

TEACHERS **ON** TRACK

Professional Development at a World Class Research University



A free residential conference at the University of Durham
24 - 28 July 2005



Teachers on Track is a free residential conference at the University of Durham; a world class research university.

Our aim is to inform teachers across the science spectrum of the latest developments in the field and enable them to give their students the best possible guidance and support for university admissions.

SCIENCE AND THE UNIVERSITY OF DURHAM

Founded in 1832, the University of Durham, England's third oldest University, offers a unique blend of history and progress. Leading this innovation and development is the Faculty of Science, which currently teaches over 60 degree programmes, spanning 11 subject areas.

During this conference, teachers in the areas of Chemistry, Computer Science, Psychology, Mathematics, Engineering and Physics will receive

up to date subject advancement information, professional development and Higher Education admissions advice from some of the world's leading scientific departments.

All departments involved in Teachers on Track have been rated as International Centres of Scientific Research in the latest Research Assessment Exercise.

Professional Development

The University of Durham is building on the success of the Teachers on Track pilot conference and offering Science teachers the opportunity to attend a FREE residential conference, aimed at enhancing both Professional and Academic Development and encourage widening participation.

Taking place within the unique and historical City of Durham, this conference will offer delegates a chance to see innovation in action, find out about the latest developments in their subject area as well as receive updated advice and guidance about Higher Education.

Programme Content

Delegates are invited to attend sessions in two different subject areas, with each academic strand aimed at informing delegates on the latest developments within the subject, as well as offering a chance to refresh knowledge on the nature and content of Higher Education programmes in science.

All delegates are invited to attend the Professional Development Sessions, focussing on the way forward for progression from Science

A-Levels through to Undergraduate study, as well as providing a forum for delegates to discuss with University academics and admissions staff any issues relating to Higher Education progression.

Higher Education Guidance and Support

Advice for delegates on supporting students applying to Higher Education, and especially supporting students applying to science subjects and competitive institutions. The topics covered will include what makes a good personal statement, the ideal reference, HE opportunities, and Student Finances for 2006 and beyond.

Residential Arrangements

Based in Collingwood College at the University of Durham, this conference package includes four nights en-suite, full board accommodation and all social activities. Due to the generous support of The Sutton Trust, the University is able to offer this conference at no charge to delegates; however, it is unable to cover travel costs.

TEACHERS ON TRACK APPLICATION

Personal Information

NAME _____

DOB _____

ADDRESS (HOME) _____

TEL (HOME) _____

MOB _____

EMAIL _____

Education and Qualifications

1st DEGREE _____

AWARDING UNIVERSITY _____

2nd DEGREE _____

AWARDING UNIVERSITY _____

OTHER QUALIFICATIONS _____

School Information

SCHOOL NAME _____

SCHOOL ADDRESS _____

SUBJECT (main subject and any others taught) _____

AGE RANGE _____

OTHER RESPONSIBILITIES WITH SCHOOL (e.g. careers guidance) _____

Subject choice

Places will be allocated on a first come, first served basis. Please mark a first choice and second choice in each column with a '1' and a '2' in case your first preference subject is unavailable.

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> CHEMISTRY | <input type="checkbox"/> ENGINEERING |
| <input type="checkbox"/> COMPUTER SCIENCE | <input type="checkbox"/> MATHEMATICS |
| <input type="checkbox"/> EARTH SCIENCES | <input type="checkbox"/> PHYSICS |
| <input type="checkbox"/> PSYCHOLOGY | |

Please complete the attached application form and return in the pre-paid envelope enclosed to:

Teachers on Track, Undergraduate Admissions Office, University of Durham, University Office, Old Elvet, Durham DH1 3HP by Friday 22nd April 2005. Further information and downloadable copies of this brochure can be found at www.durham.ac.uk/admissions or by contacting Matthew Andrews, Head of Undergraduate Admissions on m.p.andrews@durham.ac.uk or 0191 334 6105.

TEACHERS ON TRACK

ACADEMIC SESSIONS

Chemistry

Session one

The "state of the art" in Chemistry research.

This session will contain three short lectures, focussing on current research topics in Chemistry at the interfaces with Biology, Materials and Physics. There will also be a tour of the 5* Research Facilities and updates on some of the newest advances in equipment, including NMR spectroscopy and Mass Spectrometry.

Session Two

From A-level to Degree - what students can expect.

This session will take an outline of A-level Chemistry specifications and follow through to 1st year Chemistry modules, and onwards to final year courses.

Themes through the subject will be traced, and the connections between A-level and degree will be explored. There will be a discussion of university chemistry admissions issues and an opportunity to see undergraduate teaching facilities.

Psychology

Session One

Psychology as an Undergraduate Student

An increasing number of the undergraduate intake in Psychology has an A2 Level in the subject. It is therefore important to tailor the introductory modules in the First Year to cater for a cohort with differing degrees of prior exposure to the discipline. The sessions will provide the opportunity to learn more about how Psychology teaching is delivered at University, through lectures in core topics and participation in practicals. Of central interest is how students can best prepare for the transition between school and University and how the Department of Psychology can design a curriculum to best suit their needs.'

Session Two

From Research to Curriculum:

Identifying how research can be applied to teaching

This session will take examples of current research in Psychology and identify how this can be linked to the A-Level Curriculum. Delegates will take part in practical sessions as well as a question and answer discussion on the future development of undergraduate psychology courses.

Engineering

Session One

Introduction to Engineering: Practical Approaches

This session will encompass an introduction to engineering from an undergraduate perspective as well as give delegates the opportunity to take part in practical sessions such as CAD drawing, electrical engineering, bridge construction and manufacturing.

Session Two

Research in the School of Engineering

This session will give delegates an opportunity to hear about current research in the school of engineering and take part in practical sessions such as a solar car project, robot projects, experiments featuring concrete beams and Simulink modelling of mechanical and electrical systems.

Mathematics

Session One

Symbolic Computation

Symbolic computer packages have allowed Mathematicians to study and analyse and prove previously unthinkable problems. This will be demonstrated via some case studies at undergraduate and school levels where students actively learn in the computing environment.

Session Two

From school to university: the flow of mathematical study

Case studies of the prerequisites of course material at a final year level will be traced back through the degree programme to A-level. Also, results from a recent pan-European study of students entering University to study Science will be summarised.

Earth Sciences

Session one

Geology for non-geologists

Delivered by a number of internationally recognised geologist's, in one of the top rated Earth Science departments, this session will highlight the importance of geology in our every day lives. A number of 'hands-on' practicals will provide an overview of modern Earth Sciences and how it crosses over with many other science disciplines. A field session to a local quarry will also take place to provide a complete picture on what it is like to study Earth Sciences at university.

Session Two

How the Earth Works

This session discusses the latest advances in the Earth Sciences, with a tour of the new purpose built department offering the state-of-the-art research facilities. There will be a chance to use some of the equipment and ideas suggested on how some the latest research results could be incorporated into the A-level and GCSE curriculum.

Physics

Session One

Astronomy and The Night Sky as an Educational Resource

A review of the night sky and a discussion of student projects using the naked eye and binoculars. Delegates will also experience the The Faulkes Telescopes, a national project providing schools with access to research quality telescopes for live robotic observing which allows students to experience practical astronomy related to the national curriculum. The session will discuss possible projects for students.

Session Two

Cool Things to do with Lasers

During the last fifteen years dramatic developments in the field of atom-light interactions have revolutionised atomic physics. It is now possible to produce the coldest gas in the universe through the process of laser cooling. Room temperature atoms (with typical speeds comparable to a jumbo jet, 300 m/s) can be cooled to micro Kelvin temperatures (typical speeds of mm/s). The fundamental physical processes underlying this exciting field of modern physics will be demonstrated in this lecture. This session will also be accompanied by an open session on A-levels and University Admissions where the various issues of A-level physics/maths and the bridge to university physics degree courses, admission processes at Durham, feedback to schools and colleges.

Computer Science

Session One

Computer Science in Schools.

Computer Science is a rapidly changing discipline and this rate of change and development can often pose a challenge to prospective applicants. This session will look at the great range of Computing/IT qualifications which students take and look at how these can feed into the courses on offer at high demand institutions and their impact on the admissions process. Following this session, there will be a question and answer session, where delegates will be able to take part in a discussion on admission to computer science.

Session Two

Application of Computer Science Research in Schools

This session will discuss the application of current research in Computer Science departments (in particular, Software Engineering and Theoretical Computer Science) and what impact this can have on curriculum delivery. Fundamental areas of computer science will also be looked at, which will include:

- Programming
- Mathematics and Reasoning
- Group Work
- Individual Projects.



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This document is available in a large text pdf format on request, telephone 0191 3346105.

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Programme of events

Sunday 24 July 2005

- 14.00 - 18.00 Arrive and register
- 18.00 - 18.30 Welcome and Drinks reception
- 18.30 - 20.30 Evening Meal

Monday 25 July 2005

- 9.00 - 13.00 Professional Development Seminar:
Science Learning Centre
Led by Dr Sally Preston, Director of the Science Learning Centre North East. This seminar will focus on a number of key issues in post-16 science education such as the importance of post-16 education, assessment for learning, planning a professional development programme for your department and life after Tomlinson - the implications of the government's response to the Tomlinson report.
- 13.00 - 14.30 Lunch
- 14.30 - 17.30 Academic sessions selected from:
 - Chemistry 1
 - Computer Science 1
 - Earth Sciences 1
 - Psychology 1
- 18.30 Prince Bishop River Cruise

Tuesday 26 July 2005

- 9.30 - 12.30 Academic sessions selected from:
 - Chemistry 2
 - Computer Science 2
 - Earth Sciences 2
 - Psychology 2
- 12.30 - 14.00 Lunch
- 14.00 - 17.00 Higher Education guidance and up-date
- 18.30 Ghost Walk of Durham City or Wine Tasting

Wednesday 27 July 2005

- 9.30 - 12.30 Academic sessions selected from:
 - Engineering 1
 - Mathematics 1
 - Physics 1
- 12.30 - 2.00 Lunch
- 14.00 - 17.00 Academic sessions selected from:
 - Engineering 2
 - Mathematics 2
 - Physics 2
- 18.00 - 18.30 Drinks reception
- 18.30 Formal Meal

Thursday 28 July 2005

- 10.00 Depart on Durham Campus Tour