

NATURAL SCIENCES TRIPOS, PART IA

MICHAELMAS 2005

LENT 2006

EASTER 2006

BIOLOGY OF CELLS

Course Organiser: Dr J. P. Carr (email: john.carr@plantsci.cam.ac.uk)
 Course Website: www.bio.cam.ac.uk/teaching/cells/

All lectures take place in the Babbage Lecture Theatre, New Museums Site on M. W. F. 10

DR S. H. P. MADDRELL

The Living Cell. (Four lectures, beginning 7 Oct.)

PROF. D. J. ELLAR

Macromolecules in the Cell. (Five lectures, beginning 17 Oct.)

PROF. R. A. LEIGH

Membranes: Molecular Superstructures. (Five lectures, beginning 28 Oct.)

DR A. SMITH AND DR J. GRIFFIN

The Chemistry of Life. (Ten lectures, beginning 9 Nov.)

DR D. K. SUMMERS

Hunting the Gene. (Seven lectures, beginning 20 Jan.)

DR M. WELCH

Genes in Action. (Six lectures, beginning 6 Feb.)

PROF. D. GLOVER

The Genetic Revolution. (Six lectures, beginning 20 Feb.)

PROF. R. A. LASKEY

Cell Proliferation. (Five lectures, beginning 6 Mar.)

DR A. WEBB

Cell Signalling. (Six lectures, beginning 28 Apr.)

PROF. J. SMITH

Development. (Six lectures, beginning 12 May)

Practical work takes place in the *Zoological Laboratory* at 11–1 and 2–4 on M. or W. or F. For those doing Geology, practical times are 12–1 and 2–5; and for those doing Materials and Mineral Sciences times are 11–2 and 2–5.

CHEMISTRY

Course Organiser: Dr J. H. Keeler (email: James.Keeler@ch.cam.ac.uk)
 Course Website: www-teach.ch.cam.ac.uk/

All lectures will be given in Bristol-Myers Squibb Lecture Theatre, Department of Chemistry, Lensfield Road on Tu. Th. S. 10

DR P. D. WOTHERS

Shapes and Structures of Molecules. (Nineteen lectures)

DR W. P. NOLAN

Reactions and Mechanisms in Organic Chemistry. (Five lectures)

DR W. P. NOLAN

Reactions and Mechanisms in Organic Chemistry. (Nine lectures, continued)

DR J. H. KEELER

Energetics and Equilibria. (Nine lectures)

DR S. CLARKE

Kinetics of Reactions. (Six lectures)

DR P. D. WOTHERS

Chemistry of the Elements. (Twelve lectures)

Practical Chemistry: M. Tu. W. Th. F. 11–1 and 2–5. Students will be assigned attendance on the morning and afternoon periods of one particular day in either odd weeks (beginning Th. 6 Oct.) or even weeks (beginning Th. 13 Oct.) of the Michaelmas term. Students should come to the *Department of Chemistry, Lensfield Road*, between 8.30 and 4.30 on Tu. 4 Oct. to collect various materials (handouts, practical manuals etc.) which they will need for the course.

ELEMENTARY MATHEMATICS FOR BIOLOGISTS

Course Organiser: Dr R. W. Broadhurst (email: rwb1002@cam.ac.uk)
 Course Website: www.phar.cam.ac.uk/teaching/EMB/

Elementary Mathematics for Biologists is intended for students who do not have A-level Mathematics.

Lectures will be given at 9 a.m. in the Rayleigh Lecture Theatre, New Museums Site

DR J. KOENIG

Introduction. (One lecture, 7 Oct.) F.

DR J. KOENIG

Algebra, Units and Graphs. (Three lectures, 12–26 Oct.) W.

DR J. ROGERS

Trigonometry, Oscillations and Waves. (Three lectures, 28 Oct.–4 Nov.) M. F.

PROF. P. A. MCNAUGHTON

Logarithms and Raising to Powers. (Two lectures, 7–11 Nov.) M. F.

DR R. W. BROADHURST

Calculus I. (Five lectures, 14–28 Nov.) M. F.

DR F. H. KING

Introduction to Computing and Excel. (Five sessions, 10–24 Oct.) M. F. 8.30–10 *Titan Rooms 1 and 2, New Museums Site*

THE LECTURERS

Examples classes (Five classes, 2 Nov.–30 Nov.) W. 9 *Large Classroom, Department of Pharmacology*

DR R. W. BROADHURST

Calculus II. (Six lectures, 20 Jan.–6 Feb.) M. F.

DR M. AITKEN

Statistics. (Ten lectures, 10 Feb.–13 Mar.) M. F.

DR M. AITKEN

Curve Fitting. (Two lectures, 28 Apr.–1 May) M. F.

PROF. P. A. MCNAUGHTON

Frequency Analysis. (Two lectures, 5–8 May) M. F.

THE LECTURERS

Revision lectures. (Three lectures, 12–19 May) M. F.

THE LECTURERS

Revision lectures. (Three lectures, 12–19 May) M. F.

THE LECTURERS

Revision lectures. (Three lectures, 12–19 May) M. F.

THE LECTURERS

Examples classes (Eight classes, 25 Jan.–15 Mar.) W. 9 *Large Classroom, Department of Pharmacology*

THE LECTURERS

Examples classes (Two classes, 3, 10 May) W. 8.30–10 *PWF facility, Titan Rooms*, (Two classes, 17, 24 May) W. 9 *Large Classroom, Department of Pharmacology*

Examples classes: Two of the exercises in each of the Michaelmas and Lent terms and one from the Easter term will be assessed with marks counting towards the examination.

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NATURAL SCIENCES TRIPOS, PART IA (continued)

MICHAELMAS 2005

LENT 2006

EASTER 2006

EVOLUTION AND BEHAVIOUR

Course Organiser: Dr R. Preece (email: r.c.preece@zoo.cam.ac.uk)
 Course Website: www.zoo.cam.ac.uk/degree/1aevo/

All lectures are held on Tu. Th. S. at 11 in the Main Lecture Theatre, Department of Zoology

DR W. A. FOSTER

Introduction to Evolutionary Biology. (Four lectures, beginning 6 Oct.)

DR M. MATERUS

Evolutionary Genetics. (Eight lectures, beginning 15 Oct.)

DR C. HOWE

Early Events in Evolution. (Three lectures, beginning 3 Nov.)

PROF. J. PARKER

The Origin and Evolution of Plants. (Five lectures, beginning 10 Nov.)

PROF. J. PARKER

Diversification of Angiosperms. (Four lectures, beginning 22 Nov.)

PROF. M. E. AKAM

The Organisation of Animal Diversity. (Six lectures, beginning 19 Jan.)

DR R. S. K. BARNES

Major Changes and Major Constraints in Animal Evolution. (Six lectures, beginning 2 Feb.)

DR N. CLAYTON, PROF. E. B. KEVERNE AND PROF. A. DICKINSON

Evolution of Behaviour. (Twelve lectures, beginning 16 Feb.)

PROF. A. DICKINSON, DR N. CLAYTON AND DR M. PETRAGLIA

Primate and Human Evolution and Behaviour. (Twelve lectures, beginning 27 Apr.)

Practical work: M. 12–5 (alternate weeks) or Tu. 12–5 (alternate weeks) *Department of Zoology.*

GEOLOGY

Course Organiser: Dr N. Hovius (email: nhovius@esc.cam.ac.uk)
 Course Website: www.esc.cam.ac.uk/new/v10/teaching/geology/ia/courses.html

All lectures are given in the Physiology Lecture Room, adjacent to the Department of Earth Sciences, on M. W. F. 11

PROF. J. A. JACKSON, DR S. A. T. REDFERN AND DR D. M. PYLE

Earth as a Planet and Volcanic Processes. (Twenty-four lectures)

DR N. HOVIUS

Earth Surface Processes and Sediments. (Eleven lectures)

PROF. S. CONWAY-MORRIS

Palaeobiology. (Twelve lectures)

DR N. H. WOODCOCK

Introduction to Geology of Arran. (One lecture)

Field Course in Arran

Party A. 16–24 March

Party B. 23–31 March

Party C. 30 March–7 April

DR N. H. WOODCOCK

Britain's Geology: Solving the Jigsaw. (Five lectures)

PROF. S. CONWAY MORRIS AND DR A. DEUSS

Planet Earth: the Bigger Picture. (Seven lectures)

Practical work: There are three one-hour practicals to be taken per week: students choose one from each set (Set 1: F. 12, S. 10, M. 9, M. 10; Set 2: M. 12, Tu. 10, W. 9, W. 10; Set 3: W. 12, Th. 10, F. 9, F. 10).

Long Vacation Course: A course on Geological Field Methods will be given 18–28 September 2006 for students intending to take a geological subject in Part IB.

MATERIALS AND MINERAL SCIENCES

Readers of the Lecture-List are advised to contact the Department for details

NATURAL SCIENCES TRIPOS, PART IA (continued)

MICHAELMAS 2005

LENT 2006

EASTER 2006

MATHEMATICS

Course Organiser: (email: nst@maths.cam.ac.uk)
 Course Website: www.maths.cam.ac.uk/undergrad/NST/sched/node02.html

All students should also attend at least the first lecture of the Computing Course for Physical Scientists given in the Michaelmas Term (see below).

All lectures are held on Tu. Th. S. and will start at 9 a.m. promptly.

Course A

DR I. R. PARRY

Mathematics I. *Zoology Lecture Theatre*

Examples Class W. 4.30–6 (Two classes, 9, 23 Nov.) *Arts School, Room A*

DR M. J. PERRY

Mathematics II. (Sixteen lectures, ending 23 Feb.) *Zoology Lecture Theatre*

Examples Class W. 4.30–6 (Two classes, 1, 15 Feb.) *Arts School, Room A*

DR H. E. MASON

Mathematics III. (Twelve lectures) *Zoology Lecture Theatre***Course B**

DR R. ANSORGE

Mathematics I. *Chemical Laboratory*

Examples Class W. 4.30–6 (Four classes, 19 Oct., 2, 16, 30 Nov.) *Arts School, Room A*

PROF. P. H. HAYNES

Mathematics II. (Sixteen lectures, ending 23 Feb.) *Chemical Laboratory*

Examples Class W. 4.30–6 (Two classes, 8, 22 Feb.) *Arts School, Room A*

PROF. R. R. HOGAN

Mathematics III. (Twelve lectures) *Chemical Laboratory*

DR F. H. KING

Computing Techniques and Applications.

(Six lectures, beginning 25 Feb.) *Chemical Laboratory*

Practical work see comment below

Associated with the Computing Techniques and Applications course there will be an assessed computing exercise which will be taken into account by the Examiners. The assessments will take place in the afternoons of 8, 9 and 10 May 2006 in the *Foyer of the Babbage Lecture Theatre*. Further details will be issued during the first lecture of the Computing Course for Physical Scientists (see below).

COMPUTING COURSE FOR PHYSICAL SCIENTISTS

Course A is intended to be that which is normally taken. **Course B** takes place outside lecture term and is intended for undergraduates reading *Evolution and Behaviour*. The two courses will be identical in content.

Course A

DR F. H. KING

Scientific Computing. Tu. S. 11 (Six lectures, beginning 8 Nov.) or Th. S. 11 (Six lectures, beginning 10 Nov.) *Chemical Laboratory*

Practical work: Registration for a total of one hour of formal practical work will take place in the first lecture. The computing facilities used for the practical work will be available for informal use throughout the year.

Course B

DR F. H. KING

Scientific Computing. Th. F. 9 (Two days, beginning 1 Dec.) *Titan Teaching Room 2, New Museums Site*

Practical work: Formal practical work will be included in the two-day period. The computing facilities used for the practical work will be available for informal use throughout the year.

NATURAL SCIENCES TRIPOS, PART IA (continued)

MICHAELMAS 2005

LENT 2006

EASTER 2006

PHYSICS

Course Organiser: Dr G. A. C. Jones (email: IA-physics@phy.cam.ac.uk)
 Course Website: www.phy.cam.ac.uk/teaching/

Courses A and B are alternatives which cover the same syllabus. Those intending to continue with physics in later years can attend either course without disadvantage. **Course A** may be more suitable for students who took single-subject mathematics at A-level. Students are recommended to attend **course PC** 'Computing Course for Physical Scientists' (see p. 171) unless they are familiar with spreadsheets and computer-aided algebra.

All lectures are on M. W. F. at 9

Course A is given in the *Cockcroft Lecture Theatre, New Museums Site*;

Course B is given in the *Chemical Laboratory, Lensfield Road*

Course A

DR D. A. GREEN
 Mechanics and Relativity. (First twenty lectures)
 DR G. A. C. JONES
 Fields, Oscillations and Waves. (Last four lectures,
 beginning 23 Nov.)

Course B

DR P. J. DUFFETT-SMITH
 Mechanics and Relativity. (First twenty lectures)
 DR J. RILEY
 Fields, Oscillations and Waves. (Last four lectures,
 beginning 23 Nov.)

Laboratory Work

PROF. R. HILLS AND OTHERS
 Experimental Physics. M. or Tu. or Th. or F. 2–6 Students
 attend one afternoon every fortnight.

DR G. A. C. JONES
 Fields, Oscillations and Waves. (First sixteen
 lectures)
 PROF. C. G. SMITH
 Statistical and Quantum Physics. (Last eight
 lectures, beginning 27 Feb.)

DR J. RILEY
 Fields, Oscillations and Waves. (First sixteen
 lectures)
 DR P. ALEXANDER
 Statistical and Quantum Physics. Last eight
 lectures, beginning 27 Feb.)

DR G. A. C. JONES AND OTHERS
 The same continued.

PROF. C. G. SMITH
 The same continued.

DR P. ALEXANDER
 The same continued.

DR C. J. B. FORD AND OTHERS
 The same continued.

Laboratory Work takes place at the *Cavendish Laboratory (West Cambridge)*. All students must attend an introductory talk for **Laboratory Work** at 11.30 a.m. on W. 5 Oct. at the *Cavendish Laboratory*. The Laboratory may be approached by the Madingley Road, or via the Coton cycle and footpath. For cyclists and pedestrians the latter is strongly recommended. **Laboratory work is continuously assessed.**

PHYSIOLOGY OF ORGANISMS

Course Organiser: Prof. A. C. Crawford (email: ac151@cam.ac.uk)
 Course Website: www.physiol.cam.ac.uk/PartIA/PhysiolOfOrg.html

All lectures take place in the *Physiology Main Lecture Theatre at Tu. Th. S. 12.*

DR C. J. SCHWIENING
 Cells in Water. (Three lectures, 6–11 Oct.)
 PROF. A. C. CRAWFORD
 Nerve, Synapse and Sense Organs. (Five lectures,
 13–22 Oct.)
 PROF. R. C. THOMAS
 The Structure and Function of Muscle. (Three lectures,
 25–29 Oct.)
 DR C. J. SCHWIENING
 Cardiac Physiology. (Three lectures, 1–5 Nov.)
 DR MICHAEL J. MASON
 Animal O₂ Acquisition and Respiration. (Three lectures,
 8–12 Nov.)
 DR S. O. SAGE
 Osmo- and Ionic Regulation in Animals. (Four lectures,
 15–22 Nov.)
 DR T. TIFFERT
 Animal Nutrient Acquisition. (Three lectures, 24–29
 Nov.)

Practical Work W. or F. 12–1 and 2–5

DR MATTHEW J. MASON
 Homeostasis. (Five lectures, 19–28 Jan.)
 DR J. M. HIBBERD
 Plant Physiology: an Introduction. (Four
 lectures, 31 Jan–7 Feb.)
 DR D. E. HANKE
 Plant Hormones. (Four lectures, 9–16 Feb.)
 PROF. H. GRIFFITHS
 Plant Adaptations and Interactions. (Five
 lectures, 18–28 Feb.)
 DR K. JOHNSTONE AND DR J. DAVIES
 Physiology of Plant – Microbe Interactions.
 (Six lectures, 2–14 Mar.)

The same continued.

DR D. J. TOLHURST
 Food Intake and Energy Balance. (Four
 lectures, 27 Apr. – 4 May)
 PROF. S. H. P. MADDRELL
 Integrative Animal Physiology. (Six lectures,
 6–18 May)
 DR C. J. SCHWIENING AND DR D. E. HANKE
 Comparing the Physiology of Plants and
 Animals. (Seminar, 20 May)

NATURAL SCIENCES TRIPOS, PART IA (continued) AND PART IB

MICHAELMAS 2005

LENT 2006

EASTER 2006

QUANTITATIVE BIOLOGY

Course Organiser: Prof. C. P. Ellington (email: c.ellington@zoo.cam.ac.uk)
 Course Website: www.quns.cam.ac.uk/qb/

Quantitative Biology is intended for those students who have studied Mathematics at GCE A-level or its equivalent. It does not provide a qualification for offering Mathematics in Part IB of the Natural Sciences Tripos.

New material comprising the course syllabus will be presented in the Tuesday and Thursday lectures. Additional worked examples, together with revision to aid the transition from GCE A-level, will be presented in the Saturday lectures. There will be no more than six Saturday lectures during the Michaelmas and Lent terms and three in the Easter term.

Lectures will be held in the Large Lecture Theatre, Department of Plant Sciences, Computer practicals and Examples classes in the Titan Teaching Room, New Museum Site, unless otherwise stated.

Lectures. Tu. Th. 9

A. N. OTHER

Introduction to the Growth and Decline of Populations.
 (Ten lectures, 6 Oct. – 8 Nov.)

PROF. C. P. ELLINGTON

Physiological Modelling. (Six lectures, 10–29 Nov.)

MR J. J. TRAPP

Introduction to Modelling of Interacting
 Populations. (Seven lectures, 19 Jan. –
 9 Feb.)

DR J. GOG

Interacting Populations: Ecological
 Applications. (Four lectures, 14–23 Feb.)

A. N. OTHER

Introduction to Statistical Methods. (Five
 lectures, 28 Feb. – 14 Mar.)

DR R. JOHNSTONE

Optimisation and Game Theory. (Four
 lectures, 27 Apr. – 9 May)

A. N. OTHER

Introduction to Statistical Methods. (Four
 lectures, 11–23 May)

Supplementary lectures. S. 9

These lectures are to aid the transition from A level, and to present worked examples from the syllabus.

Examples classes and Computer Practicals Th. 2–3.15, 3.30–4.45 or 4.45–6

A. N. OTHER, PROF. C. ELLINGTON AND DR R. JOHNSTONE

MR J. J. TRAPP, DR J. GOG, A. N. OTHER AND DR R. JOHNSTONE

DR R. JOHNSTONE

PART IB

ADVANCED PHYSICS

Course Organiser: Dr C. J. B. Ford (email: IB-advanced-physics@phy.cam.ac.uk)
 Course Website: www.phy.cam.ac.uk/teaching/

Lectures are given in the Cockcroft Lecture Theatre, New Museums Site, unless otherwise stated.

DR C. J. FORD

Electromagnetism. Tu. Th. S. 9 (Not last two S.)

Those not taking NST Part IB Mathematics:

PROF. S. WITHINGTON

Mathematics and Theoretical Physics. M. F. 11 Room B,
 Arts School, Bene't Street

Laboratory Work

DR R. D. E. SAUNDERS

Systems and Measurement.

DR J. ELLIS

Classical Dynamics. (First ten lectures)
 Tu. Th. S. 9

DR W. ALLISON

Statistical Physics. (Last nine lectures, beginning
 14 Feb.) Tu. Th. 9

Those taking NST Part IB Mathematics:

PROF. M. WARNER

Methods of Mathematical Physics. (Twelve
 lectures, beginning 6 Feb.) M. W. 9
 Room 1, Mill Lane Lecture Rooms

DR R. J. BUTCHER

Waves and Optics.

DR W. ALLISON

The same continued. (First seven lectures)
 Tu. Th. S. 9

Laboratory Work takes place at the *Cavendish Laboratory (West Cambridge)*. The experimental laboratories are open M. 2–6, Tu. 10–6, Th. 10–6 and F. 2–6. Students will be allocated periods within these times. All students must attend an introductory talk and register for **Laboratory Work** at 2.30 p.m. on W. 5 Oct. at the *Cavendish Laboratory*. **Laboratory work is continuously assessed.**