inference.

Faculty of Mathematics (continued)

COURSES INTENDED FOR GRADUATES (NON-EXAMINABLE)

MICHAELMAS 2010

Modul Spaces in Algebraic Geometry
PROF. N. I. SHEPHERD-BARRON
M. W. F. 12, *MR12*

Set Theory
PROF. A. R. D. MATHIAS
M. W. F. 12, *MR14*

Sigma Models and Mirror Symmetry
DR J. MCORIST
M. 2, *MR9*

Control of Quantum Sytems
DR S. G. SEHIVMER
M. W. 2, *MR14*

Sporadic and Related Groups
DR R. PARKER
Tu. Th. 9, *MR13*

Topics in Theoretical Physics
PROF. M. J. PERRY AND PROF. G. W. GIBBONS
Tu. 2, *MR9*

Elementary Measure Theory and Related Topics
PROF. T. W. KÖRNER
Tu. 3–5, *MR15*

Philosophy of Physics
DR J. N. BUTTERFIELD
Th. 4.30–6, *MR13*

LENT 2011

L-Functions
PROF. J. H. COATES
M. W. F. 12, *MR11*

Algebraic Methods in Combinatorics
DR D. C. ELLIS
Tu. Th. 10, *MR9*

Galois Modules
DR H. JOHNSTON
Tu. Th. 10, *MR11*

Topics in Geometric Analysis
DR N. WICKRAMASEKERA
Tu. Th. 11, *MR11*

Quantum Fluids
DR N. G. BERLOFF
Tu. Th. 11, *MR14*

Class Field Theory
DR T. YOSHIDA
Tu. Th. S. 12, *MR12*

Sequential Monte Carlo Methods
DR J. COSMA
Tu. Th. 2, *MR4* (Eight lectures, beginning 10 Feb.)

Topics in Theoretical Physics
PROF. M. J. PERRY AND PROF. G. W. GIBBONS
Tu. 2, *MR9*

Frequentist Analysis of Nonparametric Bayes Procedures
DR R. NICKL
Tu. 2–4, *MR12* (Eight lectures)

Causal Inference
PROF. A. P. DAWID
Th. 2, *MR12*

Philosophy of Physics
DR J. N. BUTTERFIELD
W. 4.30–6, *MR13*

EASTER 2011

Computational Geometry
DR B. BUKH
M. W. F. 10, *MR4*

Gowers Uniformity Norms and Nilsequences
DR P. CANDELA
M. W. F. 11, *MR4*

Discrete Gravity
DR R. M. WILLIAMS AND DR B. BAHR
M. W. F. 11, *MR9*

Foliations on Three-Manifolds
DR A. JUHÁSZ
M. 2.30–4, *MR4*

Lie Groups and Differential Equations
DR M. DUNAJSKI
Tu. Th. 2, *MR9*

Hamiltonian Quantisation of Constrained Systems
DR P. D. D'EATH
W. F. 2, *MR11*

M.PHIL. IN COMPUTATIONAL BIOLOGY

Lectures are held in *the Centre for Mathematical Sciences,* unless otherwise stated.

Functional Genomics
DR B. CARVALHO, DR O. RUEDA, DR R. STARK
W. 10, *MR15*, 11, *CATAM Room*, F. 10, *MR15*

Genome Informatics
DR G. MICKLEM ET AL.
M. 10, *MR15*, 11, *CATAM Room*, Th. 3, MR15

Computational Neuroscience
DR S. EGLEN
Tu. Th. 10, *MR15*

Scientific Programming
DR S. EGLEN
M. 1, *MR15*, Tu. Th. 12, *MR15*, 1, *CATAM Room* (weeks 1–3)

TBC
PROF. S. TAVARÉ
Tu. 9–12, *MR15*

Network Biology
PROF. L. WERNISCH AND DR F. MARKOWETZ
W. F. 11, *MR15*

Sequence Analysis
DR A. SCALLY
M. F. 3, *MR15*

Systems Biology
DR J. PAULSSON AND DR A. HILFINGER
M. Tu. W. Th. 2–4 (weeks 1–2)

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