



The Materials Science and  
Materials, Economics & Management  
Final Honours School Course Handbook 2014-15

This handbook is for students entering Final Honours School in 2014 and applies to both Part I and Part II



Department of Materials



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## Welcome

Welcome back to Oxford, and congratulations on passing your Prelims examinations! In the second year, you will be introduced to more advanced topics in Materials Science, but these are all firmly based on the work in the first year - so don't throw away your notes or forget all your thermodynamics! In addition, the more advanced courses in electrical and electronic properties go a great deal further than the physics component of the first year material.

The pattern of teaching will be very familiar. Lectures are the main way of offering you the content of the course, supported by tutorials as before. However, do not think that lecture handouts are all you need to do the tutorial sheets; using textbooks to read around the subject is much more important this year. The Practical Class continues to be a critical part of our teaching strategy, and some of the second year practicals are demanding and quite long - be prepared! Do not forget that practical marks contribute directly to one of the papers in Finals.

The Department takes a great deal of trouble to try and ensure that the coursework we ask you to study is both relevant and interesting. Please make full use of the lecture and practical questionnaires to feedback your thoughts on what we offer!

I hope that you have a very stimulating and energetic year.

A handwritten signature in black ink, appearing to read 'Chris Grovenor', with a long horizontal line extending from the end of the signature.

Professor Chris Grovenor  
Head of Department

## Important Dates and Deadlines

### Materials Science

#### SECOND YEAR

##### Michaelmas Term:

- **Week 1 Wednesday** deadline for registration with Language Centre for foreign language option.
- **Week 4 Friday** deadline for submission of application for the Supplementary Subject.

##### Hilary Term:

- **Week 9 (week following the end of) Monday Noon** deadline for submission of Business Plan (3 copies) to the Chair of Examiners in the Honour School of Materials Science, c/o Examination Schools, High Street, Oxford.

#### THIRD YEAR

##### Michaelmas Term:

- **Week 2 Tuesday Noon** Submission of Practical Books and complete set of Practical Reports to the Chair of Examiners in the Honour School of Materials Science, c/o Deputy Administrator (Academic).
- **Week 3 Tuesday Noon** absolute deadline for submission of Team Design Project report (3 copies) to the Chair of Examiners in the Honour School of Materials Science, c/o Deputy Administrator (Academic).
- **Week 3 Friday** Team Design Project presentations.

##### Hilary Term:

- **Week 1 Friday** submit your Part II Preference form to the Part II Project Organiser.
- **Week 2 Friday Noon** deadline for receiving entries for the Part I examination **College co-ordinated**.
- **Week 3 Tuesday Noon** absolute deadline for submission of Characterisation / Modelling Option report to the Chair of Examiners in the Honour School of Materials Science, c/o Deputy Administrator (Academic).
- **Week 3 Tuesday 2.00 p.m.** Part II Open Day.

##### Trinity Term:

- **Week 7 Monday** start of the Part I examination (provisional).

## FOURTH YEAR

### Michaelmas Term:

- **The Tuesday** (provisional) **following the first day of the Part II Michaelmas extended term**, which is the fifth Friday before Michaelmas full term, and is typically around September 8-15: Part II Induction Course.
- **Week 0 Friday** deadline for submission of completed Project Management Form 1 to Part II Project Organiser.
- **Week 4 Friday Noon** deadline for receiving entries for the Part II examination **College co-ordinated**.
- **Week 6 Friday** deadline for submission of Project Management Form 2 to the Part II Project Organiser.

### Hilary Term:

- **Week 6 Friday** deadline for submission of Project Management Form 3 to the Part II Project Organiser.

### Trinity Term:

- **Week 2** (provisional) Part II talks.
- **week 7 Wednesday Noon** submission of Part II thesis to the Chair of Examiners in the Honour School of Materials Science, Examination Schools, High Street, Oxford.

## Materials, Economics and Management

### SECOND YEAR

#### Hilary Term:

- **Week 7 Friday Noon** deadline for receiving entries for the Introductory Economics examination **College co-ordinated**.

#### Trinity Term:

- **Week 9** Introductory Economics Examination (Provisional).

### THIRD YEAR

#### Michaelmas Term:

- **Week 3 Tuesday Noon** absolute deadline for submission of Team Design Project report (3 copies) to the Chair of Examiners in the Honour School of Materials, Economics & Management, c/o Deputy Administrator (Academic).
- **Week 3 Friday** Team Design Project presentations.

#### Hilary Term:

- **Week 4 Friday Noon** deadline for receiving entries for the Part I examination **College co-ordinated**.

### **Trinity Term:**

- **Week 2 Tuesday Noon** Submission of Practical Books and complete set of Practical Reports to the Chair of Examiners in the Honour School of Materials, Economics & Management, c/o Deputy Administrator (Academic).
- **Week 7 Monday** start of the Part I examination (provisional).

## **FOURTH YEAR**

### **Hilary Term:**

- **Week 4 Friday Noon** deadline for receiving entries for the Part II examination **College co-ordinated**.
- **Week 0 Friday Noon** submission of Project report to the Chair of Examiners in the Honour School of Materials, Economics & Management, Examination Schools, High Street, Oxford.

### **Trinity Term:**

- **Week 7 Monday** start of the Part II examination (provisional).

## **How to use this handbook**

This handbook is intended as a guide and reference for you throughout the Final Honours School. The handbook read in conjunction with supplementary material such as the synopses of lecture courses for each year of your course, provides you with information to help you understand the processes and procedures of the Department and the other facilities such as libraries and computers to which you have access. Additionally, it will give you details of how you will be assessed and how your examination will be classified.

For those studying Materials Science, a further handbook will be issued to you at the start of your Part II which provides more detailed guidance about your research project. Those studying Materials, Economics and Management will receive further guidance from the Saïd Business School. Lecture synopses and course handbooks, together with supplementary information, are available on the Department website at [www.materials.ox.ac.uk](http://www.materials.ox.ac.uk). The synopses reflect the intended content of the corresponding lecture courses, although the lecturer may include material which enhances the syllabus but which does not form part of the syllabus for the examinations. You should note that, as part of the lecture synopses, supporting readings lists are issued.

The full lecture programme is captured in a document called the "General Scheme of Teaching". This describes how the programme fits together, setting out the structure, the contact hours and the terms in which each lecture course is delivered. The termly lecture lists provide the detail of the actual schedule. Used together, these provide you with a detailed outline of the entire programme.



The General Scheme of Teaching and each term's lecture list will be published online on the Department's website at: [www.materials.ox.ac.uk/teaching/lecturelists.html](http://www.materials.ox.ac.uk/teaching/lecturelists.html). Lecture lists are subject to change. Lecture lists are usually not published till 2-3 weeks before term starts.

Any changes to the published lecture lists will be communicated to you via email; this is our primary method of disseminating information and you must ensure that you check your email regularly (see section 15.3 for further details).

**YOUR COURSE HANDBOOK SHOULD BE YOUR FIRST PORT OF CALL FOR ANY MINOR QUERIES CONCERNING THE COURSE.** For other concerns or if you genuinely cannot find the correct information then your College tutor and the Academic Administration team are happy to help.

## Other sources of information

You should also receive:

- further information about your particular college's regulations and requirements,
- Essential Information for Students (Proctors' and Assessor's Memorandum) (also available electronically at [www.admin.ox.ac.uk/proctors/info/pam/index.shtml](http://www.admin.ox.ac.uk/proctors/info/pam/index.shtml).) This includes general information about health and welfare matters; the Student Union; accommodation; sport and recreation; transport; personal safety and security. It provides a source of information about the University's academic support services including the University Language Centre and Careers Services. The booklet also gives the University's formal, statutory rules and requirements in relation to Conduct of Examinations, Harassment, Freedom of Speech, etc.

Further details may be found via the student portal of the University intraweb ([www.ox.ac.uk/current\\_students/index.html](http://www.ox.ac.uk/current_students/index.html)).

The general and specific regulations describing the examination structure of the University and your course are published by the University in the Examination Regulations, sometimes called the "Grey Book", which is the authority on matters concerning University examinations and their conduct. A searchable electronic version of these can be found at: [www.admin.ox.ac.uk/examregs/Materials.shtml](http://www.admin.ox.ac.uk/examregs/Materials.shtml).

Amendments to the syllabus and course structure are carefully regulated by the University. If changes are made which affect you then you will be informed. In general your examination regulations will not be changed to your disadvantage once you have started studying for the examination concerned, providing that you take your examinations at the normal time.

## General

Comments or suggestions for matters which might be amended or which might usefully be covered in future editions of this handbook would be welcome. They should be sent to the Deputy Administrator (Academic) in the Department of Materials, or emailed to [philippa.moss@materials.ox.ac.uk](mailto:philippa.moss@materials.ox.ac.uk).

If you require this handbook in a different format, please contact the Deputy Administrator (Academic): [philippa.moss@materials.ox.ac.uk](mailto:philippa.moss@materials.ox.ac.uk) or 73750.

## Useful Websites

Oxford University information for students

[www.ox.ac.uk/students/](http://www.ox.ac.uk/students/)

Materials Department website

[www.materials.ox.ac.uk](http://www.materials.ox.ac.uk)

Undergraduate teaching page

[www.materials.ox.ac.uk/teaching.html](http://www.materials.ox.ac.uk/teaching.html)

Weblearn

<https://weblearn.ox.ac.uk>

Department of Economics

[www.economics.ox.ac.uk](http://www.economics.ox.ac.uk)

Saïd Business School

[www.sbs.ox.ac.uk](http://www.sbs.ox.ac.uk)

MEM teaching Management

<https://weblearn.ox.ac.uk/portal/hierarchy/socsci/sbs/undergrads>

MEM Teaching Economics

[https://weblearn.ox.ac.uk/portal/hierarchy/socsci/econ/curr\\_student](https://weblearn.ox.ac.uk/portal/hierarchy/socsci/econ/curr_student)

Oxford Exam Papers Online

<https://weblearn.ox.ac.uk/portal/hierarchy/oxam>

Electronic resources available through the University libraries

[www.bodleian.ox.ac.uk/eresources](http://www.bodleian.ox.ac.uk/eresources)

Radcliffe Science Library

[www.bodleian.ox.ac.uk/rsl](http://www.bodleian.ox.ac.uk/rsl)

Careers Service

[www.careers.ox.ac.uk](http://www.careers.ox.ac.uk)

Language Centre

[www.lang.ox.ac.uk](http://www.lang.ox.ac.uk)

Institute of Materials, Minerals and Mining

[www.iom3.org](http://www.iom3.org)

Oxford Materials Society

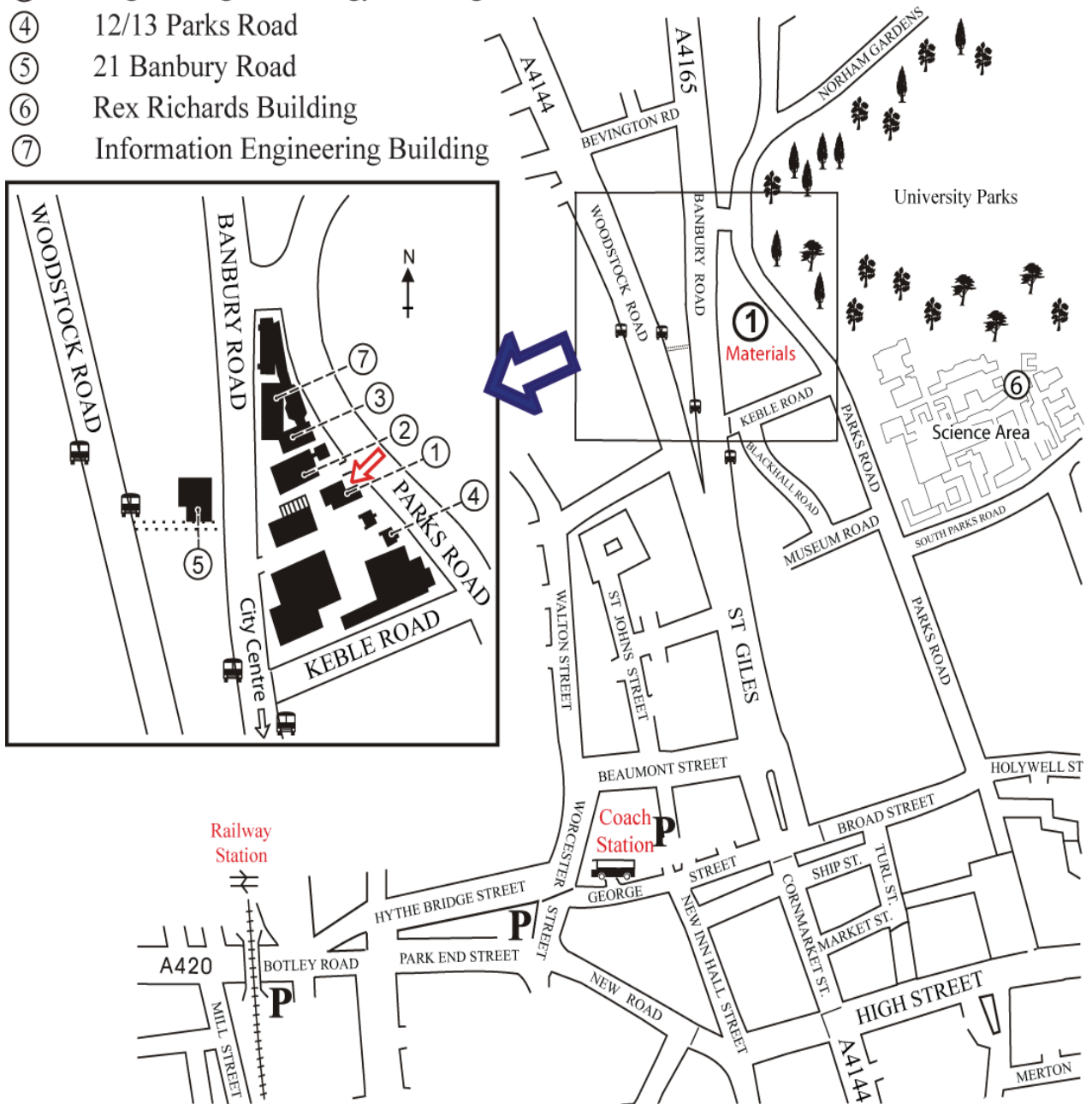
[www.oxfordmatsoc.com](http://www.oxfordmatsoc.com)

Materials Society (Undergraduate)

[www.matsoc.com](http://www.matsoc.com)

# Department of Materials - Map of Central Site

- ➔ Reception
- ① Hume-Rothery Building
- ② Holder Building
- ③ Engineering Technology Building
- ④ 12/13 Parks Road
- ⑤ 21 Banbury Road
- ⑥ Rex Richards Building
- ⑦ Information Engineering Building



# **1 Where to find places in the Department**

The map of the Science Area shows the location of various buildings of interest to Materials undergraduates. The location of some places of note within the various buildings is listed below.

Entry to the Hume-Rothery Building, 21 Banbury Road and 12/13 Parks Road is controlled by means of a swipe card access system. All people wishing to enter these buildings must carry their University card and use this to swipe themselves in. All undergraduates should have been entered automatically into the system; this will give you entry between 8 am – 6 pm, Monday - Friday. If you have any problems with your swipe card, please see the General Office.

## **1.1 Hume-Rothery Building (HR)**

The Lecture Theatre is on the ground floor.

The General Office and the Reception Area are on the ground floor.

The Director of Studies' office is room 30.19 on the second floor.

The Deputy Administrator (Academic)'s office is room 30.05 on the second floor.

The Assistant to Deputy Administrator (Academic)'s office is room 30.07 on the second floor.

The Deputy Administrator (Finance) and the Finance Officer are located on the ground floor in the General Office.

The Departmental Library is in room 20.19 on the first floor.

The main photocopier is in the document room in the General Office on the ground floor.

The Head of Department's office is room 30.16 on the second floor.

The Administrator's office is room 30.14 on the second floor.

The Administrative Secretary's office is room 30.13 on the second floor.

Stores are in room 10.17 on the ground floor.

The Main Workshops and the Students' Workshop are in the basement.

## **1.2 Holder Building (HB)**

The Teaching Laboratory and the Computer Room (room 316) are on level 3.

The Common Room, which is a shared facility with the Department of Engineering Science, is on level 2. Undergraduates are welcome to use the Common Room, where you can buy coffee, tea, lunches and snacks.

The Electron Microscope Suite is on level 1.

## **1.3 Engineering and Technology Building (ETB)**

The ETB is also known as the Wolfson Building.

The Wolfson Meeting Room is room 20.30.

## **1.4 21 Banbury Road (BR)**

The Lecture Room is room 00.19 on the ground floor.

The Conference Room is room 10.04 on the first floor.

## **1.5 12/13 Parks Road (PR) – QIP-IRC Building**

The Meeting Room is on the first floor.

## **1.6 Thom Building (Department of Engineering Science)**

Lecture Rooms 1, 2 and 3 are on level 1.

Lecture Rooms 4, 5 and 6 are on level 8.

## **1.7 Information Engineering Building (Department of Engineering Science)**

The IEB is most easily accessed through the ETB Building.

Lecture Room 7 is on the ground floor.

Lecture Room 8 is on the ground floor.

# **2 Staff of the Department of Materials**

## **2.1 Professors**

Professor Simon Benjamin, Professor of Materials, Senior Fellow in Quantum Materials, Fellow of Wolfson College

Professor Andrew Briggs, Professor of Nanomaterials, Director of Quantum Information Processing Interdisciplinary Research Collaboration, Professorial Fellow of St Anne's College

Professor Peter Bruce, Wolfson Chair in Metallurgy, FRS, Professorial Fellow of St Edmund Hall

Professor Sir Richard Brook OBE, FREng, on leave of absence as Director of the Leverhulme Trust, Honorary Fellow of St Cross College

Professor Martin Castell, Professor of Materials, Fellow of Linacre College

Professor Ralf Drautz, Visiting Professor of Materials

Professor Colin English, Visiting Professor of Materials

Professor Feliciano Giustino, Professor of Materials, Fellow of Wolfson College

Professor Patrick Grant FREng FIMMM, Vesuvius Professor of Materials, Director of Faraday Partnership in Automotive and Aerospace Materials, Fellow of St Catherine's College

Professor Nicole Grobert, Professor of Materials, Fellow of Corpus Christi College

Professor Chris Grovenor, Head of Department, Fellow of St Anne's College

Professor Sir Peter Hirsch FRS, Emeritus Professor, Emeritus Fellow of St Edmund Hall

Professor Angus Kirkland, Professor of Materials, Fellow of Linacre College

Professor James Marrow, James Martin Chair in Energy Materials, Fellow of Mansfield College

Professor Peter Nellist, Professor of Materials, Fellow and Tutor of Corpus Christi College

Professor John Pethica FRS, Visiting Professor of Materials, Fellow of St Cross College

Professor David Pettifor CBE FRS, Emeritus Professor, Emeritus Fellow of St Edmund Hall  
Professor Roger Reed, Professorial Research Fellow in Materials and Solid Mechanics, Fellow of  
St Anne's College

Professor Steve Roberts, Professor of Materials, Fellow of St Edmund Hall

Professor George Smith FRS, Emeritus Professor, Emeritus Fellow of Trinity College

Professor John Sykes, Emeritus Professor, Emeritus Fellow of Mansfield College

Professor Richard Todd, Professor of Materials, Goldsmiths Fellow and Tutor of St Catherine's  
College

Professor Jamie Warner, Professor of Materials, Fellow of Balliol College

Professor Michael Whelan FRS, Emeritus Professor, Emeritus Fellow of Linacre College

Professor Angus Wilkinson, Professor of Materials, Fellow of St Cross College

Professor Peter Wilshaw, Professor of Materials, Fellow and Tutor of St Anne's College

### **1.1 Associate Professors and Lecturers**

Professor Hazel Assender, Fellow of Linacre College

Professor Harish Bhaskaran, Research Lecturer in Materials

Professor Jan Czernuszka, Harassment Advisor, Fellow and Tutor of Trinity College

Professor Marina Galano, Maths Class Coordinator, Fellow and Tutor of Mansfield College

Professor Sergio Lozano-Perez, George Kelley Associate Professor of Materials

Professor Michael Moody, Fellow and Tutor of Trinity College

Professor Keyna O'Reilly, Fellow and Tutor of The Queen's College, MEM Coordinator, Part II  
Project Organiser, Practical Class Organiser

Professor Jason Smith, Fellow and Tutor of Mansfield College

Professor Andrew Watt, Academic Fellow, Safety Officer, Fellow of St Cross College

Professor Jonathan Yates, Chair of Tutors' Committee, Fellow and Tutor of St Edmund Hall,  
Associate Professor in Materials Modelling

### **1.2 Senior Research Fellows and others involved in teaching**

Dr Chris Allen, Research Fellow

Dr David Armstrong, RAE Research Fellow

Dr Paul Bagot, Departmental Lecturer

Dr Jenny Barnes, Academic Visitor

Dr Konstantin Borisenko, Senior Research Fellow

Dr Flynn Castles

Dr David Collins, Research Fellow

Dr Steven Fitzgerald, Departmental Lecturer in Materials Modelling

Dr Barbara Gabrys, Academic Visitor

Dr Mike Jenkins, Fellow and Tutor of Trinity College

Dr Lewys Jones, Industrial Visits Academic Organiser

Dr John Mason, Research Fellow  
Dr Rebecca Nicholls, EPSRC Fellow in Materials for Energy Applications  
Dr Christiane Nörenberg, Academic Visitor  
Dr Kyriakos Porfyrakis, St Anne's College Research Fellow  
Dr Susie Speller, RAE Research Fellow  
Dr Ed Tarleton, Research Fellow  
Dr Mark Telling, Academic Visitor  
Professor John Titchmarsh, Senior Visiting Research Fellow  
Dr Aurelien Trichet  
Dr Stuart Wilkinson, Business Plan Tutor  
Dr Neil Young, Senior EM Research Scientist

### **1.3 Support staff**

Mr Chris Akinola, IT Officer  
Mrs Marion Beckett, PA to the Director of Studies and Graduate Studies Secretary  
Mrs Rebecca Bradford, Finance and Administrative Assistant  
Mrs Alana Davies, Administrator  
Mr Barry Fellows, Finance Officer  
Miss Jane Foxall, Reception / Finance Assistant  
Mrs Alison Jewitt, Administrator's Secretary  
Ms Lorraine Laird, Secretary to the Head of Department  
Mr Tim McAree, Deputy Administrator (Finance)  
Ms Philippa Moss, Deputy Administrator (Academic), Disability Contact  
Miss Emma Purves, Assistant to Deputy Administrator (Academic)  
Dr Jo Roberts, Deputy Administrator (Research & Finance)  
Mr Rob Saunders, IT Officer  
Dr Mimi Nguyen, Teaching Class and Chemical Safety Technician  
Mrs Grace Sewell, Librarian  
Mrs Jayne Shaw, Schools Liaison Officer  
Dr Adrian Taylor, Director of Studies, Chairman of Faculty, Chairman of Teaching Committee,  
Team Design Project Organiser, Summer Placements Advisor, Admissions Coordinator  
Mrs Paula Topping, Teaching Laboratory Technician, Harassment Advisor  
Ms Debbie Townsend, Finance and Administrative Assistant  
Mr Laurie Walton, Workshop Supervisor, Students' Workshop Technician, Harassment Advisor  
Dr Paul Warren, Senior IT Officer



## 2.2 Where to find members of staff

Table 1 lists the locations, telephone numbers and email addresses of members of staff. Note that all email addresses end with @materials.ox.ac.uk. The full names and locations of buildings can be found in Section 1. You can find telephone numbers and email addresses of members of the University on the www at the URL: [www.ox.ac.uk/contact](http://www.ox.ac.uk/contact). Also, [www.materials.ox.ac.uk/infoandnews/peoplecontact.html](http://www.materials.ox.ac.uk/infoandnews/peoplecontact.html) gives access to the full business card details.

**Table 1: Offices, telephone numbers and email addresses of staff members.**

<b>Name</b>	<b>Building</b>	<b>Room</b>	<b>Phone</b>	<b>First part of email</b>
Prof. H.E. Assender	BR	10.18	73781	hazel.assender
Dr P.A.J. Bagot	HR	30.15	73699	paul.bagot
Prof. S.C. Benjamin	PR	40.02	73732	simon.benjamin
Prof. G.A.D. Briggs	PR	30.05	73725	andrew.briggs
Mrs R. Bradford	HR	10.12	73777	rebecca.bradford
Prof. M.R. Castell	ETB	40.24	73786	martin.castell
Prof. J.T. Czernuszka	BR	10.15	73771	jan.czernuszka
Mrs A.P. Davies	HR	30.14	73747	alana.davies
Dr S.P. Fitzgerald	BR	20.09	83218	steve.fitzgerald
Prof. M.L. Galano	BR	20.07	73776	marina.galano
Prof. F. Giustino	RR	40.27	12790	feliciano.giustino
Prof. P.S. Grant	ETB	40.22	83324/83703	patrick.grant
Prof. N. Grobert	HB	30.13	73762	nicole.grobert
Prof. C.R.M. Grovenor	HR	30.17	73761	chris.grovenor
Dr D.V. Isakov	BB	10.02	83707	dmitry.isakov
Mrs A. Jewitt	HR	30.13	73666	alison.jewitt
Prof. A.I. Kirkland	HB	30.07	73662	angus.kirkland
Ms L.I. Laird	HR	30.17	73737	lorraine.laird
Prof. S. Lozano-Perez	HB	30.23	73707	sergio.lozano-perez
Prof. T.J. Marrow	BR	10.12	73938	james.marrow
Prof. M.P. Moody	HR	30.21	73693	michael.moody
Ms P. Moss	HR	30.05	73750	philippa.moss
Prof. P.D. Nellist	HB	30.04	73656	peter.nellist
Dr C. Nörenberg	BR	10.20	83782	christiane.norenberg
Prof. K.A.Q. O'Reilly	BR	10.02	73743	keyna.oreilly
Miss E.K. Purves	HR	30.07	73703	emma.purves
Prof. S.G. Roberts	BR	10.16	73775	steve.roberts
Mrs G. Sewell	HR	20.19	73697	library / grace.sewell
Prof. J.M. Smith	PR	30.10	73780	jason.smith

<b>Name</b>	<b>Building</b>	<b>Room</b>	<b>Phone</b>	<b>First part of email</b>
Dr A.O. Taylor	HR	30.19	83227	adrian.taylor
Prof. R.I. Todd	ETB	40.23	73718	richard.todd
Mrs P. Topping	HB	30.20	73658	paula.topping
Ms D. Townsend	HR	10.12	73680	debbie.townsend
Mr L. Walton	HR	Lab	73687/73749	laurie.walton
Prof. J.H. Warner	PR	20.03	73790	jamie.warner
Dr P.J. Warren	HR	30.06	73727	paul.warren
Prof. A.A.R. Watt	PR	20.03	73790	andrew.watt
Prof. A.J. Wilkinson	BR	20.04	73792	angus.wilkinson
Prof. P.R. Wilshaw	ETB	50.15	73736	peter.wilshaw
Prof. J.R. Yates	RR	40.17	12797	jonathan.yates

### **3 General Safety and Security**

#### **3.1 Fire**

You should familiarise yourself with the general procedures involved if a fire breaks out. These are described below.

##### **If a fire breaks out:**

The main consideration is to get everyone out safely.

Sound the fire alarm (break glass alarm points are situated at all exits) and dial 999 from any phone.

Follow the evacuation procedure:

Familiarise yourself with escape routes.

- **Do Not** wedge open or obstruct fire doors.
- **Do Not** use lifts.

If there is time, close windows and doors, and switch off electrical appliances.

Go to the assembly point.

#### **3.2 Security**

Please do not leave personal belongings around. Thefts do occur with depressing regularity! You must use your university card to gain access to the Hume-Rothery Building (outside the General Reception area only), 21 Banbury Road and 12/13 Parks Road. If you leave a Departmental building, please ensure that the door closes securely after you.

### 3.3 University Policy Statements

For further information on University Policy Statements and full statements of Safety Organisation, please visit the University Web Site at: [www.admin.ox.ac.uk/safety/](http://www.admin.ox.ac.uk/safety/)

Further information on safety in the Teaching Laboratory is found in Section 10.1.

## 4 Who to ask for information about the course

If you have any queries about the running and scheduling of your course, i.e. deadlines for coursework, timetable issues, the titles of coursework, when the exams are going to start, etc. then you should consult the Deputy Administrator (Academic) as your first port of call. If she cannot help, she will refer your question to the appropriate member of staff.

Exceptions are:

- a) matters concerning voluntary industrial placements, the industrial tour and team design projects, for which your first port of call should be the Director of Studies, and
- b) matters concerning Part II projects, which are looked after by the Part II Project Organiser, assisted by the Deputy Administrator (Academic).

Table 2 lists the staff members, both academic and non-academic, who are involved with the administration of the course. Please note though, if you have worries about your academic work (for example, maybe you feel overwhelmed or confused about certain topics) **then you should obviously consult your College Tutor first.**

**Table 2: Administration of the course**

Dr Adrian Taylor	Director of Studies & Chair of the Academic Committee, Chair of the Faculty of Materials
Ms Philippa Moss	Deputy Administrator (Academic), Disability Contact
Miss Emma Purves	Assistant to the Deputy Administrator (Academic)
Prof. Keyna O'Reilly	MEM Coordinator, Part II Project Organiser, Practical Class Organiser
Dr Lewys Jones	Industrial Visits Organiser
Prof. Marina Galano	Maths Class Coordinator
Prof. Jonathan Yates	Chair of the Tutors' Committee
Mrs Paula Topping	Practical Class Technician
Mrs Marion Beckett	PA to the Director of Studies, Graduate Studies Secretary
Mrs Rebecca Bradford	General Office
Ms Debbie Townsend	General Office
Miss Jane Foxall	General Office
Prof. Andrew Watt	Departmental Safety Officer, Chair of the Safety Committee
Dr Dmitry Isakov	Crystallography Class Organiser

## 5 The Joint Consultative Committee for Undergraduates (JCCU)

The JCCU constitution states:

'The committee shall consider and make recommendations upon teaching arrangements, lectures, seminars, the practical course, syllabuses, examinations, libraries and welfare of junior members'.

In other words, the JCCU provides a direct opportunity for you to constructively criticise, praise and complain about the course, and also to suggest improvements. Information about the JCCU and previous minutes can be found at: [www.materials.ox.ac.uk/teaching/jccu.html](http://www.materials.ox.ac.uk/teaching/jccu.html).

The Committee consists of normally three students from each year group, as well as members of academic staff. We meet once a term over a light lunch. The Chair is always an undergraduate (currently Adrian Matthew), and the Secretary is currently the Deputy Administrator (Academic), who is also an ex officio member of the Committee. Other ex officio members of the Committee are the Director of Studies, Dr Adrian Taylor, the Practical Class Organiser and Part II Organiser, Professor Keyna O'Reilly, and the Industrial Visits Organiser, Dr Lewys Jones. In addition, one member of academic staff from the Faculty of Materials is an elected member.

Probably the most obvious indication to undergraduates of the JCCU's existence is the lecture feedback questionnaires that are considered by the Committee each term. This year, we are trialling the use of electronic questionnaires and the online surveys will be available following the penultimate lecture of each course. The questionnaires are analysed and summarized by the Deputy Administrator (Academic). Positive comments are encouraged as well as negative ones. Please do take the time to complete these. All comments are carefully considered by the Academic Committee and both major and minor changes are continually made to courses in the light of student feedback. In addition, a summary of the completed questionnaires is available to the Head of Department, for use in lecturers' annual appraisals, and cases for promotion and references. If you have any issues regarding the course, from lectures, to practicals, to maths classes, you should raise these with your year representative who in turn will raise them at the following JCCU meeting.

Another role of the JCCU is to arrange social functions (such as the annual drinks party) and overseas industrial tours (usually annually). Recent successes were the industrial tours to: the Netherlands Easter 2010, California Easter 2011, Milan Easter 2012, Beijing Easter 2013 and Krakow in Poland Easter 2014. The Worshipful Company of Armourers and Brasiers, The Worshipful Company of Ironmongers, The IOM3 and industrial sponsors supported these trips.

The Mathematics, Physical and Life Sciences (MPLS) Division has a similar forum, the Undergraduate Joint Consultative Forum (UJCF), with a broader agenda, on which the Department of Materials has student representation. Further information may be found at [www.mpls.ox.ac.uk/learning/student-representation-mpls](http://www.mpls.ox.ac.uk/learning/student-representation-mpls).

## 6 Overview of the Courses

### 6.1 General Structure of the Materials Science and Materials, Economics and Management Courses

The overall structure of the MS and MEM courses is shown in Table 3. More details of the courses taken each year and the options available are discussed in the following sections.

Lectures are an important part of the teaching in science subjects, and whilst attendance at lectures is not compulsory in Oxford, we strongly advise you to attend them. In many cases the material that is taught in lectures is not available in books. Tutorials are likely to be based on the lectures so attendance at lectures ensures you will get the most from your tutorials. Lecturers are free to give out lecture handouts for their courses and many do. **However, there is no Departmental policy on this practice and it is up to the lecturers' discretion as to whether they provide notes or not, and as to how detailed those notes may be.**

You are reminded that the use of electronic media (e.g. smart phones) to record material from lectures (visual and audible) is not permitted unless express permission is granted. This includes taking photos of projected slides, not least because of copyright law (the copyright is owned by the lecturer!).

**Table 3: Outline of MS & MEM Programme & Assessment Structure as at October 2014**

Year	Materials Science (MS)			Materials, Economics and Management		
1	<b>Common First year:</b>					
	<b>Directly examined</b>		<b>Continually assessed</b>		<b>Additional elements</b>	
	Structure of Materials (40) Properties of Materials (34) Transforming Materials (37) Maths for Materials (42)		Practical work (128) Crystallography classes (36)		IT skills Industrial visits Career Planning (1) Foreign Language 1a option (80) Engineering Drawing classes (6) Introduction to Errors in Measurement (2)	
<b>Preliminary Examinations</b>						Resit Available in September
2	<b>Directly examined</b>	<b>Continually assessed</b>	<b>Additional elements</b>	<b>Directly examined</b>	<b>Continually assessed</b>	<b>Additional elements</b>
	Structure & Transformation of Materials (40) Electronic Properties of Materials (42) Mechanical Properties (42) Engineering Applications of Materials (40) <b>Foreign language 1b option (64)</b> <b>Supplementary subject option (32)</b>	Practical work (198) Industrial Visits (11) <b>Entrepreneurship &amp; New Ventures (34)</b>	Industrial Talks (5) Mathematics (8) Communication Skills	Structure & Transformation of Materials (40) Electronic Properties of Materials (42) Mechanical Properties (42) Engineering Applications of Materials (40) <b>Introductory Economics (32)</b>	Practical work (83) Industrial Visits (11)	Industrial Talks (5) Mathematics (8) Communication Skills
3	<b>Materials Options 1 (36 + 9 classes)</b> Materials Options 2 (36 + 9 classes)			Team design project (100) <b>Characterisation / Modelling module (100)</b> Industrial visits (11)		
				<b>Introductory Economics Finals Examination (Part I) : Marks held until year 3</b>		
3	<b>Materials Options 1 (36 + 9 classes)</b> Materials Options 2 (36 + 9 classes)			<b>Microeconomics (22+4)</b> <b>General Management (32)</b>		Team design project (75) Industrial visits (11) Practical work (66)
	<b>Finals Examinations, Part I</b>					
Pass with Honours – unclassified BA (Hons) [≥50% required for progression onto Part II]		Pass without Honours or Pass with Honours <50% - unclassified BA (pass or Hons as appropriate [no progression onto Part II or resit following year]			Fail –resit following year	
4	<b>8-month Research Project</b>		<b>Project Mgt Skills</b> <b>Information Skills</b> <u>Optional Skills Training:</u> <b>Reference Management</b> <b>Technology Transfer</b> <b>Workshop Skills</b> <b>Presentation Skills</b> <b>Writing Skills &amp; IPR</b> <b>Foreign Language 2</b> <b>LabVIEW</b> Industrial Visits Careers Lecture Careers & Networking event with Alumni		Materials Options 2 (36 + 9 classes) <b>Economics / Management Options (32)</b> 24-week management project and placement + associated skills workshops	
	<b>Finals Examinations, Part II</b>					
Pass with Honours - Classified M.Eng		Pass without Honours - unclassified BA (Honours)			Fail - Unclassified BA (Honours)	

Bold indicates course elements that are NOT shared between MS & MEM.

Approximate contact hours are given in brackets

## 6.2 The Second Year

In the second year, MS and MEM students study core courses, which are divided into four main subject areas, which are examined by the four General Papers of the Part I Examination: Structure and Transformation of Materials, Electronic Properties of Materials, Mechanical Properties, and Engineering Applications of Materials. Practical work in the form of set practicals continues in the second year (see Section 10). MEM students study the same core courses, but some parts of the practical course are done in the third year, as MEM students have courses in Economics and Management from their second year onwards. Further details about the MEM courses are available at [https://weblearn.ox.ac.uk/portal/hierarchy/socsci/econ/curr\\_student](https://weblearn.ox.ac.uk/portal/hierarchy/socsci/econ/curr_student), for Economics, and <https://weblearn.ox.ac.uk/portal/hierarchy/socsci/sbs/undergrads>, for Management.

Table 4 below provides the outline syllabus for the 2<sup>nd</sup> year, listing the courses taken in each subject area. More detail can be found in the FHS Core Lecture Course Synopses booklet available at [www.materials.ox.ac.uk/teaching/ug/uglectures.html](http://www.materials.ox.ac.uk/teaching/ug/uglectures.html). In addition, MEM students study and are examined in Introductory Economics in their second year, more details of this course can be found on [www.economics.ox.ac.uk](http://www.economics.ox.ac.uk).

**Table 4: The Second Year Courses and General Lectures**

<b>Subject</b>	<b>Hours per course</b>
<b>Structure &amp; Transformation of Materials</b>	
Surfaces & Interfaces	4
Phase Transformations & Diffusion	16
Corrosion & Protection	8
Ternary Phase Diagrams	4
Microstructures of Polymers	4
Powder Processing	4
<b>Electronic Properties of Materials</b>	
Tensor Properties of Materials	4
Quantum & Statistical Mechanics	12
Electronic Structure of Materials	8
Semiconductor Materials	6
Electrical, Optical, & Magnetic Properties	12
<b>Mechanical Properties</b>	
Elastic Behaviour in Isotropic Materials	4

<b>Subject</b>	<b>Hours per course</b>
Microplasticity	10
Creep	4
Macroplasticity & Mechanical Working Processes	8
Fracture	8
Mechanical Properties of Polymers	4
Mechanical Properties of Composites	4
<b>Engineering Applications of Materials</b>	
Microstructural Characterisation of Materials	8
Semiconductor Devices	6
Engineering Alloys	14
Ceramics & Glasses	8
Engineering Applications of Polymers	4
<b>Supplementary Subjects (optional)</b>	
History & Philosophy of Science: The Origins of Science	16
Quantum Chemistry	32
<b>Other Lectures</b>	
Introduction to the Pt I Materials Programme	1
Maths - Partial Differential Equations & Fourier Series	8
Introduction to Economics (Ec1 MEM students only)	32
Engineering & Society: Building a Business	8
Building a Business Tutorials	6
Communicating through public presentations	1
Introduction to Industrial Visits	1
Industrial Talks	4
Year 2 Summer Business Placements Briefing	2
Industrial Placements Briefing	1
Practical class meetings	3

MS students only are required to produce **Engineering and Society** coursework (see Section 7.3), comprising one piece of work for which lectures are provided (Building a Business Tutorials). MS and MEM students must also submit reports on four Industrial visits undertaken during their second and third years. Details are given in Section 7.1.



MS students may take an optional Supplementary Subject in their second year (see Section 9), or they may take a foreign language option (see Section 8).

### 6.3 The Third Year

The third year Materials lectures are offered as option courses with lectures taking place in Michaelmas and Hilary terms. MS students normally choose 3 courses each term from the courses listed below in Table 5. Each 12 hour lecture course is accompanied by 3 classes (of 1-2 hours in length).

Please note that MEM students study the Options in the Hilary term of their 4<sup>th</sup> year (Part II). Each term is examined in a separate Materials Options examination paper.

Details of each course can be found in the FHS Materials Options Lecture Course Synopses document at [www.materials.ox.ac.uk/teaching/ug/uglectures.html](http://www.materials.ox.ac.uk/teaching/ug/uglectures.html).

**Table 5: Option Courses Available**

Lecture Course	Term	Lectures
Prediction of Materials' Properties	M	12
Engineering Ceramics: Synthesis & Properties	M	12
Strength & Failure of Metals & Alloys	M	12
Materials and Devices for Optics & Optoelectronics	M	12
Nanomaterials	M	12
Devices	H	12
Advanced Engineering Alloys & Composites: Design & Applications	H	12
Advanced Manufacture with Metals & Alloys: Processing, Joining & Shaping	H	12
Biomaterials and Natural Materials	H	12
Advanced Polymers	H	12
Materials for Energy Production, Distribution & Storage	H	12

Further information regarding the structure of the options courses is provided at the front of the options synopses document.

In addition, MS students carry out a Team Design Project in the first two weeks of Michaelmas Term and one of two options modules, Advanced Characterisation or Materials Modelling, in the first two weeks of Hilary Term.

Third year MEM students do not attend the Materials options lectures or the Characterisation / Modelling options modules, instead they study General Management (M1) and Microeconomics

([www.economics.ox.ac.uk/index.php/undergraduate/details/finals\\_microeconomics/](http://www.economics.ox.ac.uk/index.php/undergraduate/details/finals_microeconomics/)). MEM students do carry out the Team Design Project and the workload across the 3 departments at this time has been carefully agreed – see Section 13.2 for further details.

## 6.4 The Fourth Year

The fourth year of MS consists of an 8-month research project, examined by a thesis and viva. MEM students undertake a 24-week management project in the summer after their third year and extending into Michaelmas Term of their fourth year. In Hilary and Trinity Terms of their fourth year, they return to the Department for further lectures and tutorials, comprising the Materials options courses taught in Hilary Term, and Economics / Management options. These are followed by two examination papers.

## 6.5 The lecture timetable

The timetable of lectures each term and the general scheme of lectures for the whole year are available at [www.materials.ox.ac.uk/teaching](http://www.materials.ox.ac.uk/teaching). Changes are notified to students by e-mail and on the website.

## 7 Coursework

As mentioned in the sections above, MS and MEM students continue with coursework during their 2<sup>nd</sup> and 3<sup>rd</sup> years. Coursework items are listed in Table 6 below. Further details on coursework can be found below or in Section 10 for Practical work.

**Table 6: FHS Coursework for MEM and MS students**

Coursework item	Year and term studied	Notes
Materials Practical Classes ( <b>MS</b> )	2 <sup>nd</sup> year (M, H, T)	See Section 10
Materials Practical Classes ( <b>MEM</b> )	2 <sup>nd</sup> and 3 <sup>rd</sup> year (M, H, T)	See Section 10
Industrial Visit Reports	2 <sup>nd</sup> and 3 <sup>rd</sup> years	
Engineering and Society ( <b>MS only</b> )	2 <sup>nd</sup> year (M, H)	
Team Design Project	3 <sup>rd</sup> year (M)	
Materials Characterisation / Materials Modelling Options ( <b>MS only</b> )	3 <sup>rd</sup> year (H)	Either Characterisation or Modelling is chosen.

Regulations state that the Examiners shall require evidence of satisfactory completion of each element of coursework in Materials. ‘Satisfactory completion’ is defined as: normally all reports expected for an element of coursework must be submitted and an overall mark of at least 40% must be achieved for that element of coursework. Further details are given in later sections.

## 7.1 Industrial Visits

One industrial visit to an industrial company or research laboratory related to the materials field is arranged each term by the Industrial Visits Organiser (often, but not exclusively, on Thursday or Friday afternoon of week 4, 5 or 6). The Industrial Visits Organiser for 2014-15 is Dr Lewys Jones (email [lewys.jones@materials.ox.ac.uk](mailto:lewys.jones@materials.ox.ac.uk)).

As part of your coursework as a Part I student, you are **required** to attend 4 visits during “**the 5 terms subsequent to the sitting of the First Public examination**” (Examination Regulations 2014). This translates as: the **Michaelmas, Hilary, and Trinity Terms of your second year** and the **Michaelmas and Hilary Terms of your 3<sup>rd</sup> year**. Third year students **will not** be offered places on the Trinity Term industrial visit of their third year.

Industrial visits are open to all undergraduate and graduate students in the Department, although Part I students will have priority. Numbers for each trip are usually restricted to 20-25 people. Details of each visit are circulated to students by email. Signing up for the visits is done via WebLearn and booking is on a first come, first served basis. Sign-up will open each term on Monday of week 2 at 8.00pm and will close on Monday of week 4 at 8.00pm. If you know that you wish to sign-up for a visit but have an immovable commitment at this time which means that you will be unable to access WebLearn, you should advise your tutor of the reason and then contact the Assistant to the Deputy Administrator (ADA) no later than noon on Monday of week 2 with a request for special consideration to be added manually. The ADA will then liaise with your tutor and confirm the position to you. The coach usually leaves from the Hume-Rothery Building after morning lectures and returns 18:30, depending on travel time to the destination.

N.B.: Health and Safety issues are important on all industrial visits. Make sure you wear sensible clothes, and always follow the instructions given by the guides at the host institution.

Each industrial visit is assessed by means of a word-processed report of a maximum **of 400 words, and 2 supporting diagrams (if appropriate)**. All facts and images should be properly cited. The report must be submitted in hardcopy format to the Assistant to the Deputy Administrator **on the Friday of the week following the visit, between the hours of 11.00 am and 1.00 pm only**. Thus, the report for a 4<sup>th</sup> week visit must be submitted during 5<sup>th</sup> week. Due to the pressure of student numbers, **if you attend a visit you are required to submit a report on it. Failure to submit a report will result in a non-satisfactory mark (0). Such non-satisfactory marks cannot then be superseded by the submission of an extra report based on another Departmentally-organised visit** (but you may submit a report on a self-organised visit providing this is arranged and the report submitted within the agreed timeframe). Remember, you need to have submitted four visit reports before you sit your Part I examination at the end of your 3<sup>rd</sup> year.

In addition to selecting from the Departmentally-organised visits, a maximum of **two** of the assessed visits may be selected from: the Industrial Tour (see Section 11.1), industrial placements (see Section 11.2) or personally-arranged industrial visits. You are actively encouraged to submit a report from at least one visit that is not Departmentally-organised. To be eligible, this **visit must be approved by the Industrial Visit Organiser** and you should email them at least a week in advance of attendance (including any visits arranged during the vacation). If an individual or a group of students wish to organise a personal visit they must provide with their report a letter from a company representative, giving their name(s), the duration of the visit and confirming that they were shown around the site. The letter should be on company paper, and signed. Normally students organise these visits to take place during the vacations; if organised for term-time you should not miss any scheduled classes, lectures, practicals, or tutorials. The submission deadline for a self-organised visit that takes place during a vacation is Friday of week 1 between 11.00 am and 1.00 pm of the term following the visit. The Department does not provide travelling expenses for students on personal visits. A similar letter must be provided if you wish to submit a report on an industrial placement.

The reports are marked by the Industrial Visits Organiser, and are graded **good** (5 marks), **satisfactory** (2 marks) or **non-satisfactory** (0 marks). For this element of coursework as a whole to be judged satisfactory by the Examiners, normally (i) all four reports must be submitted and (ii) the four reports must score an average mark of at least 40%. In total, therefore, completion of 4 good reports will contribute 20 marks towards the Part I mark. Appendix J contains information on the criteria used for assessment. Formative feedback will be given by the Industrial Visits Organiser on the first report that you submit.

Your industrial visit reports are part of the University's examination system; any student caught copying another student's work will be reported to the Proctors who have wide-ranging powers including the power to reduce the class of your degree. **Your attention is drawn to the statement on plagiarism in Appendix A**; you are reminded that this applies equally to text and diagrams/figures.

## **7.2 Practical Work**

Full details on this can be found in Section 10.

## **7.3 Engineering and Society**

MS candidates for Part I who do not opt to take the Foreign Language Option or offer a Supplementary subject must submit a piece of work in the field of **Engineering and Society**. The Engineering and Society coursework requirement this year, under the topic **Entrepreneurship and New Ventures**, is a business plan of 3,000 words or less. This coursework requirement is fully supported by (i) selected lectures from the 'Building a Business' lecture series and (ii) one or two workshops on Entrepreneurship and New Ventures.

Students are strongly advised to attend these lectures and workshops; in addition, there are a series of mandatory tutorials designed to guide the students through the drafting of a business plan. The course will provide an opportunity for individuals to gain experience of creative business thinking, with a focus on commercialization of inventions, using study material relevant to Science and Technology where possible. The course has been developed to achieve a balance between generally applicable business and management skills and those specific to science and technology new ventures. The Building a Business lectures are held in the Nelson Mandela lecture theatre at the Saïd Business School, Park End Street.

The lecturers' presentations are available at: <http://www.sbs.ox.ac.uk/ideas-impact/entrepreneurship/programmes-events/open-and-extracurricular-programmes/building-business>.

The final report must be written as a team project, with the primary author of each section identified. The business plan should be typed and three copies must be submitted with a declaration of authorship to the Chair of Examiners in the Honour School of Materials, Examination Schools, High Street, Oxford no later than noon on the Monday following the end of Hilary Term in the second year (namely, the Monday of 9<sup>th</sup> week). **It should be noted that this deadline may occur during the Industrial Tour, in which case care must be taken by the group to ensure this deadline is met.** The business plan is assessed by a member of the Knowledge Exchange and Impact Team in Research Services, and a member of the Faculty of Materials. Appendix C contains information on the criteria used for assessment.

In Trinity Term, each group is required to make a professional standard presentation (involving all the team members) to members of staff. You should expect to limit your presentation to half an hour, including coping with interruptions and allowing time for questions at the end. These presentations are **not assessed** but are designed to give useful preparatory training for the presentations for the 3<sup>rd</sup> year Team Design Projects. **It should be noted that all the skills learned in this course, with the experience of group project work, will provide a useful foundation for the third year Team Design Projects.**

Normally, to be judged as satisfactory, the Business Plan must score at least 40% and the team must have submitted a written report.

**Your attention is drawn to the statement on plagiarism in Appendix A.**

## 7.4 Team Design Project (TDP)

During the Michaelmas term of your third year, you will undertake a teamwork project. This should take 100 hours for MS students and 75 hours for MEM students. The project will primarily concern design and market analysis, though it may also include limited experimental work if you wish. The project titles will be announced on Friday, 0<sup>th</sup> week, Michaelmas term. Students will be allocated groups and meet the supervisors on Monday, 1<sup>st</sup> week.

The aim of the project is to provide you with experience and insight into the industrial design process. The projects are designed to promote working in teams, i.e. managing a team project, dividing up the work load between team members, and reporting on it regularly. As is common in industry, your design will be constrained by the limited time available, and you will have to work efficiently and enthusiastically to get your final report and presentation ready.

The project is assessed in two ways. First, each group submits 3 copies of a written report, in the form of a design proposal that could be used by a manufacturer as the basis for a marketable product, or by an engineer as the basis for a new process. The final report must be written as a team project, with the primary author of each section identified. The reports should be word-processed and you should allow between 1,000 - 3,000 words (and  $\leq$  12 figures absolute maximum) per team member. Your report should be written in such a way that it can undergo initial evaluation in half an hour. Appendix E contains the marking scheme used to assess Team Design Projects in 2013-14. Second, each group is required to make a professional standard presentation (involving all the team members) to members of staff. Your attitude should regard them as potential board members, i.e. intelligent and influential people(!) whom you wish to convince, but who do *not* know as much as you do about your specialism. You should expect to limit your presentation to half an hour, including coping with interruptions.

The project takes place entirely within the first 3 weeks of Michaelmas term. There are no third year Materials lectures scheduled during weeks 1 and 2 to ensure that MS students can work full-time on the project. Because there are Economics and Management lectures ongoing at this time, MEM students have lower time commitments to the project. However, there is a firm agreement with the Saïd Business School and the Economics Faculty that MEM students will not be asked to engage in tutorial work for these courses, not attend tutorials or classes in these courses during weeks 1 and 2 of Michaelmas term. The Materials Department will remind the faculties of this agreement and we strongly recommend that you politely remind your tutors too in week 0.

All reports must be submitted, together with a declaration of authorship to the Deputy Administrator (Academic) by noon on Tuesday, 3<sup>rd</sup> week Michaelmas term, and the presentations are held on Friday, 3<sup>rd</sup> week Michaelmas term.

Normally, to be judged as satisfactory, the TDP must score at least 40% overall and the team must have submitted a written report and delivered an oral presentation. For an individual candidate, normally the TDP will be judged satisfactory only if the candidate has contributed to both the written report and the oral presentation.

**Your attention is drawn to the statement on plagiarism in Appendix A.**

### **7.5 3<sup>rd</sup> Year Characterisation / Modelling Options Modules (MS only)**

MS students are required to spend the first two weeks of the Hilary term of their third year attending one of two modules which comprise a combination of lectures, demonstrations and practical work. The modules will be assessed as coursework, and the marks will contribute directly to the Part I Examination in Materials Science.

#### **Characterisation of Materials Module**

Assessment will be through a report of 2000-3000 words on an individual portfolio of practical work, which will be marked out of a maximum of 50 marks. Three copies of the report must be handed in to the Deputy Administrator (Academic) by noon on Tuesday of week 3 of Hilary Term.

Normally, to be judged as satisfactory, the report must score at least 40%. Appendix G contains information on the criteria used for assessment.

#### **Introduction to Modelling of Materials Module**

Assessment will be through a combined report of 2000-3000 words on two mini-projects, which will be marked out of a maximum of 50 marks. Three copies of the report must be handed in to the Deputy Administrator (Academic) by noon on Tuesday of week 3 of Hilary Term.

Normally, to be judged as satisfactory, reports on two mini-projects must be submitted and achieve a combined score at least 40%. Appendix H contains information on the criteria used for assessment.

### **7.6 Instructions for submission of coursework at Examination Schools**

The Examination Schools is the University's central point for students to hand in coursework. When submitting work students should ensure that the work (and any declaration) is placed in a sealed envelope with their candidate number (or numbers in the case of group work) clearly written in the top right corner of the envelope. The envelope must be addressed to the Chair of Examiners, and state the full degree course title. A receipt will be issued for all work submitted upon which the date and time of submission will be recorded. **It is the student's responsibility to ensure that their work is submitted by the deadline.**

Therefore, it is strongly recommended that work is submitted in person by the student, rather than relying on post, another student, courier or by leaving the work in the Examination Schools' post-box. Full guidance about the submission procedure at the Examination Schools, including the opening hours, can be found at [www.ox.ac.uk/current\\_students/examinations](http://www.ox.ac.uk/current_students/examinations).

Please see previous sections for details of which pieces of coursework are to be submitted to Examination Schools.

## 8 Foreign Language Option

We recognise that many students who have studied a foreign language may be keen to maintain and develop their language skills during their studies of materials. If you wish to take up the Foreign Language Option, you must have completed the appropriate proforma in Trinity term of your first year. MEM students may study a foreign language (supported by the Department) in their first year only through the additional foreign language study scheme.

The Language Centre ([www.lang.ox.ac.uk](http://www.lang.ox.ac.uk)) offers a range of courses in Arabic, Chinese, French, German, Italian, Japanese, Russian and Spanish as evening classes (**OPAL** courses). The Department may fund the cost for, normally, up to 10 students to attend an evening course. These courses are fast paced and are intended for those who are highly motivated, can commit to regular attendance (80% requirement), are prepared to spend a substantial amount of time each week on follow-up and preparatory work, and are confident that they will not encounter workload problems later in the year. The courses consist of classes for 2 hours per week with 2 hours of independent study in Michaelmas Term and Hilary Term, with project-based component in Trinity Term.

If you have taken a language course in your first year, you may progress the language as the Foreign Language Option, taking the next level course in your second year. You will attend the course throughout Michaelmas and Hilary terms and have a formal assessment by the Language Centre in Trinity term, the marks from which will contribute to Part I. You will not be required to continue with the project phase of the OPAL course throughout Trinity term, although you may do so on a voluntary basis which will lead to a Certificate of Achievement.

For MS students, it may be possible to take a voluntary foreign language course in your fourth year. This course does not contribute towards your degree, but you may be able to obtain a Certificate of Achievement from the Language Centre.

You must register with the Language Centre by Wednesday of week 1. The Department will pay the fees for the second year Foreign Language Option and you will be given a form for the DAA to sign to authorise this payment. You must confirm by the end of week 4 that you wish to take the Foreign Language Option by submitting the completed proforma at Appendix B to the Deputy Administrator (Academic).



If you take the Foreign Language Option instead of the course on Entrepreneurship and New Ventures, you are strongly encouraged to attend the subset of lectures we recommend from the Building a Business course (see [www.science-enterprise.ox.ac.uk/html/activities\\_courses.asp](http://www.science-enterprise.ox.ac.uk/html/activities_courses.asp)) at the Business School. This provides exposure to creative business thinking and generally applicable business and management skills, including those specific to science and technology new ventures. This will provide a useful foundation for the third year Team Design Projects.

## 9 Supplementary Subjects

A Supplementary Subject may be taken in the second year. Anyone who decides to take a supplementary subject can drop the course on “Entrepreneurship and New Ventures” (See Section 7.3).

The Supplementary Subjects are advertised each year and are currently (for synopses see the websites indicated):

- Quantum Chemistry (<http://course.chem.ox.ac.uk/quantum-chemistry-mt.aspx>)
- History and Philosophy of Science (<http://course.chem.ox.ac.uk/history-and-philosophy-of-science-mt.aspx>)

Each course is taught via a programme of lectures and classes, held throughout Michaelmas Term and Hilary Term, and is normally examined by a 3-hour written examination paper sat at the end of Hilary Term.

If you wish to take a Supplementary Subject instead of following the course on “Entrepreneurship and New Ventures” you must discuss this with your Tutor and complete the proforma found at 0. This form must be submitted to the Deputy Administrator (Academic) by the end of week 4 of Michaelmas Term. You must also ensure that you enter for the Supplementary Subject examination when you register for your examinations through your college.

**If you take a Supplementary Subject instead of the course on Entrepreneurship and New Ventures, you are strongly encouraged to attend the subset of lectures we recommend from the Building a Business course (see [www.science-enterprise.ox.ac.uk/html/activities\\_courses.asp](http://www.science-enterprise.ox.ac.uk/html/activities_courses.asp)) at the Business School. This provides exposure to creative business thinking and generally applicable business and management skills, including those specific to science and technology new ventures. This will provide a useful foundation for the third year Team Design Projects.**

## 10 Practicals

Set experiments are conducted in the Teaching Laboratory in the first two years for MS and first three years for MEM students. The experiments are done by students in small teams (teams of three or pairs). The first two terms sees several teams working on the same experiment in parallel, using separate sets of apparatus, with all teams completing that experiment over a two-week cycle. The exceptions to this are experiments run in Trinity term which use equipment, such as electron microscopes, that is too costly to duplicate.

The Practical Class Organiser is Professor Keyna O'Reilly; she has overall responsibility for the smooth running of the practicals and for applying any penalties such as those incurred for late submission of a report. The Teaching Laboratory is open only in the afternoons. At the start of each practical the Senior Demonstrator (SD), who is normally a member of staff or a postdoctoral researcher, will give a full briefing on the theory and practice of each experiment, safety issues, what is required in the report and the arrangements for marking. The Practical Class Technician (PCT) and a Junior Demonstrator (JD) who is a specialist in the current experiment will be present throughout the course of the experiment. The SD will be present for periods throughout each experiment.

The requirements for the reports will differ a little from one experiment to another, as will the emphasis on particular requirements. Do make sure that by a combination of the briefing and the instruction sheets you understand what is required for each specific experiment. You have been provided with hardback practical notebooks (hereafter referred to as the "practical book") which you should use whenever you are in the lab to record your data, observations, results of any analysis, etc.

Following good practice in research and industrial labs, all entries should be legible, written in pen and if you make a mistake, just draw a line through the entry. There are some really good housekeeping tips on keeping practical books at <http://colinpurrington.com/tips/academic/labnotebooks>.

There is a prize of £250 for the best overall performance for MS and MEM students in practicals awarded by Tata Steel.

**Please note that the Department has recently undertaken a full review of the practical labs and proposals for revisions are pending approval. As a result, there may be some changes to the content of this section during the year; these changes will be clearly communicated by the Practical Class Organiser (PCO) at the start of each term, and also confirmed via email.**

## 10.1 Safety in the Teaching Laboratory

Every effort has been made to make the laboratory a safe place in which to work. However, you also have an obligation to help. Below is a list of 'do-s and don't-s' that you should follow:

**DO** pay attention to the teaching class technician and the demonstrators.

**DO** read and follow the safety instructions.

**DO** familiarise yourself with fire escape routes.

**DO** keep fire doors closed and escape routes clear.

**DO NOT** eat, drink or put on make-up in the laboratory.

**DO NOT** use your mobile phone.

**DO NOT** mouth-pipette or lick things.

**DO NOT** smoke in the laboratory.

**DO** wear appropriate eye and hand protection.

**DO** wash hands after working with chemicals.

**DO** work in the fume cupboard with etchants and solvents.

**DO** use minimum quantities of flammable liquids.

**DO** keep the laboratory clean.

Note: it is important that the only language spoken in the Teaching Labs is English - whether that be student-to-student or JD-to-student - such that if incorrect (and potentially unsafe) instructions are given, there is a better chance someone overhearing them will realise and be able to act.

## 10.2 Practicals in the Second Year for MS Students

MS students do four practicals per term in their second year, giving twelve practicals in total.

Practicals in the second year take three afternoons each to complete and in Michaelmas and Hilary Terms are carried out on Monday, Tuesday and Wednesday afternoons. The experiments in Trinity Term are timetabled differently. Details of teams and timetabling are arranged at a meeting on Monday of first week each term.

**Completion of all practicals, including submission of reports, is a requirement for Part I of the final examination.** The practical marks contribute directly to the final mark for Part I. For this reason, candidates for MS Part I will be required to submit the Materials Practical Class reports and practical books to the Chair of Examiners in the Honour School of Materials Science, c/o the Deputy Administrator (Academic) in the Department of Materials, not later than noon on the Tuesday of the second week of Michaelmas Full Term in the year of the second public examination. Practical books and reports are **not** returned to students after the Part I examinations.

The following practicals are provided:

- Materials Selection
- Dislocations & Plasticity
- Casting
- Steels
- Diffusion
- Semiconductor Devices
- Corrosion
- Extrusion
- Fracture and Scanning Electron Microscopy
- Transmission Electron Microscopy
- Atomic Force Microscopy
- Mechanical Properties of Polymers

Information about these practicals can be found on the Departmental website at

[www.materials.ox.ac.uk/teaching/ug/ugpracticals.html](http://www.materials.ox.ac.uk/teaching/ug/ugpracticals.html).

### **10.3 Practical in the Second and Third Years for MEM Students**

MEM students do nine of the practicals taken by 2<sup>nd</sup> year MS Students, five in their second year and four in their third year. Practical in the second and third years take three afternoons each to complete and in Michaelmas and Hilary Terms are carried out on Monday, Tuesday and Wednesday afternoons. The experiments in Trinity Term are timetabled differently.

Details of teams and timetabling are arranged at a meeting on Monday of first week each term. In Michaelmas Term of the third year, this meeting as well as the practicals will be scheduled after the Team Design Project in weeks 1-2 (see Section 0).

**Completion of all practicals, including submission of reports, is a requirement for Part I of the final examination.** The practical marks contribute directly to the final mark for Part I. For this reason, candidates for MEM Part I will be required to submit the Materials Practical Class reports and practical books to the Chair of the Examiners in the Honour School of Materials, Economics and Management, c/o the Deputy Administrator (Academic) in the Department of Materials not later than noon on the Tuesday of the second week of Trinity Full Term in the year of the second public examination. Practical books and reports are **not** returned to students after the Part I examinations.

### **10.4 Absence from Practical Labs.**

If you miss a scheduled session in the teaching laboratory your tutor will be informed. Any student who misses a scheduled practical class must inform the PCT of the reason as soon as possible. It is a requirement for every student to sign-in on each day of the practical that they attend and it is **your responsibility** to ensure you have signed-in each day. If the whole practical is missed then the DAA must be informed. The student must provide appropriate written evidence for a valid

reason that the practical session has been missed, or if the student is unable to complete a report for some reason. Appropriate evidence includes a medical certificate to cover illness (details of the illness need not be specified by the doctor but he or she must state that in their opinion you are/were unfit to attend the practical class / write-up the report by the deadline) or a signed letter from a College Tutor to cover other circumstances. Normally no later than one week after the missed session or missed report deadline you should provide one copy of this evidence to the DAA (Philippa Moss) and one copy to the PCT (Paula Topping). The latter copy will be passed to the PCO (Professor O'Reilly). Subsequently your college will need to present this evidence in any case they might make to the Proctors in respect of missing examinable coursework.

### 10.5 Reports for Practicals

For each experiment, a report must be handwritten in ink on loose-leaf sheets of paper; computer-drawn graphs and tables, and photographs may be affixed by glue but the text must not be typed or word-processed (unless you have been granted express permission to do so). Marking is carried out by the SD with the student present for oral discussion at a scheduled time, normally within two weeks of submission of the report. Your marked report will be returned to you, normally at the point when you submit the report for the next practical. You must retain these reports as you are required to submit these to the examiners, together with your practical book, as detailed above. Whilst practicals are performed in pairs / threes in the laboratory, all write-ups should be completed, as far as possible, individually.

All work must be completed and handed in for marking before the end of term, except for students timetabled to start an experiment in 8<sup>th</sup> week of each term for whom special arrangements are made for this last experiment of the term. The practical books are the property of the Department and are kept here over vacations. They are made available to the Examiners, together with the marked reports.

### 10.6 Submission of reports and marking arrangements

The practical report must be written on loose-leaf paper within ~7 days of the starting date of the experiment. Each page of the report must give the page number and the total number of pages in the report, i.e. page 3 of 4. You must submit the report, **together with a photocopy of the original report**, with your practical book, to the Assistant to the Deputy Administrator (ADA), Emma Purves, for date stamping. The ADA will retain the reports to pass on to the SD for marking. The ADA will be available in her office to receive your reports and date-stamp your practical books normally between 11.00 am – 1.00 pm on Wednesdays throughout term. The PCO will confirm this time slot at the start of each term. Do not expect the ADA to receive reports and date-stamp practical books outside these times. Late submissions without good reason will incur penalties as described in Section 10.7 and your tutor will be informed.

Special arrangements are made for students whose experiments start in 8<sup>th</sup> week and details will be sent by email before the end of term. You are required to post your reports to the Deputy Administrator (Academic) by the stated deadline, retaining proof of postage. There have been instances where reports have gone astray / been lost in the post, therefore it is recommended that you take and retain a further photocopy before sending it. You are required to submit your practical book to the ADA before you leave at the end of term, having taken a photocopy of the data and notes in your practical book to use in writing the report.

For practicals to be marked during term, the marking sessions will be arranged for you to discuss your work with the Senior Demonstrator responsible for marking it, normally this will be within 2 weeks of submission. You will need to sign-up for your marking session via WebLearn, ensuring that the time chosen from those on offer fits in with your other commitments such as tutorials. The SD will provide feedback, grade your report and give it a mark out of 10. Non-attendance at marking sessions for which you have signed-up, or if you fail to sign-up for one of the sessions offered, will incur penalties as described in Section 10.7 and your tutor will be informed.

**N.B. YOU MUST NOT START AN EXPERIMENT WITHOUT PERMISSION.** In practice, this means you must not begin the experimental work before the PCT has date stamped your book. This requirement arises in order for the Department to comply with the Health and Safety regulations; this date stamping will take place immediately after the SD's briefing, during which s/he and the PCT will have covered the relevant safety issues and highlighted any particular hazards. It is **your responsibility** to ensure that your book is stamped at this time. Any student starting an experiment without permission will be penalised (see Section 10.7) and will be liable to disciplinary action.

### **10.7 Penalties**

The writing of reports and marking arrangements are simple and straightforward. Unfortunately, without a sanction, a small minority of students will choose not to comply. To assist the smooth running of the Class and in fairness to other students, there is a system of penalty marks.

1. Cheating is a Proctorial Offence. Your practical reports are part of the University's examination system; any student caught copying another student's work will be reported to the Proctors who have wide-ranging powers including the power to reduce the class of your degree.

For more information on the seriousness of plagiarism see Section 10.9 and Appendix A.

2. Other penalties are imposed by recommending that the Part I Examiners deduct marks from those awarded by the SD, as listed below:

**(a) Starting an experiment without permission:**

4 penalty marks.

**(b) Late submission of report in the absence of illness or other legitimate mitigating circumstances:**

If the report and practical book are submitted late for completion date stamping (i.e. later than 1.00 pm on the Wednesday of the week after the starting date):

1 penalty mark for each week or part of a week the report is late. If within 4 weeks of the scheduled starting date a practical is not carried out, or within 4 weeks of the actual starting date the report and practical book are not submitted and completion date stamped, then a default mark of zero will be awarded and no feedback will be provided.

**(c) Failure to turn up for a marking session:**

If a student fails to turn up for their oral marking session for any reason other than illness or other legitimate mitigating circumstances then they will have forfeited the opportunity for an oral marking session. One final opportunity for marking, without the benefit of oral feedback, will be offered provided the report is submitted for this purpose to the Deputy Administrator (Academic) no later than 4 weeks after the start of the practical in question. A practical marked in this way will be given 2 penalty marks unless it was scheduled to start in 7<sup>th</sup> week or later. If a student fails to book an available oral marking session from those initially offered by the SD then this will be treated as though an arranged marking session had been missed. For students who miss their scheduled marking session and fail to hand in their book for 'marking without benefit of oral feedback' within the stipulated time a default mark of zero will be awarded and no feedback will be provided.

**(d) A practical marked without a completion date stamp:**

1 penalty mark. (An exception will be a practical marked within 7 days of the starting date and where the SD has dated the marking as proof.)

**(e) Failure to hand in a practical book at the end of term:**

4 penalty marks. (N.B. Students must hand in their practical books to the DAA at the end of term for safekeeping.)

**(f) Loss of a practical book:**

It is the responsibility of the student to look after the practical book and marked reports during term. If a student loses the practical book then they should inform the DAA as soon as possible. Any outstanding experiments must still be written up and marked. The penalty for a lost practical book will be determined by the Part I Examiners after consultation with the Proctors.

## 10.8 Satisfactory Performance in Practicals

Examination Regulations require satisfactory completion of Coursework. With Materials Science being a practical subject, the full set of Practical Classes is an essential component of the coursework. To be judged satisfactory, candidates must normally have achieved at least 40% overall, and have submitted a report for marking on each of the practicals listed in this course handbook (see Sections 10.2 and 10.3 above). The examiners may consider that non-submission of even one report indicates a lack of engagement with the practical side, and deem performance to be non-satisfactory.

## 10.9 Plagiarism

Information from the University's Proctors and Assessor on plagiarism is provided in Appendix A. This information can be applied to all aspects of assessment during the course.

## 11 Other Course-related Events

### 11.1 The Industrial Tour

Normally, the JCCU organise an industrial tour during the Easter vacation. Destinations have included Germany, Finland, Hong Kong, Japan, California, The Netherlands, Italy, China and the most recent tour was to Poland. All of these tours were very enjoyable, as well as being extremely valuable in terms of the scientific, technical and cultural experience gained. The Department is keen to encourage further such initiatives. Suggestions should be made via the JCCU. Reports and photographs from recent industrial tours can be viewed at [www.materials.ox.ac.uk/teaching/tour.html](http://www.materials.ox.ac.uk/teaching/tour.html).

### 11.2 Summer Vacation Projects in Industry and University Research Laboratories

In addition to attending departmentally-organised industrial visits in the second and third years, all students are strongly encouraged to undertake a vacation placement in industry during their course. A short report on this (if accompanied by a letter from their line manager confirming they were employed by the particular company in question) can substitute as one of the required 4 industrial visit reports submitted during Part I.

The Department also coordinates a number of partially-funded opportunities to study in research laboratories at overseas universities. Details are provided at the Hilary Term briefing mentioned below. Usually opportunities are available in the USA (MIT and UC Santa Barbara), China (Tsinghua), Japan (Tokyo Institute of Technology) and Germany (Bochum).

The ideal time to undertake this summer project / placement is during the second long vacation. You should make all the arrangements yourself, usually during the course of your second year. To qualify as the subject of an industrial visit report the placement **should have a substantial materials content**. If you have arranged your project / placement in good time, you can apply for



external financial assistance from the grants made to us by the Ironmongers' and the Armourers and Brasiers' towards travel and accommodation.

All applications for financial assistance must be made through the Director of Studies; ideally, these should be made as soon as possible in Hilary term. Further advice on finding a project / placement can be gained from the Director of Studies. A lunchtime talk will be arranged early in Hilary Term of the second year. You **must** attend this talk if you wish to be considered for placement / project opportunities coordinated by the Department.

## **12 Teaching and Learning throughout your Degree**

Both the MS and MEM course are accredited by the Engineering Council at M.Eng level. The aims and objectives of each course are shown below in Table 7.

**Table 7: Aims and Objectives of the Course**

<b>Materials Science</b>	<b>Materials, Economics and Management</b>
<ul style="list-style-type: none"> <li>• to provide a course of the highest academic quality in Materials Science in a challenging and supportive learning environment that attracts the best students from the UK and elsewhere;</li> <li>• to provide students with a broad, balanced knowledge of Materials Science, supported by the necessary background science;</li> <li>• to develop transferable skills related to problem solving, communication, practical experimentation, and computing;</li> <li>• to bring students to a position on graduation that allows them to choose confidently from many careers, whether within Materials Science or not, and enables them to contribute rapidly to their chosen employment. This includes bringing them to a position to start graduate study for a research degree at a leading university either in the UK or overseas.</li> </ul>	<ul style="list-style-type: none"> <li>• to provide a course of the highest academic quality in Materials Science, Economics and Management in a challenging and supportive learning environment that attracts the best students from the UK and elsewhere;</li> <li>• to provide students with a broad, balanced knowledge of Materials Science, Management studies and Economics supported by the necessary background science, mathematical and statistical techniques where appropriate;</li> <li>• to engage and enhance the critical skills of the students by the pursuits of specialist options via Management, Economics and Materials option papers;</li> <li>• to develop transferable skills related to problem solving, communication, practical experimentation, and computing;</li> <li>• to bring students to a position on graduation that allows them to choose confidently from many different careers, whether within Materials Science, industry or neither, and enables them to contribute rapidly to their chosen employment. This includes bringing them to a position to start graduate study for a research degree at a leading university either in the UK or overseas.</li> </ul>

## 12.1 Learning Development, Study Skills and Tutorials

**Learning Development** is the gradual process by which students become increasingly competent, independent and sophisticated in their approach to their studies. This comes from a combination of increasing experience of being responsible for your own learning, picking up ideas from fellow students, both your peers and those more senior to you, and by guidance from your college tutor. Partly the increasing sophistication is driven by the structure and content of your 4-year MEng degree programme. For example, in year 1 you began to develop basic laboratory skills in groups of three by following straightforward 6h practicals according to written instruction sheets, in the third year you carry out a two-week full time open-ended team design project where your team is devoting 600 person hours to a task defined only in outline in a couple of hundred words. Then in your final year you carry out a six or eight month full-time individual research project and write this up in a thesis of about ten to twelve thousand words (100 pages).

Early in Michaelmas term of your first year the Director of Studies and a College Tutor run a short workshop on “Teaching, Study Skills and Learning Development in the Context of the Materials Degree Programme”. The process of learning development is broad, ranging from the acquisition of basic study skills and knowledge to the development of high levels of academic rigour and critical ability – from the generic to the subject specific.

Your course has been designed with this in mind and will provide opportunities for you to develop a wide range of skills. Further information about these skills, together with details of how they are assessed, can be found in Appendix L and in the programme specifications at [www.materials.ox.ac.uk/teaching/ug/ugprogspecs.html](http://www.materials.ox.ac.uk/teaching/ug/ugprogspecs.html).

Of all the **Study Skills** that you will develop, that of organizing your time (both apportioning it and using it efficiently) is one of the most important.

Initially this might be as simple as getting to a lecture on time, but very quickly, early in your first term, means thinking ahead over a period of two or more weeks to make sure that as well as attending scheduled lectures, tutorials and classes, you give appropriate time to preparation in advance of and submission of written work for: tutorials, maths classes, crystallography classes, and practical classes plus the associated lab reports. Your social life and other interests need to be factored-in too. In Trinity term you will need to organize your revision for the written examination.

In your second and third year the pace and volume of all this quickens and there will be longer term objectives to factor-in such as arrangements for a voluntary summer placement, writing joint reports on extended pieces of team-based coursework (and submitting them by the deadlines).

Then in the final year you will apply simple project management techniques to help you make best use of the fifteen hundred hours that you will devote full-time to your Part II research project. Thus you begin simply needing to get to the next day's lecture on time, and three years later you will start your 4<sup>th</sup> year project by mapping out what you will do over the subsequent eight months!

The on-line bridging programme includes a study skills module on time management which you may find helpful. [It is intended to add more study skills modules in the future.]

**Tutorials** are a key part of your programme and are compulsory. They are the responsibility of your college and you will receive guidance from your college tutor on how to make best use of this resource. Many of the tutorials are given by senior members of the Faculty of Materials but some will be given by younger staff and by research students. In small groups, typically of two or at most three students, you will discuss topics on which you have submitted written work in advance. The written work is based on question sheets issued by the course lecturers and typically you will spend 6 to 8 hours on the written work for a one-hour tutorial. Your tutors will also discuss additional topics as they judge appropriate and of course you may raise specific topics yourself. Thus the tutorial is a key resource to help you to develop an in-depth understanding of and ability to apply the material you are introduced to in lectures. The feedback you will gain during tutorials should help you to judge your progress and to identify areas of strength and weakness in your understanding. Your tutor will offer guidance on how you might improve your understanding of and insight into our subject.

The University's Education Committee summarises the purpose of tutorials as follows:

"To develop an individual student's capacity to think in depth about a subject area, and to operate with growing confidence within its techniques and methodologies, with the expectation that the process will promote increased understanding of the discipline for both tutor and student".

This Committee also notes that "feedback should be seen as a key characteristic of tutorial teaching and a routine expectation".

## **12.2 Research-Teaching Nexus**

The Department of Materials has an international reputation for its research profile and this University believes that there are many benefits to the teaching of its courses that are a consequence of this high level of research activity. The tutors and lecturers with whom you will interact during this course are not only employed to teach you, but are also (in nearly all cases) actively engaged in the direction of, or participation in, one or more of the wide range of research projects that contribute to the Department's research reputation. Many of the individual academic staff in this department are recognised internationally as leaders in their own field of specialisation.

The impact of research on teaching in this department may take many forms: tutors and lecturers including their own data or ideas from research in their teaching; the regular updating of reading lists and curricula to reflect research developments; the development of research skills and research-based approaches to study through your participation in research projects (particularly in the 4th year of your degree); special topics provided as options in year 3; the use of research equipment in practical classes; access to research seminars in the later years of your course; opportunities to visit academic and research facilities outside Oxford; the many opportunities to meet with research students and members of the faculty, particularly at the research project stage; experience of preparing research reports including papers for external publication in some cases. In general, you will be encouraged to develop the ability to interpret and critically appraise new data, to critically appraise research literature, and to build the sense that scientific knowledge is contestable and that its interpretation may be continually revisited.

## **13 Teaching Norms**

Please note that these teaching norms are for guidance only. Your college tutor will advise you more specifically on matters such as the amount of time you devote to private study and revision, and may vary the number of tutorials given on a particular lecture course based on his/her judgement of your needs. You should also note that it is an expectation of the Oxford Materials Programmes that you engage in private study and/or revision during part of each vacation. Tutorials and Maths & Materials Options Classes are nominally one hour in length although classes may vary from 1-2 hours. Tutors may vary this to suit individual courses or needs.

### **13.1 Lectures & Laboratory Classes (as detailed in the General Scheme)**

Lecture loads, including introductory talks, industrial talks and transferable skills workshops, are as scheduled in the General Scheme of Lectures, which can be viewed on the Oxford Materials website. For the Materials Options you will select three 12h courses per term (MT & HT of the third year for MS and HT of the fourth year for MEM). For the Part II MEM Economics/Management Options you will select one course (typically of the order of 36h duration).

Laboratory classes are scheduled for two 3h sessions per fortnight for first years (ten practicals in total) and three 3h sessions per fortnight for second year MS Part I students (12 practicals in total). MEM Part I students have a lighter load (9 practicals in total) and this is spread over their second and third years. In the alternate weeks for which you are not scheduled to carry out a practical you will be writing the report on your most recent practical and should expect to spend about 6-8h per report. The face-to-face marking/feedback session will typically take 45 minutes per practical per group of three students, although this will vary depending on whether the Senior Demonstrator chooses to mark the report in advance or during the face-to-face session. Some Senior Demonstrators will, instead of an oral marking session, provide written feedback on your report.

The load involved in the Foreign Language Option is described in a separate section of this handbook.

## **13.2 Tutorials**

Tutorials form a very important component of teaching at Oxford. Each college makes provision for its own students. College Fellows and other academic staff carry out most of this teaching themselves, usually with pairs of students but sometimes in singles or groups of three.

In the first year, students have about 3 tutorials per examination paper per term, except in subjects where Departmental classes are provided.

In the second year, tutorials are assigned to different areas of the syllabus at a rate of about 1 per 4 lectures, varied as thought appropriate by individual tutors. Each tutorial requires about 6-8 hours of preparatory work by the students.

Thus, a typical term's lecture load of 60 hours would require 15 tutorials, involving about 105 hours preparation, or 13 hours per week. In this Department most tutors coordinate their teaching closely with the lecture programme, seeing that students complete appropriate exercises (usually question sheets devised by the course lecturers) as the lectures progress, and that any problems are cleared up promptly.

Management and Economics Tutorials / Classes are given to 2<sup>nd</sup> and 3<sup>rd</sup> year MEM students at a similar rate of approximately one per 3 or 4 lectures. The preparation time for each of these tutorials / classes may be more than for the Materials tutorials – your Management and Economics tutors will advise you on this. It is important to note that during weeks 1 and 2 of Michaelmas Term, Y3 MEM students will be undertaking the Team Design Project. Because of the concentrated workload attached to this, you will not be required to engage in tutorial work or attend tutorials for the Management and Economics lecture courses, although the lectures will be held as normal. For the Microeconomics lecture course, there are also Microeconomics Maths classes, normally held in weeks 1 and 2 of Michaelmas Term which you are also not expected to attend. For the General Management course, you are only expected to receive 8 of the 16 tutorials offered across Michaelmas and Hilary Terms. There is long-standing agreement for these arrangements between Materials, Management and Economics. However, to ensure the same pattern is followed each year, when there may be a change in those delivering tutorials, we advise you to politely remind your tutors in week 0 of Michaelmas Term.

Each tutor has the flexibility to teach each group in a way to meet the needs of the individual students. There is a Tutors' Committee in the Department, which is a forum to solicit opinions, discuss common problems and coordinate actions on a termly basis. The current Chair of the Tutors' Committee is Professor Peter Nellist.

### **13.3 Maths Classes and Materials Options Classes**

These classes typically involve groups of 6 to 10 students. First and second year students take Maths Classes (organized by Professor Marina Galano); these are normally at the rate of one class for every two maths lectures, which is an average of about one class per week. Third year MS and fourth year MEM students take Materials Options classes (co-ordinated by the office of the Deputy Administrator [Academic]); there are three classes per 12h lecture course.

### **13.4 Other Coursework and Final Year Projects**

- (i) Industrial Visits – typically 3 to 5 hours for each of four visits and 1.5 hours writing per report.
- (ii) Business Plan – typically 20h writing up time for the Business Plan
- (iii) Team Design Project – typically 100h for an MS student or 75h for an MEM student, in both cases including writing the team report.
- (iv) Characterisation of Materials or Introduction to Materials Modelling module – typically 100h, including writing the report(s).

### **13.5 Final year Part II Projects**

Detailed guidance is issued for Materials Science students in the MS Part II Handbook (see Oxford Materials website), and for Materials, Economics & Management students in the E(M)EM Project Handbook (issued by the Said Business School).

For the MS Research Project, typically you will spend 40h per week in the laboratory and should expect to hold regular meetings with your supervisor. These meetings will normally be held at least every two weeks for the duration of the project but significantly more intensive support is usual in the initial and final stages of the project. You are also likely to spend additional time in private study outside of the laboratory. The MEM Management Project involves a twenty-four week full-time placement in a company.

### **13.6 Revision**

Revision classes are scheduled for some courses, such as the first year Maths Course (8 revision ‘lectures’). Revision tutorials are often arranged too, typically at a rate of 3 to 4 tutorials per paper. During the formal revision periods in Trinity Term and in part of the Easter Vacation preceding the Part I Examination it is not unusual to study for 60h per week.

## **14 Libraries**

Do not think that a complete set of lecture notes for a course removes the need to consult textbooks. You will need constant access to books in the course of your studies, for clarifying points made in lectures, doing things in different ways, helping with problems and so on. The reading lists issued as part of the lecture synopses are revised regularly, and contain a range of suggestions, including alternatives and suggestions for further reading.

There are three types of library provision available to undergraduates:

- **College Libraries**, which provide books for members of the College. Most Colleges that accept undergraduates in Materials have good collections of undergraduate textbooks in the subject. If you find that a book you require is not stocked by your College library, please consult your College Tutor or College Librarian. Often the book will then be added to the library.
- **The Radcliffe Science Library (RSL)**, which is a UK Copyright Library, with a large collection of books and journals, and extensive reading rooms. The RSL is both a lending and reference library. You need a University Card to be admitted to the RSL. Students register through their Colleges to use the RSL.
- **The Departmental Library**, where we aim to stock all books recommended for individual lecture courses in Materials. We also have many other textbooks, monographs, conference proceedings, key materials journals and some electronic publications. A lending service is offered to students. Further information about the library can be found on the Departmental website, at [www.materials.ox.ac.uk/library/index.html](http://www.materials.ox.ac.uk/library/index.html). **For undergraduates this library is considered to be a secondary support system to the other libraries**; its purpose is **not** to stock multiple copies of all course books.

Many of the books are kept for use in the library only so students can study in between lectures / practicals etc. The “reserve copies” of key course textbooks are kept in the Librarian’s office. THE DEPARTMENTAL LIBRARY ALSO PROVIDES A STUDY AREA AND IS EQUIPPED FOR WIRELESS INTERNET ACCESS.

## 15 Computing

### 15.1 Facilities available

The use of computers forms an important element in our degree courses. The Teaching Laboratory contains a suite of networked, PC-compatible computers and peripherals with a wide range of software, including teaching software for materials science. Most colleges provide computing facilities for undergraduates, and computing facilities are also provided centrally at IT Services (ITS).

Students are expected to access the internet frequently for communicating by email and for searching for information on the web. There is lots of useful information on the Department's website at: [www.materials.ox.ac.uk](http://www.materials.ox.ac.uk).

The teaching of computing is part of the undergraduate courses. An introduction is available in the first year. Some practicals have a computing element either in carrying out the experiment or in processing the results.



Computers are widely used in libraries. The Departmental Library has facilities for online searching of the library catalogues within the University. There is also online access to databases of papers on materials science topics published in scientific journals, which are updated regularly. Papers on topics of interest can be found either in the Departmental Library or in the Radcliffe Science Library. Many journals are also available online from any computer on the University network. ([www.materials.ox.ac.uk/library](http://www.materials.ox.ac.uk/library))

The Department also has a Materials Modelling Laboratory with several linux HPC clusters (see <http://mml.materials.ox.ac.uk/>) and the University also provides larger facilities for Advanced Research Computing (see <http://www.arc.ox.ac.uk>).

## 15.2 Use of the Internet Facilities

Access to the internet is encouraged by the university provided it is solely for legitimate academic purposes. All users of networked services should read the regulations that further define permissible use and access, which are given in full in Appendix M.

Please remember that because of abuses in the past the levels of logging and auditing are now so high on most service providers that your every keystroke and action can be traced with milli-second accuracy. The penalties that are being imposed can range from fines, suspension of accounts, rustication (in the Oxford sense) to prison sentences and a criminal record. If you are the victim or target of unacceptable behaviour contact the Senior IT Officer and prompt action will be taken to resolve the problem.

## 15.3 Email

All undergraduates are provided with an email address by ITS but arranged through their colleges. Every student is allocated an oxford username consisting of 8 characters. The first four are an abbreviation of the College name, and the last four are a four digit number. The email address for the account will be easier to remember, and is usually of the form

`firstname.lastname@college.ox.ac.uk`

The Department uses email to communicate with undergraduates about many important matters, such as industrial visits (see Section 7.1), changes in lecture venues, etc. It is therefore very important that you check your email regularly; if you don't, you might miss useful messages. In addition, if you have too many unread messages, your disk quota will be exceeded, and eventually (after 7 days) messages sent to you will bounce back. You can also use email to contact members of staff quickly (see Table 1).

## 16 The MS Part II

The MS Part II project is a full-time research project lasting nine months from mid-September to mid-June of the fourth year. The results are presented in a thesis of not more than 12,000 words, and an oral examination based on it is held towards the end of June.

Your attention is drawn to the statement on plagiarism in Appendix A. Further details are given in the Part II handbook which is issued at the start of the project.

The project is supervised either by a member of staff or by someone approved by the Faculty of Materials. Nearly all the research facilities within the Department are, in principle, available to Part II students. Projects are usually carried out in the Department with prior approval but they can also be carried out in UK industrial laboratories or overseas. There is a prize of £250 and a medal from the Armourers and Brasiers' Company for the best Part II project.

All Part II MS students are required to give a 15 minute talk on their work to the Department at the beginning of Trinity Term. A prize of £250 and a medal is awarded by the Worshipful Company of Ironmongers for the best talk. Part II students are also encouraged to attend some graduate lecture courses, the programme of which is published in the Lecture List. Other broader skills training will be provided.

MS students will be allocated a Part II project during their 3<sup>rd</sup> year. They will receive a booklet of proposed project descriptions at the end of Michaelmas Term, and are required to attend an open day on Tuesday of 4<sup>th</sup> week of Hilary Term during which they will have an opportunity to discuss projects with potential supervisors. Following the open day students will complete a Part II Project Preference Form on which they are able to make a selection of three projects in order of preference. The Part II Project Organiser, Professor Keyna O'Reilly, will then allocate projects to students such that as many students as possible are able to carry out their first or second choice project.

## 17 Important dates and deadlines

A list of important dates and deadlines is provided at the front of this handbook. The information is based on the current regulations, and details may vary. The start dates for examinations are provisional. In general, all coursework must be submitted at the Examination Schools, addressed to the relevant Chair of Examinations, and stating your examination number and degree course, **not** your name or College. The exceptions to this are: the Team Design Project reports, which are not anonymous (as groups also do presentations) and should be submitted to the Deputy Administrator (Academic); the industrial visit reports, which should be submitted to the Assistant to the Deputy Administrator, and the MS Part II thesis, which whilst submitted at the Examination Schools, is obviously not anonymous.

## 18 Examinations

Your attention is drawn to the statement on plagiarism in Appendix A.

During your four-year course, there are 3 sets of examinations. You have already sat your Preliminary examinations at the end of your first year. The Final Examinations are in two parts, Part I at the end of the third year and Part II at the end of the fourth year. You must be considered capable of being awarded an honours degree after Part I in order to be allowed to enter Part II. The degree classification is based on the combined results of Part I and Part II.

The marks for Part I and Part II examinations conform to the University's standardised expression of agreed final marks, as follows:

70-100	First Class
60-69	Upper Second
50-59	Lower Second
40-49	Third
30-39	Pass
0-29	Fail

With the qualitative descriptors for each classification level being:

- Class I** The candidate shows excellent problem-solving skills and excellent knowledge of the material over a wide range of topics, and is able to use that knowledge innovatively and/or in unfamiliar contexts.
- Class Iii** The candidate shows good or very good problem-solving skills, and good or very good knowledge of much of the material over a wide range of topics.
- Class Iiii** The candidate shows basic problem-solving skills and adequate knowledge of most of the material.
- Class III** The candidate shows reasonable understanding of at least part of the basic material and some problem solving skills. Although there may be a few good answers, the majority of answers will contain errors in calculations and/or show incomplete understanding of the topics.
- Pass** The candidate shows some limited grasp of basic material over a restricted range of topics, but with large gaps in understanding. There need not be any good quality answers, but there will be indications of some competence.
- Fail** The candidate shows inadequate grasp of the basic material. The work is likely to show major misunderstanding and confusion, and/or inaccurate calculations; the answers to most of the questions attempted are likely to be fragmentary.

The Examination Conventions for MS and MEM 2013-14 can be found in Appendix N and Appendix O respectively. The Examination Conventions for 2014-15 will be based on these documents but may not be identical.

### **18.1 Final examinations for MS**

Part I consists of four general papers based on the four core subject areas, and two papers based on the third year Options. Each paper is of three hours duration. In addition, the marks for practicals, industrial visit reports, Engineering and Society coursework, the Characterisation of Materials or Modelling of Materials module, and the Team Design Project are all taken into account (Table 8). To achieve Honours in Part I it is necessary to obtain a minimum mark of 40% averaged over all elements of assessment for Part I, AND obtain a minimum mark of 40% in each of at least four of the six written papers sat in Trinity term, AND satisfy the coursework requirement as detailed in the Examination Regulations 2013. The Examination Conventions for MS for 2013-14 are shown in Appendix N.

Marks in Part II are awarded for the thesis. There is an oral examination based on the thesis. Table 8 shows the total number of marks allocated to different components of the examination. The examiners have the power to vary the number of marks, but you will be told of any change in the marking schemes shown.

**Table 8: Summary of marks to be awarded for different components of the MS Final Examination in 2014, subject to confirmation by the examiners**

	<b>Component</b>	<b>Mark</b>
<b>Part I</b>	General Paper 1	100
	General Paper 2	100
	General Paper 3	100
	General Paper 4	100
	Materials Options Paper 1	100
	Materials Options Paper 2	100
	Practicals	60
	Industrial visits	20
	Engineering and Society coursework	20
	Team Design Project	50
	Characterisation or Modelling module	50
	<b>Part I Total</b>	<b>800</b>
	<b>Part II</b>	Thesis
<b>Overall Total</b>	<b>1200</b>	

## 18.2 Final examinations for MEM

Part I consists of four general papers based on the four core subject areas (see Section 6), two Economics papers (Introductory Economics and Microeconomics) and one Management paper (M1, General Management). In addition, the marks for practicals, industrial visit reports, and the Team Design Project are all taken into account.

To achieve Honours in Part I it is necessary to obtain a minimum mark of 40% averaged over all elements of assessment for Part I, AND obtain a minimum mark of 40% in each of at least four of the six written papers sat in Trinity term, AND satisfy the coursework requirement as detailed in the Examination Regulations 2014. The Examination Conventions for MEM in 2013-14 are shown in Appendix O.

The Introductory Economics examination is taken normally in week 9 of the Trinity term of your second year.

Part II consists of one Materials Options paper, and one Economics or Management paper chosen from a selection of options. Each paper is of three hours duration. Marks are also awarded for the management project report. Table 9 shows the total number of marks allocated to different components of the examination.

**Table 9: Summary of marks to be awarded for different components of the MEM Final Examination in 2014, subject to confirmation by the examiners**

	<b>Component</b>	<b>Mark</b>
<b>Part I</b>	General Paper 1	100
	General Paper 2	100
	General Paper 3	100
	General Paper 4	100
	Introductory Economics (Ec1)	100
	Paper M1	100
	Microeconomics	100
	Practicals	50
	Industrial visits	20
	Team Design Project	50
<b>Part I Total</b>		<b>820</b>
<b>Part II</b>	Management Project	200
	Materials Options Paper 2	100
	One from the Economics or Management options	100
<b>Part II Total</b>		<b>400</b>
<b>Overall Total</b>		<b>1220</b>

You will be able to access your own results via the Student Self Service portal approximately 2-3 weeks after the end of Trinity Full Term (subject to change). The Academic and Assessment Results page within Self Service details all your assessment results (examination papers and/or submissions) and the result of the year (if applicable). You will need your Single Sign-on ID and password to access Student Self Service.

### **18.3 Calculators in Exams**

In Prelims, MS Part I, and the materials papers of MEM Parts I & II, the only types of calculators that may be used in examinations are from the following series:

CASIO fx-83

CASIO fx-85

SHARP EL-531

For MEM examinations in Economics and Management, the only restrictions on the use of calculators are those listed under 'Use of Calculators in Examinations' in the 2013 edition of Examination Regulations. In summary these state that: the calculator must not need a mains supply, must not cause a disturbance, output shall be by visible display only, no storage media external to the calculator are permitted, input shall be by its keys or switches only. Candidates are required to clear any user-entered data or programmes from memories immediately before the exam begins. The examiners may inspect any calculator during the course of an exam.

### **18.4 Examiners**

The examiners for Part I and Part II in the Final Honours Schools are appointed on an annual basis. In 2014-15, the Examiners in the Department of Materials are as follows:

#### **Examiners for the Part I / Part II Examination:**

Professor Simon Benjamin, Professor Chris Grovenor, Professor Angus Kirkland, Professor Jason Smith, Professor Angus Wilkinson (Chair) and Professor Peter Wilshaw. The external examiners are Professor Grace Burke, University of Manchester and Professor Mike Reece, Queen Mary University London.

In addition, for MEM Parts I and II, there will be examiners appointed from the Department of Economics and the School of Management.

It must be stressed that in order to preserve the independence of the examiners, you are not allowed to make contact directly about matters relating to the content of the exams or the marking of papers. Any communication must be via the Senior Tutor of your college, who will, if he or she deems the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chair of Examiners. If you have any queries about the Examinations or anything related to the Examinations, for example, illness, personal issues, please don't hesitate to seek further advice from your College tutor, or one of the Department's academic support staff.

### **18.5 Entry for University examinations and examination dates**

Instructions for entering for University examination and examination timetables can be found via [www.ox.ac.uk/current\\_students/examinations\\_assessments/index.html](http://www.ox.ac.uk/current_students/examinations_assessments/index.html).

## 18.6 Preparing for examinations

It is quite normal for students to feel anxious in the run-up to examinations. Developing a strategic approach can help you to take and maintain control of your preparation.

The Oxford University Student Union (OUSU) provides some helpful advice on their website at [www.ousu.org/acaff/study-skills/finals-forums-tips/?searchterm=exams](http://www.ousu.org/acaff/study-skills/finals-forums-tips/?searchterm=exams) and the Department provides you with a guidance pamphlet entitled “Preparing for Examinations” (see <http://www.materials.ox.ac.uk/uploads/file/preparingforexaminations2012-13.pdf>). See also [www.ox.ac.uk/students/shw/health/exams/](http://www.ox.ac.uk/students/shw/health/exams/) at the main student portal. Your College Tutor will be able to offer advice specifically suited to you based on their knowledge of your strengths and weaknesses. Past exam papers are available online through OXAM at <http://missun29.offices.ox.ac.uk/pls/oxam/main>.

## 18.7 Collections

Collections are examinations sat in Colleges during 0<sup>th</sup> week at the start of term. The Department of Materials uses centrally set Collections, so that all students in the same year sit the same paper. Collections questions are often drawn from past examination papers and the feedback from your tutor on this performance should help you to understand what is required for a first-class answer to an exam question. In your third year, there will be a double collection on the previous year’s work at the start of the Michaelmas Term. This collection will be centrally set and marked.

## 19 Student Prizes

The Department has a large number and variety of prizes available to students in all years of their degree.

**Johnson–Matthey Prize** for best overall performance in Prelims - **£1,000**

**Armourers and Brasiers’ Company / Rolls Royce prize** for outstanding overall performance in Prelims (awarded to the students with the 2nd and 3rd highest marks) - total prize **£400**

**Armourers’ and Brasiers’ Company / TATA Steel Prize** for the best overall performance in Prelims practicals - **£500**

**TATA Steel Prize** for best overall performance in Part I practicals (MS/MEM) - **£250**

**Armourers’ and Brasiers’ Company / TATA Steel Prize** for the best Team Design Project - **£1,000**

**Gibbs Prize** for best overall performance in MS/MEM Part I - **£190**

**Worshipful Company of Ironmongers Prize** for best MS Part II presentation - **£400 and a medal**

**Armourers’ and Brasiers’ Prize and Armourers’ Medal** for the best MS Part II project - **£250 and a medal**



**Institute of Materials, Minerals and Mining Prize** for best overall performance in Parts I and II (MS or MEM) - **£100**

**Pilkington Prize** for best project of any kind (EEM/MEM candidates eligible) - **£200**

**Department of Materials' Annual Prize** for the most significant improvement between Part I and Part II - **£100**

In addition, each year we have an opportunity to nominate a Part II student for the **National Science, Engineering & Technology Award in Materials** (see [www.setawards.org](http://www.setawards.org)). Once the finals results are known, and if a student of sufficient merit is available, the Part II Examiners will nominate a candidate from Oxford Materials. However the rules of the national competition require that to be eligible candidates **MUST** be able to attend the final judging & award ceremony in London, normally held towards the end of September in the year of the Part II examination. Entries are submitted electronically by a student's supervisor and require a 2000 word synopsis of the project from the student, and a 500 word citation from the supervisor; this must be submitted by a deadline that is normally close to the end of July. Because of the tight timeframe between the release of the results and the closing date, we suggest that you check that both you and your supervisor will be able to complete the necessary documents, should you be nominated.

## **20 Careers and Vacation jobs**

The careers taken up by our graduates are of almost bewildering variety! Three broad groupings can be identified: approximately one third go directly into scientific or technology-related employment in industry; another third go on to some form of further postgraduate education or training either in the UK or abroad; and the final third pursue careers which have no immediate relevance to their Oxford studies (although a number of people in this last group discover that their knowledge of materials science is useful, e.g. in technical finance and investment, patent law, and accountancy in industry).

It is a very good idea to work in industry during one or more long vacations, and if possible to obtain industrial sponsorship whilst at University. Employers are becoming increasingly distrustful of the traditional 'milk round' interview approach to recruitment, and are correspondingly more likely to recruit from the ranks of those who have already spent time working for their organisations. The ability to work in a team, to communicate well, to show initiative, and to get a task completed well and on time, are all qualities vital to the employer, and can best be assessed on the basis of experience, rather than under the artificial conditions of an interview.

Advice about vacation placements and jobs for graduates can be obtained from a variety of sources. The University Careers Service (56 Banbury Road, [www.careers.ox.ac.uk/](http://www.careers.ox.ac.uk/)) has outstanding resources, and provides an excellent service. Dr Adrian Taylor gives a briefing early in

Hilary Term for all students who are interested in vacation placements. Normally, several opportunities are available overseas, including China and the USA.

There is also a notice board, just outside the Library in the Hume-Rothery Building, which is used to display current information about job opportunities and vacation attachments. Tutors should also be consulted. They receive a lot of information from potential employers, and may also be in touch with previous graduates who are working in industry. Many of them also have direct links with particular industrial companies, and a personal recommendation always helps!

The [Oxford University Careers Service](#) has a number of programmes and workshops that provide opportunities to develop skills and experience for your career. There is also a Skills Hub available via WebLearn at <https://weblearn.ox.ac.uk/portal/hierarchy/skills> .

In Michaelmas of your final year you will be invited to meet informally with several alumni of the Department to enable you to seek advice and inspiration on careers available to Materials graduates.

### **Graduate Entrepreneur Visa Endorsement**

International students may be interested to know of the Tier 1 (Graduate Entrepreneur) category for the UKBA points based system, under which Oxford University may endorse a small number of graduates who have 'genuine and credible business ideas and entrepreneurial skills, to extend their stay in the UK after graduation to establish one or more businesses in the UK'.

Further details about this are available through Career Connect - visit <http://www.careers.ox.ac.uk/our-services/careerconnect/> to register. For information on the Tier 1 (Graduate Entrepreneur) visa and eligibility please visit the UKBA website: <http://www.ukba.homeoffice.gov.uk/visas-immigration/working/tier1/graduate-entrepreneur/>.

## **21 Intellectual Property Rights**

Appendix P outlines the University policy on Intellectual Property Rights (IPR).

## 22 If you need help

### 22.1 Asking for assistance

This section could be sub-titled 'What to do if things go wrong'. The first thing to recognise is that it is not unusual for students to experience a difficulty of one kind or another. Some aspect of the course might be horribly difficult to understand; a personal relationship might break down; a health problem might arise; or domestic or financial difficulties might crop up. Such difficulties may give rise to feelings of inadequacy, compounded by the impression that everyone else is coping better. What is the best way to deal with such difficulties? There are perhaps three main aspects to this:

As far as possible, **be prepared**. Expect the unexpected. From the start of the first term of the first year, work systematically and regularly on your studies, and don't rely on 'last minute panics' to get you out of difficulties. Take the time and effort to cultivate good friends, to whom you will be able to turn in times of trouble. And don't forget the basics of regular meals, some form of physical exercise, and enough sleep. In engineering terms, this amounts to building a margin of safety into your design for living, so that when extra stress is applied at some point, the whole structure does not immediately collapse in a heap!

**Be positive**. Try to remind yourself that you are not the only person in this position. Learning to cope, and learning how and where to seek help when you need it, is part of the natural preparation for your future, and part of your progress towards personal maturity.

**Be proactive** in seeking help. Go and talk to somebody. It is very common to feel that nobody can help you with your particular insurmountable difficulty. In fact, the opposite is the case, and there are a lot of people ready to assist you. Usually the best advice (but sometime a difficult step to take) is to go and talk to your Tutor.

If you feel that you cannot do that, then at college level, you can go to your College Adviser (if one has been appointed), or to a College Counsellor, or one of your College Officers with particular responsibility for looking after students e.g. the College Doctor, Dean, Chaplain, Senior Tutor or Head of House.

At the Departmental level, you can consult any member of staff, and in particular, the Director of Studies, Dr Adrian Taylor; Deputy Administrator (Academic), Ms Philippa Moss; the Head of Department, Professor Chris Grovenor; one of the Harassment Advisers (Professor Jan Czernuszka, Mrs Paula Topping and Mr Laurie Walton), or the Administrator, Mrs Alana Davies. Or you might find it easier to talk to an older student or a postgraduate in your college, who may have experienced similar problems. Your JCR should also have a Welfare Representative who may be able to help.

Further details about support available through the University may be found at <http://www.ox.ac.uk/students/shw/>. In addition, there are several organisations that exist to help you, including:

- The University Counselling Service, 3 Worcester Street (appointments may be made by telephoning 70300 from within the university or 270300 from outside, or by email: [counselling@admin.ox.ac.uk](mailto:counselling@admin.ox.ac.uk)).
- Nightline - a student-run counselling service (<http://users.ox.ac.uk/~nightln/>, Oxford 270270, 16 Wellington Square, term time, 8 p.m. to 8 a.m.).
- Student Advice Service, a confidential service offered by the Oxford University Student Union. For further details, refer to the OUSU website [at http://ousu.org/advice/student-advice-service/](http://ousu.org/advice/student-advice-service/).
- Oxford Student Alcohol and Drugs Advice: this is a counselling service coordinated by the Student Advice Service (same details as above).
- The Samaritans (0845 790 9090 or Oxford 722122, 24 hours), who can provide counselling, as well as an emergency service for the suicidal and despairing.
- The Libra Project (Oxford 723500) has been set up by a voluntary organisation to provide free counselling and advice for anyone worried about their drinking, or any drugs they may be taking.
- University Harassment Line (70760 from within the university or 270760 from outside, email: [harassment.line@admin.ox.ac.uk](mailto:harassment.line@admin.ox.ac.uk)).
- University Equality and Diversity Unit (89830 from within the university or 289830 from outside; [www.admin.ox.ac.uk/eop/](http://www.admin.ox.ac.uk/eop/) ).

## 22.2 Special Needs

Specialist advice and assistance is available for dyslexic, blind/partially sighted, and other disabled students from the University Disability Office ([www.ox.ac.uk/students/shw/das/](http://www.ox.ac.uk/students/shw/das/) or [disability@admin.ox.ac.uk](mailto:disability@admin.ox.ac.uk) or 01865 (2)80459).

If you experience difficulties with your course because of a disability then you should discuss this with your college tutors. Some colleges have a specific member of staff who assists students with welfare difficulties.

## 22.3 The University's Complaints and Appeals Procedures

The University has procedures for students should they believe a formal complaint or appeal is required. The details below outline the procedures for this within the Department of Materials. Before embarking on any formal procedure, you are advised to approach a relevant senior figure with your doubts and discuss it informally as soon as you think there is a problem.

## Complaints and academic appeals within the Department of Materials

1. The University, the Mathematical, Physical and Life Sciences Division and the Materials Department all hope that provision made for students at all stages of their programme of study will make the need for complaints (about that provision) or appeals (against the outcomes of any form of assessment) infrequent.
2. However, all those concerned believe that it is important for students to be clear about how to raise a concern or make a complaint, and how to appeal against the outcome of assessment. The following guidance attempts to provide such information.
3. Nothing in this guidance precludes an informal discussion with the person immediately responsible for the issue that you wish to complain about (and who may not be one of the individuals identified below). This is often the simplest way to achieve a satisfactory resolution.
4. Many sources of advice are available within colleges, within faculties/departments and from bodies like OUSU or the Counselling Service, which have extensive experience in advising students. You may wish to take advice from one of these sources before pursuing your complaint.
5. General areas of concern about provision affecting students as a whole should, of course, continue to be raised through Joint Consultative Committees or via student representation on the department's committees.

### Complaints

1. If your concern or complaint relates to teaching or other provision **made by the faculty/department**, then you should raise it with the Director of Studies (Dr Adrian Taylor) as appropriate. Within the department the officer concerned will attempt to resolve your concern/complaint informally.
2. If you are dissatisfied with the outcome, then you may take your concern further by making a formal complaint to the University Proctors. A complaint may cover aspects of teaching and learning (e.g. teaching facilities, supervision arrangements, etc.), and non-academic issues (e.g. support services, library services, university accommodation, university clubs and societies, etc.).

A complaint to the Proctors should be made only if attempts at informal resolution have been unsuccessful. The procedures adopted by the Proctors for the consideration of complaints and appeals are described in the Proctors and Assessor's Memorandum

[\[www.admin.ox.ac.uk/proctors/info/pam/\]](http://www.admin.ox.ac.uk/proctors/info/pam/) and the relevant Council regulations

[\[www.admin.ox.ac.uk/statutes/regulations/\]](http://www.admin.ox.ac.uk/statutes/regulations/)

3. If your concern or complaint relates to teaching or other provision **made by your college**, then you should raise it either with your tutor or with one of the college officers, Senior Tutor, Tutor for Graduates (as appropriate). Your college will also be able to explain how to take your complaint further if you are dissatisfied with the outcome of its consideration.

### **Academic appeals**

4. An appeal is defined as a formal questioning of a decision on an academic matter made by the responsible academic body.
5. For undergraduate or taught graduate courses, a concern which might lead to an appeal should be raised with your college authorities and the individual responsible for overseeing your work. It must not be raised directly with examiners or assessors. If it is not possible to clear up your concern in this way, you may put your concern in writing and submit it to the Proctors via the Senior Tutor of your college.  
As noted above, the procedures adopted by the Proctors in relation to complaints and appeals are on the web [[www.admin.ox.ac.uk/statutes/regulations/](http://www.admin.ox.ac.uk/statutes/regulations/)].
6. For the examination of research degrees, or in relation to transfer or confirmation of status, your concern should be raised initially with the Director of Graduate Studies. Where a concern is not satisfactorily settled by that means, then you, your supervisor, or your college authority may put your appeal directly to the Proctors.
7. Please remember in connection with all the cases in paragraphs 5 - 7 that:
  - (a) The Proctors are not empowered to challenge the academic judgement of examiners or academic bodies.
  - (b) The Proctors can consider whether the procedures for reaching an academic decision were properly followed; i.e. whether there was a significant procedural administrative error; whether there is evidence of bias or inadequate assessment; whether the examiners failed to take into account special factors affecting a candidate's performance.
  - (c) On no account should you contact your examiners or assessors directly.
8. The Proctors will indicate what further action you can take if you are dissatisfied with the outcome of a complaint or appeal considered by them.

## Appendix A Plagiarism

This information can be applied to all aspects of assessment during the course.

In their **Essential Information for Students**, the University's Proctors and Assessor draw attention to two extremely important disciplinary regulations for all students.

**3 No candidate shall cheat or act dishonestly, or attempt to do so, in any way, whether before, during or after an examination, so as to obtain or seek to obtain an unfair advantage in an examination.**

**4 No candidate shall present for an examination as his or her own work any part or the substance of any part of another person's work.**

**5 In any written work (whether thesis, dissertation, essay, coursework, or written examinations) passages quoted or closely paraphrased from another person's work must be identified as quotations or paraphrases, and the source of the quoted or paraphrased material must be clearly acknowledged.**

All undergraduate and graduate students must carefully read regulations 3, 4 and 5 in the Proctors' Disciplinary Regulations for University Examinations below. These make it clear that you must always indicate to the examiners when you have drawn on the work of others; other people's original ideas and methods should be clearly distinguished from your own, and other people's words, illustrations, diagrams etc. should be clearly indicated regardless of whether they are copied exactly, paraphrased, or adapted. Failure to acknowledge your sources by clear citation and referencing constitutes plagiarism. The University reserves the right to use software applications to screen any individual's submitted work for matches either to published sources or to other submitted work. Any matches might indicate either plagiarism or collusion. Although the use of electronic resources by students in their academic work is encouraged, you should remember that the regulations on plagiarism apply to on-line material and other digital material just as much as to printed material.

...Where plagiarism is proven, it will be dealt with severely: in the most extreme cases, this can result in the student's career at Oxford being ended by expulsion from the University."

(The Proctors' and Assessor's Memorandum, Section 9.5

[www.admin.ox.ac.uk/proctors/pam/index.shtml](http://www.admin.ox.ac.uk/proctors/pam/index.shtml))

The University definition of plagiarism is:

Plagiarism is the copying or paraphrasing of other people's work or ideas into your own work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition.

Collusion is another form of plagiarism involving the unauthorised collaboration of students (or others) in a piece of work.

Cases of suspected plagiarism in assessed work are investigated under the disciplinary regulations concerning conduct in examiners. Intentional or reckless plagiarism may incur severe penalties, including failure of your degree or expulsion from the university.

### **Some Brief Guidance**

#### **Text**

Take care when referring to the work of others. Not only are published words subject to plagiarism, but ideas and opinions can be plagiarised too. You should not allow the opinions and conclusions of others to appear to be your own or confused with your own criticism.

An extract from Stone IC & Tsakirooulos P, *Materials Science and Engineering A*, Vol.189 (1994) 285-290:

“The peak-aging time of Al-4wt.%Cu, aged at 463 K, was not altered by the addition of 20 wt.%SiCp. The particle size of the reinforcement and the matrix to reinforcement particle-size ratio did not affect the peak-aging time. This implies that, on a bulk scale, aging is not affected by the spatial distribution of the reinforcement, although it is likely to be affected locally.”

Here is one example of the use of this extract:

Stone and Tsakirooulos studied the aging of metal matrix composites based on Al-4wt.%Cu containing 20wt% SiC particles [Stone & Tsakirooulos, 1994]. The peak-aging time of Al-4wt.%Cu, aged at 463 K, was not altered by the addition of 20 wt.%SiCp. The particle size of the reinforcement and the matrix to reinforcement particle-size ratio did not affect the peak-aging time. This implies that, on a bulk scale, aging is not affected by the spatial distribution of the reinforcement, although it is likely to be affected locally.



The first sentence is fine and is properly referenced. However, the rest is plagiarised because (i) it is **directly copied** from the original without being identified as a quote and (ii) the author has not attributed the opinion in the fourth sentence to the original authors.

A second example:

Stone and Tsakirooulos studied the aging of metal matrix composites based on Al-4wt%Cu containing 20wt% SiC particles [Stone & Tsakirooulos, 1994]. They showed that the addition of the reinforcing particles had no effect on the time for peak aging of the matrix at 463K. The implication of this is that whilst aging is likely to be affected locally by the dispersion of the particles, it is not affected macroscopically by the spatial distribution of the reinforcement.

This example is an improvement because the second sentence is now attributed to the original authors. The opinion in the final sentence is still plagiarised. This final sentence could be improved by

The authors concluded that the implication of this is that whilst aging is likely to be affected locally by the dispersion of the particles, it is not affected macroscopically by the spatial distribution of the reinforcement. This is a sensible conclusion.

because whilst the new author agrees with the original opinion/conclusion they have not passed it off as their own. A belt and braces approach might be:

The authors concluded, "This implies that, on a bulk scale, aging is not affected by the spatial distribution of the reinforcement, although it is likely to be affected locally" [Stone & Tsakirooulos, 1994]. This is a sensible conclusion.

Quite often you will not be simply referring to a single piece of published work, but comparing & contrasting several reports of relevance to a particular point in your own document and then offering your own considered opinion on this previous work and/or comparing it with your own data and conclusions.

The principles illustrated above in respect of Stone & Tsakirooulos of course still apply to this more complicated case and in addition it is necessary to separately identify each contribution, for example:

It has been reported by two groups that the time for peak aging of the matrix at aging temperatures in the range 460-475K is not affected by the addition of reinforcing particles [Stone & Tsakirooulos (1994), Bloggs & Jones (1997)]. Although a more recent study did observe an apparent influence of the reinforcing particles [Smith (2006)], in the present work we have been unable to reproduce this effect, our data being fully consistent with the original work of Stone & Tsakirooulos. It seems likely that the results reported by Smith were an artefact of the analytical method that they adopted, such artefacts having been observed by others in related studies of a series of Al-Cu-Mg alloys [Jones et al (1999)].

## **Figures**

Figures too are a potential source of plagiarism. If you use somebody else's diagram, graph, photograph or other artwork without acknowledging the original source then you are guilty of plagiarism (and possibly also of breach of copyright). If you use a figure from elsewhere then you should cite the original reference in the figure caption and in the associated body text. Even if you redraw a figure then you should still refer to the original source, e.g. [redrawn from Jones et al, 2006]. If you use a collection of data from other works to create a completely new figure (e.g. a graph to show a trend arising from a collection of data from several sources) then you must acknowledge the original data sources.

## **Why is referencing important?**

Quite apart from the need to avoid plagiarism because of the danger that this may invalidate a piece of assessed work and/or lead to some other penalty, there are a number of other good reasons for the internationally accepted practise of using references in a factual document:

- (i) It is a simple professional courtesy to a fellow scientist who has laboured long & hard to generate the work that you are referring to.
- (ii) It enables the reader to verify the statements that you are making, to make his/her own judgements on both the conclusions that you report from the referenced work and the judgements that you make on this work, and of course to learn more about the detail of the original work.
- (iii) Your work is strengthened by its reference to respected authorities in a given field; as scientists we all build our work 'on the shoulders of giants'.

- (iv) It enables the reader to identify very clearly what are your own original contributions to the matters discussed. Since these contributions will undoubtedly be erudite and valuable, you will want the world to know that they are yours and to be able to give you credit for them when your work is referenced in the future!

The two main referencing systems are Harvard (author name, year of publication) and Vancouver (numbered sequentially in order of use). Whichever system you decide to use, good practice dictates that references should include (depending on publication type): authors, title of book or article, title of journal or other work, name of conference, place of publication, date of publication, publisher and page numbers. The conventions for citing internet resources include URL and date accessed. A useful style guide can be found at <http://authorservices.wiley.com>. Your tutor will be able to provide further guidance.

**Other useful information on plagiarism** can be found on the Education Committee (EdC) web pages at <http://www.ox.ac.uk/students/academic/goodpractice/>

## Appendix B Y2 Language Option

To:	Director of Studies
Name:	
College:	

I wish to take the Foreign Language Option this year, instead of the Entrepreneurship & New Ventures course.

Language	Level	Online Test score	Previous Qualification in the Language		
			GCSE Grade	AS/A Level Grade	Other qualification

Yes – I studied this language in my first year through an OPAL course with the Language Centre. Please state level of course: .....

No – I did not take an OPAL course with the Language Centre in my first year

I confirm that I have registered with the Language Centre for entry to the above course **and** received confirmation of a place on the above course. (Note registration deadline is Wednesday of week 1)

I can confirm that the College is agreeable to the above transfer:

Signature of Tutor: ..... Date: .....

Signature of student: ..... Date: .....

This form must be returned to the Deputy Administrator (Academic) by the end of **week 4, Michaelmas Term**

Y2 Supplementary Subject

To:	Director of Studies
Name:	
College:	

I wish to take the following Supplementary Subject this year, instead of the Entrepreneurship & New Ventures course.

**Supplementary Subject:**

I can confirm that the College is agreeable to the above:

Signature of Tutor: ..... Date: .....

Signature of student: ..... Date: .....

This form must be returned to the Deputy Administrator (Academic) by the end of **week 4, Michaelmas Term**

## **Appendix C Business Plan Assessment**

**The following marking scheme and assessment criteria were used in 2011-12:**

### **Marking scheme and Assessment criteria**

The business plan should include the following sections. There is flexibility in their order, as this may vary according to the actual product. The content of each section has been suggested as a guide. The marking scheme used here reflects the learning objectives of this assessment and is in no way indicative of the appropriate balance for a real business plan, where the market analysis, finance and management sections would be significantly more important. The use of appendices is recommended.

#### **Summary 5%**

The main aim of the summary is to get the reader's attention and to encourage them to continue to read the business plan. It should include a statement of how much funding is being sought and how much of the company is being offered in exchange.

**This section must demonstrate that you have a clear understanding of the key fundamentals of your business.**

#### **The Product 10%**

What is it that you are trying to sell and why should anyone buy it? What are your product's key competitive benefits?

**This section must demonstrate an understanding of your product and the key principals of selling benefits not features.**

#### **The Market 5%**

Who will buy your product and why? How many people will want your product? Are there any other products that are similar?

**This section must demonstrate your ability to make sensible judgments using the resources available to you.**

### **The Technology 15%**

This section must include a clear description of the technology behind your product. How does it work? What is your IP strategy? Include relevant detail for your audience. What is it about your technology that is particularly clever or innovative?

**This section must demonstrate your ability to communicate complex ideas in an appropriate manner with an understanding of the benefits and weaknesses of IP protection.**

### **Business Strategy 15%**

What sort of business are you? How will you sell your product? How will you supply your customers? What is your pricing strategy?

**You must clearly demonstrate you have considered how best to arrive at a price for your product and describe an appropriate supply chain.**

### **Commercialisation Issues 20%**

It works in the lab, what makes you think it will work in a factory? What mechanisms can you use to help? What could go wrong?

**This section must identify the factors that need to be managed for successful scale up and customer supply, including a clear identification of the possible areas of risk.**

### **Risk assessment 20%**

What poses a significant risk to the success of your business and what is your strategy to protect yourself?

**This section must demonstrate that you have understood the circumstances that could cause your business to fail and what mechanisms can be used for protection.**

### **Finance 10%**

This section should include an analysis of your costs for year 1, your revenue for year 1, details of investments so far, what investment is being sort and what is being offered in return, i.e. equity or loan etc. What is your exit strategy for investors?

Normally this section would include details of projected sales figures, estimated cost of sales, profit and loss predictions and examples of cash flows. You do not have to do this.

**This section must present well reasoned figures.**

## Appendix D Business Plan Declaration of Authorship form



### FINAL HONOUR SCHOOL OF MATERIALS SCIENCE DECLARATION OF AUTHORSHIP

Candidates for the Engineering and Society coursework should complete this declaration. All candidates in the group should sign this declaration and enclose in a separate envelope to be submitted with the Business Plan.

<b>Names / Colleges (in capitals):</b>	<b>Candidate numbers:</b>
(1)	(1)
(2)	(2)
(3)	(3)
(4)	(4)
(5)	(5)
(6)	(6)
<b>Business Plan Tutor:</b>	
<b>Title of Business Plan (in capitals):</b>	

**Word count:** \_\_\_\_\_

There is extensive information and guidance on academic good practice and plagiarism in the course handbook and on the University website:

<http://www.ox.ac.uk/students/academic/goodpractice/>

**Please tick to confirm the following:**

We have read and understood the University's disciplinary regulations concerning conduct in examinations and, in particular, of the regulations on plagiarism (Essential Information for Students. The Proctors' and Assessor's Memorandum, Section 9.6; also available at <http://www.admin.ox.ac.uk/proctors/info/pam/section9/>).

We have read and understood the Education Committee's information and guidance on academic good practice and plagiarism at <http://www.ox.ac.uk/students/academic/goodpractice/>.

The project we are submitting is entirely our own work except where otherwise indicated.

It has not been submitted, either partially or in full, for another Honour School or qualification of this University (except where the Special Regulations for the subject permit this), or for a qualification at any other institution.

We have clearly indicated the presence of all material we have quoted from other sources, including any diagrams, charts, tables or graphs.

We have clearly indicated the presence of all paraphrased material with appropriate references.

We have acknowledged appropriately any assistance we have received in addition to that provided by our supervisor(s).

We have not copied from the work of any other candidate.

We have not used the services of any agency providing specimen, model or ghostwritten work in the preparation of this project. (See also section 2.4 of Statute XI on University Discipline under which members of the University are prohibited from providing material of this nature for candidates in examinations at this University or elsewhere: <http://www.admin.ox.ac.uk/statutes/352-051a.shtml>)



We agree to retain an electronic copy of this work until the publication of our final examination results, except where submission in hand-written format is permitted.

We agree to make any such electronic copy available to the examiners should it be necessary to confirm the word count or to check for plagiarism.

Candidates' signatures:

Date:

(1) .....	.....
(2) .....	.....
(3) .....	.....
(4) .....	.....
(5) .....	.....
(6) .....	.....

## Appendix E Team Design Project Assessment

### Department of Materials Part I 2012-13 - Team Design Projects

#### Agreed Mark Sheet

Title:

Name of Assessors:

	Comments	Written report	Verbal Presentation	Total
Objectives		/10	/5	
Achievements		/30	/15	
Conclusions		/10	/5	
Clarity Timing		N/A	/10	
Teamwork		/15		<b>/100</b>

Project mark out of 50

**/50**

Student Name	Suggested Mark up or down	Individual mark

Signature

Date

## Appendix F Team Design Project Declaration of Authorship form



FINAL HONOUR SCHOOL OF MATERIALS SCIENCE AND FINAL HONOUR SCHOOL OF MATERIALS,  
ECONOMICS AND MANAGEMENT

### DECLARATION OF AUTHORSHIP

Candidates for the Team Design Project should complete this declaration. All candidates in the group should sign this declaration and enclose in a separate envelope to be submitted with the Team Design Projects.

<b>Names / Colleges (in capitals):</b>	<b>Candidate numbers:</b>
(1)	(1)
(2)	(2)
(3)	(3)
(4)	(4)
(5)	(5)
(6)	(6)
(7)	(7)
<b>Supervisor(s):</b>	
<b>Title of Team Design Project (in capitals):</b>	

**Word count:** \_\_\_\_\_

There is extensive information and guidance on academic good practice and plagiarism in the course handbook and on the University website:

<http://www.ox.ac.uk/students/academic/goodpractice/>

**Please tick to confirm the following:**

We have read and understood the University's disciplinary regulations concerning conduct in examinations and, in particular, of the regulations on plagiarism (Essential Information for Students. The Proctors' and Assessor's Memorandum, Section 9.6; also available at <http://www.admin.ox.ac.uk/proctors/info/pam/section9/>).

We have read and understood the Education Committee's information and guidance on academic good practice and plagiarism at <http://www.ox.ac.uk/students/academic/goodpractice/> .

The project we are submitting is entirely our own work except where otherwise indicated.

It has not been submitted, either partially or in full, for another Honour School or qualification of this University (except where the Special Regulations for the subject permit this), or for a qualification at any other institution.

We have clearly indicated the presence of all material we have quoted from other sources, including any diagrams, charts, tables or graphs.

We have clearly indicated the presence of all paraphrased material with appropriate references.

We have acknowledged appropriately any assistance we have received in addition to that provided by our supervisor(s).

We have not copied from the work of any other candidate.

We have clearly identified who in the group is the primary author of each section of the report.

We have not used the services of any agency providing specimen, model or ghostwritten work in the preparation of this project. (See also section 2.4 of Statute XI on University Discipline under which members of the University are prohibited from providing material of this nature for candidates in examinations at this University or elsewhere: <http://www.admin.ox.ac.uk/statutes/352-051a.shtml>)

We agree to retain an electronic copy of this work until the publication of our final examination results, except where submission in hand-written format is permitted.

We agree to make any such electronic copy available to the examiners should it be necessary to confirm the word count or to check for plagiarism.

Candidates' signatures:

Date:

(1) .....	.....
(2) .....	.....
(3) .....	.....
(4) .....	.....
(5) .....	.....
(6) .....	.....
(7) .....	.....

## Appendix G      **Advanced Characterisation of Materials Assessment**

### **Means of Assessment:**

Assessed individually by the marking of a project report of between 2000 and 3000 words long (including figure captions but excluding references).

The reports are to be submitted by noon on Tuesday of week 3 of Michaelmas Term to the Assistant to the Deputy Administrator (Academic).

### **Project Report:**

The report will comprise:

- An **introduction** encompassing a brief description of the sample, and the rationale for using the characterisation techniques that were chosen. [8]
  - A **methods** section where the experimental techniques and sample preparation are described. [4]
  - A **results** section where the experimental data is presented. [13]
  - A **discussion** section where the results are interpreted. [13]
  - A **future work** section, which could include elements of the project that were not fully completed and a description of the possible benefits of using other characterisation techniques that were not used or not available. [7]
  - A brief **summary and conclusion**. [5]
- Total [50]

## Appendix H Introduction to Modelling for Materials Assessment

### Means of Assessment:

Assessed individually by the marking of two project reports each between 1000 and 1500 words long, subject to completing satisfactorily the first-week work sheets.

The reports are to be submitted by noon on Tuesday of week 3 of Michaelmas Term to the Assistant to the Deputy Administrator (Academic).

### Project Reports:

Each of the two reports will comprise:

- An **introduction** encompassing a brief description of the modelling method, its underlying theory and how it is implemented on a computer. [6]
  - A **results** section where the modelling data is presented. [7]
  - A **discussion** section where the results are interpreted. [7]
  - A brief **outlook** section on how the project could be embedded in a broader multiscale modelling approach. [2]
  - A brief **summary and conclusion**. [3]
- Total [25]

# Appendix I Options Module Declaration of Authorship form



## FINAL HONOUR SCHOOL OF MATERIALS SCIENCE

### DECLARATION OF AUTHORSHIP

Candidates for the Introduction to Modelling module or Characterisation of Materials module should complete this declaration. The candidate should sign this declaration and enclose in a separate envelope to be submitted with the module coursework.

**Name (in capitals):**

**Candidate number:**

**Module:**

**College:**

**Title of submission (in capitals):**

**Word count:**

There is extensive information and guidance on academic good practice and plagiarism in the course handbook and on the University website: [www.admin.ox.ac.uk/edc/goodpractice/](http://www.admin.ox.ac.uk/edc/goodpractice/)

**Please tick to confirm the following:**

I am aware of the University's disciplinary regulations concerning conduct in examinations and, in particular, of the regulations on plagiarism (c.f. The Proctors' and Assessor's Memorandum, Section 9.5 at [www.admin.ox.ac.uk/proctors/info/pam/section9/](http://www.admin.ox.ac.uk/proctors/info/pam/section9/).

The coursework I am submitting is entirely my own work except where otherwise indicated.

It has not been submitted, either wholly or substantially, for another Honour School or degree of this University, or for a degree at any other institution.

I have clearly signalled the presence of quoted or paraphrased material and referenced all sources.

I have acknowledged appropriately any assistance I have received in addition to that provided by the module demonstrators.

I have not sought assistance from any professional agency.

I agree to retain an electronic copy of this work until the publication of my final examination result, except where submission in hand-written format is permitted. I agree to make any such electronic copy available to the examiners should it be necessary to confirm my word count or to check for plagiarism.

Candidate's signature: ..... Date: .....

## **Appendix J      Industrial Visit Assessment**

### **Means of Assessment:**

Each visit is assessed individually by the marking of a word-processed report, each of about 1 A4 page, with supporting diagrams if appropriate (two pages is too much).

The reports are to be submitted between 11am and 1pm on the Friday of the week following the visit to the Assistant to the Deputy Administrator (Academic).

### **Project Reports:**

Each report should include:

- Several relevant technical or business/financially related insights learned on tour, highlighting materials-related issues or design considerations if possible.
- Presentation of information in coherent manner.
- Proper use of citations / sources used in the main text, including for images, and in the list of references.

Each report is marked by the Industrial Visits Academic Organiser and graded

- Good (5 marks)
- Satisfactory (2 marks)
- Non-satisfactory (0 marks)

Formative feedback will be given on your first report.



## Appendix K Part II Thesis Declaration of Authorship form



### FINAL HONOUR SCHOOL OF MATERIALS SCIENCE DECLARATION OF AUTHORSHIP

Candidates for the Part II examination of the Final Honour School of Materials Science should complete this declaration. A freshly signed declaration should be bound, immediately after the title page, into each copy of the thesis submitted for examination.

**Name (in capitals):**

**Candidate number:**

**Supervisor(s):**

**College:**

**Title of Part II thesis (in capitals):**

**Word count (main report):** \_\_\_\_

**Word count (project management):** \_\_\_\_

There is extensive information and guidance on academic good practice and plagiarism in the course handbook and on the University website: [www.ox.ac.uk/students/academic/goodpractice/](http://www.ox.ac.uk/students/academic/goodpractice/)

**Please tick to confirm the following:**

I have read and understood the University's disciplinary regulations concerning conduct in examinations and, in particular, of the regulations on plagiarism (Essential Information for Students. The Proctors' and Assessor's Memorandum, Section 9.6; also available at <http://www.admin.ox.ac.uk/proctors/info/pam/section9/>).

I have read and understood the Education Committee's information and guidance on academic good practice and plagiarism at [www.ox.ac.uk/students/academic/goodpractice/](http://www.ox.ac.uk/students/academic/goodpractice/).

The thesis I am submitting is entirely my own work except where otherwise indicated.

It has not been submitted, either partially or in full, for another Honour School or qualification of this University (except where the Special Regulations for the subject permit this), or for a qualification at any other institution.

I have clearly indicated the presence of all material I have quoted from other sources, including any diagrams, charts, tables or graphs.

I have clearly indicated the presence of all paraphrased material with appropriate references.

I have acknowledged appropriately any assistance I have received in addition to that provided by my supervisor.

I have not copied from the work of any other candidate.

I have not used the services of any agency providing specimen, model or ghostwritten work in the preparation of this thesis. (See also section 2.4 of Statute XI on University Discipline under which members of the University are prohibited from providing material of this nature for candidates in examinations at this University or elsewhere: <http://www.admin.ox.ac.uk/statutes/352-051a.shtml>).

I have not exceeded the page limit as defined in the Examination Regulations

I agree to retain an electronic copy of this work until the publication of my final examination result, except where submission in hand-written format is permitted.

I agree to make any such electronic copy available to the examiners should it be necessary to confirm my word count or to check for plagiarism.

**Candidate's signature:** ..... **Date:** .....

## Appendix L Learning Development

### Skills that the Materials degree programmes enable a proactive and fully-engaged student to develop

#### **Intellectual Skills for Materials Science:-**

Appreciation of the underlying principles of Materials Science, supported by an understanding of the necessary basic science required in studying this interdisciplinary subject.

An understanding of the processes and principles involved that lead to the appropriate application of materials, the importance of materials to industry and society as well as an awareness of sustainability, environmental issues and safety.

An understanding of engineering principles in order to understand the manufacturing methods and service performance of materials.

Ability to apply appropriate mathematical or numerical techniques to materials-based phenomena.

Ability to conduct a logical discussion and argue a coherent point of view.

Ability to solve a range of known problems and tackle unseen and more open-ended ones.

Ability to collate, analyse and interpret complex experimental data and infer conclusions where appropriate.

Ability to summarise scientific arguments and facts and to give succinct oral and written presentations, using IT-based methods where appropriate.

#### **Intellectual Skills for Materials, Economics & Management:-**

Appreciation of the underlying principles of Materials Science, supported by an understanding of the necessary basic science required studying this interdisciplinary subject.

An understanding of the processes and principles involved that lead to the appropriate application of materials, the importance of materials to industry and society.

An understanding of engineering principles in order to understand the manufacturing methods and service performance of materials.

A willingness and ability to challenge orthodoxy and deconstruct practitioners' accounts of business practice.

An understanding of commercial risk evaluation, supported by the ability to argue persuasively and to marshal evidence and analysis in a logical and coherent way.

Ability to apply appropriate mathematical or numerical techniques to materials-, business-, and economics-based phenomena.

Ability to solve a range of known problems and tackle unseen and more open-ended ones.

Ability to collate, analyse and interpret complex experimental data and infer conclusions where appropriate.

Ability to summarise arguments and facts and to give succinct oral and written presentations, using IT-based methods where appropriate.

**Practical Skills:**

Aware of the need for safety in practical laboratories, and the importance of good laboratory practice.

Ability to use a wide range of experimental techniques to make quantitative measurements, and to be able to draw scientifically rigorous conclusions from these observations.

Ability to plan, execute and write up projects.

Aware of the applications of practical Materials Science.

Knowledge of safe workshop practice and development of workshop skills.

Additionally, MEM students will be able to:

Listen attentively to complex presentations and identify the structure of the arguments presented and engage in positive but searching discussion with peers.

**Transferable Skills:**

Critical analysis and problem solving in a variety of contexts.

The ability to devise and apply the relevant numerical, mathematical or computational skills.

Project management skills, including time management and organisation in both a practical and non-practical context.

The ability and skills required to study effectively, for example for further research or professional qualifications.

Effective communication skills.

IT skills, especially those required for data processing and effective oral or written presentations and information retrieval.

The ability to work independently, with a strong sense of self-direction, and also constructively in co-operation with others.

And, additionally, for Material Science:

Entrepreneurship and business skills.

Foreign language ability (optional for those who wish to improve or take up a language).

And, additionally, for Materials, Economics and Management:

Experience of using bibliographic and statistical databases and internet search engines to find useful and appropriate data.

## **Appendix M      University Rules for Computer Use**

### **Regulations Relating to the use of Information Technology Facilities**

#### **Statutes and Regulations**

ICTC Regulations 1 of 2002

Made by the ICTC on 6 June 2002

Approved by Council on 24 July 2002

Amended on 2 October 2003, 23 October 2003, 16 February 2006, 1 June 2006, 3 June 2010 and  
19 July 2012

1. In these regulations, unless the context requires otherwise, 'college' means any college, society, or Permanent Private Hall or any other institution designated by Council by regulation as being permitted to present candidates for matriculation.
2. University IT and network facilities are provided for use in accordance with the following policy set by Council:
  - (1) The University provides computer facilities and access to its computer networks only for purposes directly connected with the work of the University and the colleges and with the normal academic activities of their members.
  - (2) Individuals have no right to use university facilities for any other purpose.
  - (3) The University reserves the right to exercise control over all activities employing its computer facilities, including examining the content of users' data, such as e-mail, where that is necessary:
    - (a) for the proper regulation of the University's facilities;
    - (b) in connection with properly authorised investigations in relation to breaches or alleged breaches of provisions in the University's statutes and regulations, including these regulations; or
    - (c) to meet legal requirements.
  - (4) Such action will be undertaken only in accordance with these regulations.
3. These regulations govern all use of university IT and network facilities, whether accessed by university property or otherwise.

4. Use is subject at all times to such monitoring as may be necessary for the proper management of the network, or as may be specifically authorised in accordance with these regulations.
5.
  - (1) Persons may make use of university facilities only with proper authorisation.
  - (2) 'Proper authorisation' in this context means prior authorisation by the appropriate officer, who shall be the Chief Information Officer or his or her nominated deputy in the case of services under the supervision of IT Services, or the nominated college or departmental officer in the case of services provided by a college or department.
  - (3) Any authorisation is subject to compliance with the University's statutes and regulations, including these regulations, and will be considered to be terminated by any breach or attempted breach of these regulations.
6.
  - (1) Authorisation will be specific to an individual.
  - (2) Any password, authorisation code, etc. given to a user will be for his or her use only, and must be kept secure and not disclosed to or used by any other person. Exceptions may be made for accounts set up specifically to carry out business functions of the University or a unit within it, but authorisation must be given by the head of the unit.
7. Users are not permitted to use university IT or network facilities for any of the following:
  - (1) any unlawful activity;
  - (2) the creation, transmission, storage, downloading, or display of any offensive, obscene, indecent, or menacing images, data, or other material, or any data capable of being resolved into such images or material, except in the case of the use of the facilities for properly supervised research purposes when that use is lawful and when the user has obtained prior written authority for the particular activity from the head of his or her department or the chairman of his or her faculty board (or, if the user is the head of a department or the chairman of a faculty board, from the head of his or her division);
  - (3) the creation, transmission, or display of material which is designed or likely to harass another person in breach of the University's Code of Practice on Harassment;
  - (4) the creation or transmission of defamatory material about any individual or organisation;
  - (5) the sending of any e-mail that does not correctly identify the sender of that e-mail or attempts to disguise the identity of the computer from which it was sent;

- (6) the sending of any message appearing to originate from another person, or otherwise attempting to impersonate another person;
- (7) the transmission, without proper authorisation, of e-mail to a large number of recipients, unless those recipients have indicated an interest in receiving such e-mail, or the sending or forwarding of e-mail which is intended to encourage the propagation of copies of itself;
- (8) the creation or transmission of or access to material in such a way as to infringe a copyright, moral right, trade mark, or other intellectual property right;
- (9) private profit, except to the extent authorised under the user's conditions of employment or other agreement with the University or a college; or commercial purposes (including advertising commercial services) without specific authorisation;
- (10) gaining or attempting to gain unauthorised access to any facility or service within or outside the University, or making any attempt to disrupt or impair such a service;
- (11) the deliberate or reckless undertaking of activities such as may result in any of the following:
  - (a) the waste of staff effort or network resources, including time on any system accessible via the university network;
  - (b) the corruption or disruption of other users' data;
  - (c) the unauthorised access, transmission or negligent loss of data;
  - (d) the violation of the privacy of other users;
  - (e) the disruption of the work of other users;
  - (f) the introduction or transmission of a virus or other malicious software into the network;
- (12) activities not directly connected with employment, study, or research in the University or the colleges (excluding reasonable and limited use for social and recreational purposes where not in breach of these regulations or otherwise forbidden) without proper authorisation.

8. Software and computer-readable datasets made available on the university network may be used only subject to the relevant licensing conditions, and, where applicable, to the Code of Conduct published by the Combined Higher Education Software Team ('CHEST').
9. Users shall treat as confidential any information which may become available to them through the use of such facilities and which is not clearly intended for unrestricted dissemination; such information shall not be copied, modified, disseminated, or used either in whole or in part without the permission of the person or body entitled to give it.
10.
  - (1) No user may use IT facilities to hold or process data relating to a living individual save in accordance with the provisions of current data protection legislation (which in most cases will require the prior consent of the individual or individuals whose data are to be processed).
  - (2) Any person wishing to use IT facilities for such processing is required to inform the University Data Protection Officer in advance and to comply with any guidance given concerning the manner in which the processing may be carried out.
11. Any person responsible for the administration of any university or college computer or network system, or otherwise having access to data on such a system, shall comply with the provisions of the 'Statement of IT Security and Privacy Policy'.
12. Users shall at all times endeavour to comply with policies and guidance issued from time to time by IT Services to assist with the management and efficient use of the University's IT facilities.
13. Connection of any computer, whether college, departmental, or privately owned, to the university network is subject to the following additional conditions:
  - (1)
    - (a) Computers connected to the university network may use only network identifiers which follow the University's naming convention, and are registered with IT Services.
    - (b) The University's Trade Mark and Domain Name Policy specifies, *inter alia*, that all university activities (other than those within OUP's remit) should be presented within the ox.ac.uk domain. Any exception to this requires authorisation as defined in that Policy.
  - (2)
    - (a) Owners and administrators of computers connected to the university network are responsible for ensuring their security against unauthorised access, participation in 'denial of service' attacks, etc. In particular they are responsible for ensuring that anti-virus software is installed and regularly updated, and that

rules and guidelines on security and anti-virus policy, as issued from time to time by IT Services, are followed.

- (b) The University may temporarily bar access to any computer or sub-network that appears to pose a danger to the security or integrity of any system or network, either within or outside Oxford, or which, through a security breach, may bring disrepute to the University.
- (3)
- (a) Providers of any service must take all reasonable steps to ensure that that service does not cause an excessive amount of traffic on the University's internal network or its external network links.
  - (b) The University may bar access at any time to computers which appear to cause unreasonable consumption of network resources.
- (4)
- (a) Hosting Web pages on computers connected to the university network is permitted subject to the knowledge and consent of the department or college responsible for the local resources, but providers of any such Web pages must endeavour to comply with guidelines published by IT Services or other relevant authorities.
  - (b) It is not permitted to offer commercial services through Web pages supported through the university network, or to provide 'home-page' facilities for any commercial organisation, except with the permission of the Chief Information Officer (IT Services); this permission may require the payment of a licence fee.
- (5) Use of file-sharing technology and participation in distributed file-sharing networks may be subject to additional regulation and restriction in order to prevent excessive use of university network resources, or the use of those resources for purposes unconnected with the University.

If a user has any reason to suppose that an application employs peer-to-peer (p2p) or other file-sharing technology, they should seek the advice of the IT officer responsible for the college or departmental network on which they propose to use the software.

- (6)
- (a) No computer connected to the university network may be used to give any person who is not a member or employee of the University or its colleges access to any network services outside the department or college where that computer is situated.



- (b) Certain exceptions may be made, for example, for members of other UK universities, official visitors to a department or college, or those paying a licence fee.
  - (c) Areas of doubt should be discussed with the Head of IT Services.
- (7) Providing external access to University network resources for use as part of any shared activity or project is permitted only if authorised by the IT Committee (ITC), and will be subject to any conditions that it may specify.
- (8) If any computer connected to the network or a sub-network does not comply with the requirements of this section, it may be disconnected immediately by the Network Administrator or any other member of staff duly authorised by the head of the college, section or department concerned.
14. (1) If a user is thought to be in breach of any of the University's statutes or regulations, including these regulations, he or she shall be reported to the appropriate officer who may recommend to the appropriate university or college authority that proceedings be instituted under either or both of university and college disciplinary procedures.
- (2) Access to facilities may be withdrawn under section 42 of Statute XI pending a determination, or may be made subject to such conditions as the Proctors or the Registrar (as the case may be) shall think proper in the circumstances.

### **Examining Users' Data**

15. All staff of an IT facility who are given privileged access to information available through that facility must respect the privacy and security of any information, not clearly intended for unrestricted dissemination, that becomes known to them by any means, deliberate or accidental.
16. (1) System Administrators (i.e. those responsible for the management, operation, or maintenance of computer systems) have the right to access users' files and examine network traffic, but only if necessary in pursuit of their role as System Administrators.
- (2) They must endeavour to avoid specifically examining the contents of users' files without proper authorisation.
17. (1) If it is necessary for a System Administrator to inspect the contents of a user's files, the procedure set out in paragraphs (2)-(5) below must be followed.

- (2) Normally, the user's permission should be sought.
- (3) Should such access be necessary without seeking the user's permission, it should, wherever possible, be approved by an appropriate authority prior to inspection.
- (4) If it has not been possible to obtain prior permission, any access should be reported to the user or to an appropriate authority as soon as possible.
- (5) For the purposes of these regulations 'appropriate authority' is defined as follows:
  - (a) in the case of any university-owned system, whether central or departmental: if the files belong to a student member, the Proctors; if the files belong to any member of the University other than a student member, the Registrar or his or her nominee; or, if the files belong to an employee who is not a member of the University, or a visitor to the University, the head of the department, college, or other unit to which the employee or visitor is responsible, or the head's delegated representative;
  - (b) in the case of a departmental system, either those named in (a) above, or, in all circumstances, the head of department or his or her delegated representative;
  - (c) in the case of a college system, the head of the college or his or her delegated representative.

## **Appendix N Examination Conventions: Materials Science 2013-14**

The Examination Conventions for 2013-14 are shown below. Note that the Conventions for 2014-15 will be based on those for 2013-14 but may not be identical.

### **1. INTRODUCTION**

The formal procedures determining the conduct of examinations are established and enforced by the University Proctors. These Conventions are a guide to the examiners and candidates but the regulations set out in the Examination Regulations have precedence. Normally the relevant Regulations and Course Handbook are the editions published in the year in which the candidate embarked on the FHS programme.

The attention of candidates for Part I of the Examination is drawn to key phrases in clauses 5 and 7 of Part A and clause 3 under Part I of Part B of the Special Regulations for the Honour School of Materials Science:

Part A. 5. No candidate may present him or herself for examination in Part II unless he or she has been adjudged worthy of Honours by the Examiners in Part I.

Part A. 7. To achieve Honours at Part I normally a candidate must fulfil all of the requirements under (a), (b) & (c) of this clause. (a) Obtain a minimum mark of 40% averaged over all elements of assessment for the Part I Examination, (b) obtain a minimum mark of 40% in each of at least four of the six written papers sat in Trinity Term of the year of Part I of the Second Public Examination, and (c) satisfy the coursework requirements set out in Section B, Part I [of the Regulations].

Part B. Part I. 3. In the assessment of the Materials coursework, the Examiners shall take into consideration the requirement for a candidate to complete satisfactorily the coursework to a level prescribed from time to time by the Faculty of Materials and published in the Course Handbook. Normally, failure to complete satisfactorily all five elements of Materials Coursework will constitute failure of Part I of the Second Public Examination.

The examiners are nominated by the Nominating Committee\* in the Department and those nominations are submitted for approval by the Vice-Chancellor and the Proctors. Formally, examiners are independent of the Department and of those who lecture courses. However, for written papers on Materials Science in Part I examiners are expected to consult with course

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\* for the 2013-14 examinations the Nominating Committee comprised Prof Grovenor & Dr Taylor.

lecturers in the process of setting questions. The paragraphs below indicate the conventions to which the examiners usually adhere, subject to the guidance of the appointed external examiners, and other bodies such as the Academic Committee in the Department, the Mathematical, Physical and Life Sciences Division, the Education Committee of the University and the Proctors who may offer advice or make recommendations to examiners.

The Materials Science Examiners in Trinity 2014 are: Prof. Richard Todd (Chair), Prof. Angus Kirkland, Prof. Chris Grovenor, Dr Jason Smith, Dr Jan Czernuszka and Dr Simon Benjamin. The external examiners are Prof. Grace Burke, University of Manchester, and Prof. Peter Haynes, Imperial College, London.

It must be stressed that to preserve the independence of the examiners, candidates are not allowed to make contact directly about matters relating to the content or marking of papers. Any communication must be via the Senior Tutor of your college, who will, if he or she deems the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chairman of Examiners.

If there are believed to be mitigating circumstances, such as illness, which may have affected the candidate's progress with coursework or performance in a written exam these should be drawn to the attention of the Senior Tutor at the candidate's college as soon as practicable. The Senior Tutor will, if appropriate, inform the Proctors who in turn may communicate with the Chairman of Examiners about the mitigating circumstances. Subject to guidance from the Proctors, if appropriate the Board of Examiners will take into account these mitigating circumstances.

During the marking process the scripts of all *written papers* remain anonymous to the markers. [In some of the descriptions of marking for individual elements of *coursework* that are given later in this document the term 'double marked, blind,' is used; this refers to the fact that the second marker does not see the marks awarded by the first marker until he or she has recorded his or her own assessment, and does not indicate that the candidate is anonymous to the markers.]

### **Procedures covering late submission of or failure to submit/deliver one or more elements of coursework to the Examiners**

The Examination Regulations stipulate specific dates for submission of the required elements of coursework to the Examiners (1. One piece of Engineering & Society Coursework; 2. A set of twelve reports of practical work as specified in the Course Handbook (normally each individual report within the set has been marked already as the laboratory course progresses); 3. A Team Design Project Report and associated oral presentation; 4. A set of four Industrial Visit Reports as

specified in the course handbook; 5. A report on the work carried out in either the Characterisation of Materials module or the Introduction to Modelling in Materials module; and 6. A Part II Thesis). Rules governing late submission of these six elements of coursework and any consequent penalties are set out in the 'Late submission of work' clause of the 'Regulations for the Conduct of University Examinations' section of the Examination Regulations (Part 16, 'Marking & Assessment' in the 2013 Regulations).

Under the provisions permitted by the regulation, late submission of an element of coursework, as defined above, for Materials Science or Materials, Economics & Management examinations will normally result in one of the following:

- (a) With permission from the Proctors under clause (2) of para 16.8 no penalty.
- (b) With permission from the Proctors under clauses (3) or (4) of para 16.8, for the first day or part of the first day that the work is late a penalty of a reduction in the mark for the coursework in question of up to 10% of the maximum mark available for the piece of work, and for each subsequent day or part of a day that the work is late a further penalty of up to 5% of the maximum mark available for the piece of work; the exact penalty to be set by the Examiners with due consideration given to the circumstances and to any advice given in the Proctors' "Notes for the Guidance of Examiners and Chairmen of Examiners". The reduction may not take the mark below 40%.
- (c) Where the candidate is not permitted by the Proctors to remain in the examination, he or she will be deemed to have failed the examination as a whole.
- (d) Where, without the permission of the Proctors under clauses (3) or (4) of para 16.8, work is proffered so late that it would be impractical to accept it for assessment a mark of zero shall be recorded and, as per the Special Regulations for the Honour School of Material Science, normally the candidate will have failed Part I or II as appropriate of the Examination as a whole.
- (e) Where no work is submitted a mark of zero shall be recorded and, as per the Special Regulations for the Honour School of Material Science, normally the candidate will have failed Part I or II as appropriate of the Examination as a whole.

Where an element of coursework is not submitted or is proffered so late that it would be impractical to accept it for assessment the Proctors may, exceptionally, under their general authority, and after (i) making due enquiries into the circumstances and (ii) consultation with the Chairman of the Examiners, permit the candidate to remain in the examination. In this case *for the element of coursework in question* (i) the Examiners will award a mark of zero and (ii) dispensation will be granted from the Regulation that requires a minimum mark of 40% if the candidate is not to fail the examination as a whole.

## Elements of coursework comprising more than one individual piece of assessed coursework

Penalties for late submission of individual practical reports are set out in the MS/MEM FHS Handbook and are **separate** to the provisions described above.

The consequences of failure to submit individual practical reports or failure to submit/deliver other individual pieces of assessed coursework that contribute to one of the *elements* of coursework scheduled in the Special Regulations for the Honour School of Material Science are set out in the MS/MEM FHS Handbook (sections 7 and 10.8 of the 2013/14 version) and are **separate** to the provisions described above. In short normally this will be deemed to be a failure to complete satisfactorily the relevant element of Materials Coursework and will therefore constitute failure of Part I of the Second Public Examination.

Where an individual practical report or other individual piece of assessed coursework that contributes to one of the *elements* of coursework scheduled in the Special Regulations for the Honour School of Material Science is not submitted or is proffered so late that it would be impractical to accept it for assessment the Proctors may, exceptionally, under their general authority, and after (i) making due enquiries into the circumstances and (ii) consultation with the Chairman of the Examiners, permit the candidate to remain in the examination. In this case *for the individual piece of coursework in question* (i) the Examiners will award a mark of zero and (ii) dispensation will be granted from the Regulation that requires submission/delivery of every individual piece of assessed coursework if the candidate is not to fail the examination as a whole.

## **2. PART I**

### *(1) Setting of papers*

Part I General Papers 1 – 4 are set by the examiners in consultation with course lecturers. The responsibility for the setting of each examination paper is assigned to an examiner, and a second examiner is assigned as a checker. Option papers are set by lecturers of the option courses and two examiners, the examiners acting as checkers. The examiners, in consultation with lecturers, produce model answers for every question set. The wording and content of all examination questions set, and the model answers, are scrutinised by all examiners, including, in particular, the external examiners.

### *(2) Paper Format*

All General papers comprise eight questions from which candidates attempt five. Each question is worth 20 marks. The total number of marks available on each general paper is 100. Materials Option papers comprise one section for each twelve-hour Options lecture course, each section containing two questions: candidates are required to answer one question from each of any three sections and a fourth question drawn from any one of the same three sections. The total number of

marks available on each option paper is 100, and all questions carry equal marks. Questions are often divided into parts, with the marks for each part indicated on the question paper. Marking criteria are given in section 5.

(3) *Marking of papers*

All scripts are double marked, blind, by the setter and the checker. After individual marking the two examiners meet to agree marks question by question. If the differences in marks are small (~10% of the total available for the question, 2-3 marks for most questions), the two marks are averaged, with no rounding applied. Otherwise the examiners identify the discrepancy and read the answer again, either in whole or in part, to reconcile the differences. If after this process the examiners still cannot agree, they seek the help of the Chairman, or another examiner as appropriate, to adjudicate. An integer total mark for each paper is awarded, where necessary rounding up to achieve this.

Options papers are marked by course lecturers acting as assessors and an examiner acting as a checker.

The external examiners provide an independent check on the whole process of setting and marking.

The rubric on each paper indicates a prescribed number of answers required (e.g. "candidates are required to submit answers to no more than five questions"). Candidates will be asked to indicate on their cover sheet which questions, up to the prescribed number, they are submitting for marking. If the cover slip is not completed then the examiners will mark the first five questions in numerical order by question number. The examiners will NOT mark questions in excess of the prescribed number. If fewer questions than the prescribed number are attempted, (i) each missing attempt will be assigned a mark of zero, (ii) for those questions that are attempted **no** marks beyond the maximum per question indicated under section 2(2) above will be awarded and (iii) the mark for the paper will still be calculated out of 100.

As the total number of students is small, it is not unusual for mean marks to vary from paper to paper, or year to year. It is not therefore normal practice to adjust marks to fit any particular distribution. However, where marks for papers are unusually high or low, the examiners may, having reviewed the difficulty of the paper set or other circumstances, decide with the agreement of the external examiner to adjust all marks for those papers. Such adjustment is referred to as 'scaling' and the normal procedure will be as follows:

- a. Papers with a *mean taken over all candidates* of less than 55% or more than 75% are normally adjusted to bring the *mean* respectively up to 55% or down to 75%. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's score for the paper.

- b. For papers with a mean in the ranges either of 55-60% or 70-75%, including those scaled under (i) above, the questions and typical answers are compared in order to ascertain, with the help of the external examiners, whether the marks are a fair reflection of the performance of the candidates as measured against the class descriptors. If not, the marks are adjusted. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's score for the question or for the paper.
- c. The mean mark and the distribution of marks, both taken over all written papers, are considered, again with the help of the external examiners, in order to ascertain whether these overall marks are a fair reflection of the performance of the candidates as measured against the class descriptors. If not, the overall marks are adjusted. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's overall score.

#### *(4) Marking of Second Year Practicals for Part I*

Second year practicals are assessed continually by senior demonstrators in the teaching laboratory and in total are allocated 60 marks. Part I examiners have the authority to set a practical examination. Penalties for late submission of an individual practical report are prescribed in the Course Handbook and are applied prior to any additional penalties incurred under the provision of section 1 of the present Conventions.

#### *(5) Marking Industrial Visits*

Four industrial visit reports should be submitted during Part I. Reports are assessed by the Industrial Visits Academic Organiser on a good / satisfactory / non-satisfactory basis, and are allocated a total of 20 marks. Guidance on the requirements for the reports is provided at the annual 'Introduction to Industrial Visits' talk. Formative feedback is provided on the first of the four reports.

#### *(6) Marking Engineering and Society Essays*

The business plan for "Entrepreneurship and new ventures" is double marked, blind, by two assessors appointed by the Faculty of Materials. The written business plan is allocated a total of 20 marks. Guidance on the requirements for the written business plan and an outline marking scheme are published in the FHS Course Handbook. Further guidance is provided at the 'Building a Business' tutorials, the slides from which are published on WebLearn.

If the Foreign Language Option or a Supplementary Subject has been offered instead of the Business Plan, the reported % mark, which is arrived at in accordance with the CVCP degree class boundary descriptors, is divided by five to give a mark out of 20.



(7) *Marking the Team Design Project*

The team design project is double marked, blind, by two of the Part I Examiners. They then compare marks and analyse any significant disagreement between these marks before arriving at a final agreed mark for each project and each team member. Supervisors of the projects submit a written report to the examiners on the work carried out by their teams and these are taken into consideration when the examiners decide the final agreed marks. Industrial representatives may be asked to contribute to the assessment process. The project is allocated 50 marks, of which 25 are for the written report and 25 for the oral presentation. The same two examiners assess both the reports and the presentations. Guidance on the requirements for the report and an outline marking scheme are provided in the 'Team Design Projects Briefing Note' published on the Teaching pages of the Oxford Materials website.

(8) *Marking the Characterisation of Materials and the Introduction to Materials Modelling modules*

The reports for these modules are double marked, blind, by the module assessors. Normally, at least one of the two assessors for each report will be a module organizer. The assessors then compare marks and analyse any significant disagreement between these marks before arriving at a final agreed mark for each report. The Chairman of Examiners oversees this process, sampling reports to ensure consistency between the different pairs of assessors and the two modules. The lead organizer for the Characterisation Module submits to the Assessors and Examiners of the module a short report which provides, by sample set only, (i) a summary of the availability of appropriate characterization instruments during the two-week module and (ii) any other pertinent information. An analogous report is provided by the lead organizer for the Modelling Module in respect of the software & hardware required for each mini-project. The Report for the Characterisation module is allocated 50 marks and each of the two reports for the Modelling module are allocated 25 marks. For each module, guidance on the requirements for the reports and an outline marking scheme are published on WebLearn.

### **3. PART II**

The Part II project is assessed by means of a thesis which is submitted to the Examiners, who will also take into account a written report from the candidate's supervisor\*. The marking criteria are published in the Part II Course Handbook.

The project is allocated 400 marks, which is one third of the total marks for Parts I and II. Two Part II examiners read the thesis, including the project management chapter, together with Part A of the supervisor's report, and each of them independently allocates a provisional mark based on the

guidelines\*\* published in the course handbook. In addition, normally the thesis will be seen by one of the two external examiners.

A *viva voce* examination is held: the purpose of the viva is to clarify any points the readers believe should be explored, and to ascertain the extent to which the work reported is the candidate's. An examiners' discussion is held after the viva, involving all Part II examiners, and at which time Part B of the supervisor's report is taken into account. The outcome of the discussion is an agreed mark for the project. In arriving at the agreed mark the Examiners will take into account all of the following, (i) the comments and provisional marks of the original markers, (ii) the candidate's understanding of their work as demonstrated during the viva and (iii) the opinion of the external examiner who has seen the thesis. It is stressed that it is the scientific content of the project and the candidate's understanding of their work that is being considered in the viva.

If the two provisional marks allocated in advance of the viva differ significantly (that is, normally by more than 10% of the maximum available for a Part II project) this will be addressed explicitly during the discussion after the viva. In the majority of other cases the viva has only a small influence on the agreed mark awarded to a Part II thesis.

If there are believed to be mitigating circumstances, such as illness, which may have affected the candidate's progress with the project these should, in the normal way, be drawn to the attention of the Senior Tutor at the candidate's college, who will, if appropriate, inform the Proctors. The Proctors may in turn communicate with the Chairman of Examiners about the mitigating circumstances. Subject to guidance from the Proctors, if appropriate the Board of Examiners will take into account these mitigating circumstances in their discussion after the viva.

\* The Supervisor's report is divided into Parts A & B: Part A provides simple factual information that is of significance to the examiners, such as availability of equipment, and is seen by the two markers before they read and assess the thesis. Part A does **not** include personal mitigating circumstances which, subject to guidance from the Proctors, normally are considered only in discussion with **all** Part II examiners thus ensuring equitable treatment of all candidates with mitigating circumstances. Part B of the supervisor's report provides her/his opinion of the candidate's engagement with the project and covers matters such as initiative and independence; it is not seen by the examiners until the discussion held after the viva.

\*\* These guidelines may change and candidates are notified of any such changes before the end of Hilary

Term of their 4<sup>th</sup> year.

#### 4. CLASSIFICATION & MARKING CRITERIA

The following boundaries (CVCP) and descriptors (MPLSD) are used as guidelines:

Class I Honours 70 – 100	The candidate shows excellent problem-solving skills and excellent knowledge of the material over a wide range of topics, and is able to use that knowledge innovatively and/or in unfamiliar contexts.
Class Iii Honours 60 – 69	The candidate shows good or very good problem-solving skills, and good or very good knowledge of much of the material over a wide range of topics.
Class Iiii Honours 50 – 59	The candidate shows basic problem-solving skills and adequate knowledge of most of the material.
Class III Honours 40 - 49	The candidate shows reasonable understanding of at least part of the basic material and some problem solving skills. Although there may be a few good answers, the majority of answers will contain errors in calculations and/or show incomplete understanding of the topics.
Pass 30 - 39	The candidate shows some limited grasp of basic material over a restricted range of topics, but with large gaps in understanding. There need not be any good quality answers, but there will be indications of some competence.
Fail 0 - 29	The candidate shows inadequate grasp of the basic material. The work is likely to show major misunderstanding and confusion, and/or inaccurate calculations; the answers to most of the questions attempted are likely to be fragmentary only.

In borderline cases the examiners use their discretion and consider the overall quality of the work the candidate has presented for examination. The external examiner often plays a key role in such cases.

##### **Part I:**

Unclassified Honours – The examiners are required to classify each candidate according to her/his overall average mark in Part I as (a) worthy of Honours, (b) Pass or (c) Fail. A candidate is allowed to proceed to Part II only if he/she has been adjudged worthy of honours by the examiners in Part I. The examiners do not divide the categories further but tutors and students may infer how well they have done from their marks. Candidates adjudged worthy of honours normally proceed to Part II but they may, if they wish and subject to approval from the relevant bodies, leave after Part I in which case an Unclassified Honours B.A. degree will be awarded.

Pass – The examiners consider that the candidate is not worthy of honours and therefore will not be allowed to proceed to Part II. The candidate may leave with a B.A. (without honours) or may retake Part I the following year (subject to college approval).

Fail – The examiners consider that the candidate is not worthy of a B.A. The candidate either leaves without a degree or may retake Part I the following year (subject to college approval).

## **Part II:**

Classified Honours – Once marking is completed for both Parts I and II an overall percentage mark is computed for each candidate and classification then takes place. Subject to the requirement that Part II be adjudged worthy of honours (see below), classification is based solely on the overall percentage mark; the candidate's profile of marks from each element of assessment is only taken into account in borderline cases. However, a candidate cannot be awarded an M.Eng. degree unless his/her performance in Part II is adjudged worthy of honours i.e. a candidate must be adjudged worthy of honours both in Part I and in Part II to be awarded the M.Eng. degree. Failure to achieve honours in Part II will result in the candidate leaving with an unclassified B.A. (Hons) irrespective of the aggregate mark.

Pass – Notwithstanding the award of unclassified honours in Part I, the examiners consider that the candidate's overall performance is not worthy of an M.Eng. The candidate is listed as a Pass on the class list and is awarded an unclassified B.A. (Hons) on the basis of Part I performance.

Fail – The examiners consider that the candidate's overall performance is not worthy of an M.Eng. *and* that the performance in Part II is not worthy of a Pass. The candidate is excluded from the class list but is nevertheless awarded an unclassified B.A. (Hons) on the basis of Part I performance.

- The examiners cannot award unclassified honours on the basis of Part II performance unless permitted to do so by the Proctors.
- Nevertheless, candidates awarded a Pass or a Fail by the Part II examiners leave with an unclassified B.A. (Hons) because they were judged worthy of that in Part I (i.e. their degree is the same as if they had left immediately after Part I).
- In terms of the degree awarded, there is no difference between a Pass and a Fail in Part II. The only difference is whether or not the name appears on the class list.
- Candidates cannot normally retake Part II because the Examination Regulations require that they must pass Part II within one year of passing Part I. This rule can be waived only in exceptional circumstances, with permission from the Education Committee.

**Annex: Summary of marks to be awarded for different components of the MS Final Examination in 2014 (For Part I and Part II students who embarked on the FHS respectively in 2012/13 and 2011/12)**

	<b>Component</b>	<b>Mark</b>
<b>Part I</b>	General Paper 1	100
	General Paper 2	100
	General Paper 3	100
	General Paper 4	100
	Materials Options Paper 1	100
	Materials Options Paper 2	100
	Practicals & Industrial visits	80
	Engineering and Society coursework	20
	Team Design Project	50
	Characterisation or Modelling module	50
	<i>Part I Total</i>	<i>800</i>
<b>Part II</b>	Thesis	400
<i>Overall Total</i>	<i>1200</i>	

## **Appendix O Examination Conventions: Materials, Economics & Management 2013-14**

The Examination Conventions for 2013-14 are shown below. Note that the Conventions for 2014-15 will be based on those for 2013-14 but may not be identical.

### **1. INTRODUCTION**

The formal procedures determining the conduct of examinations are established and enforced by the University Proctors. These Conventions are a guide to the examiners and candidates but the regulations set out in the Examination Regulations have precedence. Normally the relevant Regulations and Course Handbook are the editions published in the year in which the candidate embarked on the FHS programme.

The attention of candidates for Part I of the Examination is drawn to key phrases in clauses 6 and 7 of Part A and under Part I of Part B of the Special Regulations for the Honour School of Materials, Economics and Management:

Part A. 6. ...no candidate may present him or herself for examination in Part II unless he or she has been adjudged worthy of Honours by the Examiners in Part I.

Part A. 7. To achieve Honours at Part I normally a candidate must fulfil all of the requirements under (a), (b) & (c) of this clause. (a) Obtain a minimum mark of 40% averaged over all elements of assessment for the Part I Examination, (b) obtain a minimum mark of 40% in each of at least four of the six written papers sat in Trinity Term of the year of Part I of the Second Public Examination, and (c) satisfy the coursework requirements set out in Section B, Part I [of the Regulations].

Part B. Part I. In the assessment of the Materials coursework, the Examiners shall take into consideration the requirement for a candidate to complete satisfactorily the coursework to a level prescribed from time to time by the Faculty of Materials and published in the Course Handbook. Normally, failure to complete satisfactorily all three elements of Materials Coursework will constitute failure of Part I of the Second Public Examination.

The examiners are nominated by the Nominating Committee\* in the Department of Materials and those nominations are submitted for approval by the Vice-Chancellor and the Proctors. Formally,

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\* for the 2013-14 examinations the Nominating Committee comprised Prof Grovenor & Dr Taylor.

examiners are independent of the Department and of those who lecture courses. However, for written papers on Materials Science in Part I and Part II, examiners are expected to consult with course lecturers in the process of setting questions. The paragraphs below indicate the conventions to which the examiners usually adhere, subject to the guidance of the appointed external examiners, and other bodies such as the Academic Committee in the Department, the E(M)EM Standing Committee, the Mathematical, Physical and Life Sciences Division, the Social Sciences Division, the Education Committee of the University and the Proctors who may offer advice or make recommendations to examiners.

The Materials Science Examiners in Trinity 2014 are: Prof. Richard Todd (Chair), Prof. Angus Kirkland, Prof. Chris Grovenor, Dr Jason Smith, Dr Jan Czernuszka and Dr Simon Benjamin. The external examiners are Prof. Grace Burke, University of Manchester, and Prof. Peter Haynes, Imperial College, London.

The Materials, Economics and Management Examiners in Trinity 2014 are: Prof. Richard Todd (Chair), Prof. Angus Kirkland, Prof. Chris Grovenor, Dr Jason Smith, Dr Jan Czernuszka and Dr Simon Benjamin (examiners from the Department of Materials Science); Dr Owen Darbishire, Prof. Roy Westbrook (examiners from the Said Business School); and Prof. John Quah, Dr Alan Beggs, (examiners from the Department of Economics). The external examiners are Prof. Grace Burke, University of Manchester; Prof. Peter Haynes, Imperial College, London; Dr Helen Simpson (Economics, University of Bristol) and Prof. Steve Wood (Management, Surrey Business School).

It must be stressed that to preserve the independence of the examiners, candidates are not allowed to make contact directly about matters relating to the content or marking of papers. Any communication must be via the Senior Tutor of your college, who will, if he or she deems the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chairman of Examiners.

If there are believed to be mitigating circumstances, such as illness, which may have affected the candidate's progress with coursework or performance in a written exam these should be drawn to the attention of the Senior Tutor at the candidate's college as soon as practicable. The Senior Tutor will, if appropriate, inform the Proctors who in turn may communicate with the Chairman of Examiners about the mitigating circumstances. Subject to guidance from the Proctors, if appropriate the Board of Examiners will take into account these mitigating circumstances.

During the marking process the scripts of all *written* papers remain anonymous to the markers. [In some of the descriptions of marking for individual elements of *coursework* that are given later in this document the term ‘double marked, blind,’ is used; this refers to the fact that the second marker does not see the marks awarded by the first marker until he or she has recorded his or her own assessment, and does not indicate that the candidate is anonymous to the markers.]

### **Procedures covering late submission of or failure to submit/deliver one or more elements of coursework to the Examiners**

The Examination Regulations stipulate specific dates for submission of the required elements of coursework to the Examiners (1. A set of nine reports of practical work as specified in the Course Handbook (normally each individual report within the set has been marked already as the laboratory course progresses); 2. A Team Design Project Report and associated oral presentation; 3. A set of four Industrial Visit Reports as specified in the course handbook; and 4. A Part II Management Project Report). Rules governing late submission of these four elements of coursework and any consequent penalties are set out in the ‘Late submission of work’ clause of the ‘Regulations for the Conduct of University Examinations’ section of the Examination Regulations (Part 16, ‘Marking & Assessment’ in the 2013 Regulations).

Under the provisions permitted by the regulation, late submission of an element of coursework, as defined above, for Materials Science or Materials, Economics & Management examinations will normally result in one of the following:

- (a) With permission from the Proctors under clauses (3) or (4) of para 16.8, for the first day or part of the first day that the work is late a penalty of a reduction in the mark for the coursework in question of up to 10% of the maximum mark available for the piece of work, and for each subsequent day or part of a day that the work is late a further penalty of up to 5% of the maximum mark available for the piece of work; the exact penalty to be set by the Examiners with due consideration given to the circumstances and to any advice given in the Proctors’ “Notes for the Guidance of Examiners and Chairmen of Examiners”. The reduction may not take the mark below 40%.
- (b) Where the candidate is not permitted by the Proctors to remain in the examination, he or she will be deemed to have failed the examination as a whole.
- (c) Where, without the permission of the Proctors under clauses (3) or (4) of para 16.8, work is proffered so late that it would be impractical to accept it for assessment a mark of zero shall be recorded and, as per the Special Regulations for the Honour School of Materials, Economics & Management, normally the candidate will have failed Part I or II as appropriate of the Examination as a whole.



- (d) Where no work is submitted a mark of zero shall be recorded and, as per the Special Regulations for the Honour School of Materials, Economics & Management, normally the candidate will have failed Part I or II as appropriate of the Examination as a whole.

Where an element of coursework is not submitted or is proffered so late that it would be impractical to accept it for assessment the Proctors may, exceptionally, under their general authority, and after (i) making due enquiries into the circumstances and (ii) consultation with the Chairman of the Examiners, permit the candidate to remain in the examination. In this case *for the element of coursework in question* (i) the Examiners will award a mark of zero and (ii) dispensation will be granted from the Regulation that requires a minimum mark of 40% if the candidate is not to fail the examination as a whole.

#### Elements of coursework comprising more than one individual piece of assessed coursework

Penalties for late submission of individual practical reports are set out in the MS/MEM FHS Handbook and are **separate** to the provisions described above.

The consequences of failure to submit individual practical reports or failure to submit/deliver other individual pieces of assessed coursework that contribute to one of the elements of coursework scheduled in the Special Regulations for the Honour School of Materials, Economics & Management are set out in the MS/MEM FHS Handbook (sections 7 and 10.8 of the 2013/14 version) and are **separate** to the provisions described above. In short normally this will be deemed to be a failure to complete satisfactorily the relevant element of Materials Coursework and will therefore constitute failure of Part I of the Second Public Examination.

Where an individual practical report or other individual piece of assessed coursework that contributes to one of the *elements* of coursework scheduled in the Special Regulations for the Honour School of Materials, Economics and Management is not submitted or is proffered so late that it would be impractical to accept it for assessment the Proctors may, exceptionally, under their general authority, and after (i) making due enquiries into the circumstances and (ii) consultation with the Chairman of the Examiners, permit the candidate to remain in the examination. In this case *for the individual piece of coursework in question* (i) the Examiners will award a mark of zero and (ii) dispensation will be granted from the Regulation that requires submission/delivery of every individual piece of assessed coursework if the candidate is not to fail the examination as a whole.

## 2. PARTS I & II

### **Candidates taking Ec1: Introductory Economics in the 2<sup>nd</sup> year.**

MEM candidates sit the compulsory Ec1: Introductory Economics paper in Trinity Term of their second year. This paper will be set and examined as for all other Part I and Part II Economics papers (see below) and contributes to the Part I mark. The marks for this paper will be formally ratified by the Board of examiners for Part I examinations held in the Trinity Term following that in which the Ec1 paper is sat.

### **Candidates for Part I (3<sup>rd</sup> year)**

Part I candidates take four compulsory Materials papers (General Papers 1 – 4); one compulsory Economics paper; and one compulsory Management paper. In addition, candidates are assessed on their Materials coursework (practical work, the team design project, and industrial visits). Marks from the Ec1 paper sat in Trinity Term of the 2<sup>nd</sup> year are included in the Part I total.

### **Candidates for Part II (4<sup>th</sup> year)**

Part II candidates take one compulsory Materials Options paper and one paper from a range of Management and Economics options. In addition they are assessed on their report of a six-month industrial placement, which carries the weight of two papers.

#### *(1) Setting of papers*

Part I Materials General Papers 1 – 4 are set by the materials examiners in consultation with course lecturers. The responsibility for the setting of each examination paper is assigned to an examiner, and a second examiner is assigned as a checker. The Materials Option paper in Part II is set by lecturers of the option courses and two examiners, the examiners acting as checkers. For the Materials papers, the examiners, in consultation with lecturers, produce model answers for every question set. The wording and content of all examination questions set, and the model answers, are scrutinised by all examiners, including, in particular, the external examiners. The Economics and Management papers are set by examiners nominated respectively by the Economics Faculty and the Saïd Business School.

#### *(2) Paper format*

### **Materials Papers**

All Materials general papers comprise eight questions from which candidates attempt five and are taken in Part I. Each question is worth 20 marks. The total number of marks available on each general paper is 100. Materials Option papers comprise one section for each twelve-hour Options lecture course, each section containing two questions: candidates are required to answer one question from each of any three sections and a fourth question drawn from any one of the same

three sections. The total number of marks available on each option paper is 100, and all questions carry equal marks. Questions are often divided into parts, with the marks for each part indicated on the question paper. Marking criteria are given in section 5.

### **Economics and Management papers**

Candidates are advised to read particularly carefully the specific instructions on the front of each paper as to the number of questions they should submit, since the rubrics on Economics and Management papers differ slightly from those for the Materials papers.

#### *(3) Marking of papers*

### **Materials Papers**

All scripts are double marked, blind, by the setter and the checker. After individual marking the two examiners meet to agree marks question by question. If the differences in marks are small (~10% of the total available for the question, 2-3 marks for most questions), the two marks are averaged, with no rounding applied. Otherwise the examiners identify the discrepancy and read the answer again, either in whole or in part, to reconcile the differences. If after this process the examiners still cannot agree, they seek the help of the Chairman, or another examiner as appropriate, to adjudicate. An integer total mark for each paper is awarded, where necessary rounding up to achieve this.

The Materials Options paper is marked by course lecturers acting as assessors and an examiner acting as a checker.

The Materials external examiners provide an independent check on the whole process of setting and marking.

The rubric on each paper indicates a prescribed number of answers required (e.g. "candidates are required to submit answers to no more than five questions"). Candidates will be asked to indicate on their cover sheet which questions, up to the prescribed number, they are submitting for marking. If the cover slip is not completed then the examiners will mark the first five questions in numerical order by question number. The examiners will NOT mark questions in excess of the prescribed number. If fewer questions than the prescribed number are attempted, (i) each missing attempt will be assigned a mark of zero, (ii) for those questions that are attempted **no** marks beyond the maximum per question indicated under section 2(2) above will be awarded and (iii) the mark for the paper will still be calculated out of 100.

As the total number of students sitting some papers is small, it is not unusual for mean marks to vary from paper to paper, or year to year. It is not therefore normal practice to adjust marks to fit any particular distribution. However, where marks for papers are unusually high or low, the examiners may, having reviewed the difficulty of the paper set or other circumstances, decide with

the agreement of the external examiners to adjust all marks for those papers. For the Materials papers such adjustment is referred to as 'scaling' and the normal procedure will be as follows:

- a. Papers with a *mean taken over all candidates* of less than 55% or more than 75% are normally adjusted to bring the *mean* respectively up to 55% or down to 75%. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's score for the paper.
- b. For papers with a mean in the ranges either of 55-60% or 70-75%, including those scaled under (i) above, the questions and typical answers are compared in order to ascertain, with the help of the external examiners, whether the marks are a fair reflection of the performance of the candidates as measured against the class descriptors. If not, the marks are adjusted. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's score for the question or for the paper.
- c. The mean mark and the distribution of marks, both taken over all written papers, are considered, again with the help of the external examiners, in order to ascertain whether these overall marks are a fair reflection of the performance of the candidates as measured against the class descriptors. If not, the overall marks are adjusted. Normally this is achieved by adding/subtracting the same fixed number of marks to/from each candidate's overall score.

### **Economics and Management Papers**

The rubrics on Management and Economics papers differ slightly from the above, but numerical marking is used and all examiners mark to the standard class boundaries [see section on classification] and range of marks (0-100). All scripts in Economics and Management are double-marked, blind. The two assessors who marked the script then meet in order to reach an agreed mark. Should they fail to agree, then the appropriate set of Economics and Management Examiners will determine the final mark.

In cases of short weight, the maximum achievable mark is lowered by the proportion of the paper missing. (For example, in a paper requiring four answers where a candidate has attempted only three, the maximum achievable mark is 75.) In cases where an answer has been partially completed, the marks will use their discretion to decide what proportion of the answer is missing. Marks reflecting such a penalty are flagged "SW" with the proportion of the paper completed (e.g. "SW 75%). In the case of overweight papers it is left to the discretion of the two markers to decide which of the material to disregard. In cases where the rubric requires candidates to show a specified breadth of knowledge, and where it is unambiguously clear that such a requirement has not been met, the mark for the script will be lowered by at least 5 points. Marks reflecting such a penalty are flagged by "RR" with the number of marks deducted.

As the total number of MEM students is small, it is not unusual for mean marks to vary from paper to paper, or year to year. It is not therefore normal practice to adjust marks to fit any particular distribution. However, where marks for papers are unusually high or low, the examiners may, having reviewed the difficulty of the paper set or other circumstances, decide with the agreement of the external examiners to adjust all marks for those papers. Where a paper has been taken by both MEM and EEM students normally the decision will be informed by the mean and the distribution of marks taken over all EEM & MEM candidates for that paper. Such adjustment is referred to as 'scaling' and in deciding what scaling, if any, to apply normally the examiners will take into account the following additional information:

- (a) For each paper, comments from the MEM examiners representing the Economics or Management Faculty as appropriate
- (b) A report by the Chairman of Examiners on any scaling adopted by the EEM examiners
- (c) The performance of the MEM cohort and the MEM+EEM cohort on the other Economics and Management papers
- (d) The performance of the MEM cohort on the Materials papers

#### (4) *Marking of Practicals for Part I*

Practicals are assessed continually by senior demonstrators in the teaching laboratory and in total are allocated 50 marks. Part I examiners have the authority to set a practical examination. Penalties for late submission of an individual practical report are prescribed in the Course Handbook and are applied prior to any additional penalties incurred under the provision of section 1 of the present Conventions.

#### (5) *Marking Industrial Visits*

Four industrial visit reports should be submitted during Part I. Reports are assessed by the Industrial Visits Academic Organiser on a good / satisfactory / non-satisfactory basis, and are allocated a total of 20 marks. Guidance on the requirements for the reports is provided at the annual 'Introduction to Industrial Visits' talk. Formative feedback is provided in the first of the four reports.

#### (6) *Marking the Team Design Projects*

The team design project is double marked, blind, by two of the Part I Examiners. They then compare marks and analyse any significant disagreement between these marks before arriving at a final agreed mark for each project and each team member. Supervisors of the projects submit a written report to the examiners on the work carried out by their teams and these are taken into consideration when the examiners decide the final agreed marks. Industrial representatives may

be asked to contribute to the assessment process. The project is allocated 50 marks, of which 25 are for the written report and 25 for the oral presentation. The same two examiners assess both the reports and the presentations. Guidance on the requirements for the report and an outline marking scheme are provided in the 'Team Design Projects Briefing Note' published on the Teaching pages of the Oxford Materials website.

(7) *Marking the 4<sup>th</sup> Year Management Project*

The management project is allocated 200 marks and is marked by the Saïd Business School.

The projects are assessed and graded independently by two Assessors. The supervisor's comments on the performance of the candidate are provided to the Assessors. The marks provided by the Assessors are moderated by an Examiner, and the final mark is ratified by the Board of Examiners.

The process is:

- Supervisors provide a report on the performance of the student, indicating any special circumstances that could have affected the student's performance on the project and report preparation.
- The project reports are graded blind by two Assessors, taking account of the Supervisor's comments. At least one of the Assessors will have knowledge of the area of the project.
- The Supervisor's report, and Assessors' reports and marks are provided to an Examiner, who moderates the marks and provides a final mark for ratification by the Board of Examiners.
- Supervisors may not act as Assessor or Examiner for a project they have supervised.
- An Assessor may also act as Examiner for a project. The Assessor should assess and mark the report before having sight of the other Assessor's report and marks.

### 3. CLASSIFICATION & MARKING CRITERIA

The following boundaries (CVCP) and descriptors (MPLSD) are used as guidelines:

Class I Honours 70 – 100	The candidate shows excellent problem-solving skills and excellent knowledge of the material over a wide range of topics, and is able to use that knowledge innovatively and/or in unfamiliar contexts.
Class Iii Honours 60 – 69	The candidate shows good or very good problem-solving skills, and good or very good knowledge of much of the material over a wide range of topics.
Class Iiii Honours 50 – 59	The candidate shows basic problem-solving skills and adequate knowledge of most of the material.
Class III Honours 40 - 49	The candidate shows reasonable understanding of at least part of the basic material and some problem solving skills. Although there may be a few good answers, the majority of answers will contain errors in calculations and/or show incomplete understanding of the topics.
Pass 30 - 39	The candidate shows some limited grasp of basic material over a restricted range of topics, but with large gaps in understanding. There need not be any good quality answers, but there will be indications of some competence.
Fail 0 - 29	The candidate shows inadequate grasp of the basic material. The work is likely to show major misunderstanding and confusion, and/or inaccurate calculations; the answers to most of the questions attempted are likely to be fragmentary only.

In borderline cases the examiners use their discretion and consider the overall quality of the work the candidate has presented for examination. The external examiner often plays a key role in such cases.

#### **Part I:**

Unclassified Honours – The examiners are required to classify each candidate according to her/his overall average mark in Part I as (a) worthy of Honours, (b) Pass or (c) Fail. A candidate is allowed to proceed to Part II only if he/she has been adjudged worthy of honours by the examiners in Part I. The examiners do not divide the categories further but tutors and students may infer how well they have done from their marks. Candidates adjudged worthy of

honours normally proceed to Part II but they may, if they wish and subject to approval from the relevant bodies, leave after Part I in which case an Unclassified Honours B.A. degree will be awarded.

Pass – The examiners consider that the candidate is not worthy of honours and therefore will not be allowed to proceed to Part II. The candidate may leave with a B.A. (without honours) or may retake Part I the following year (subject to college approval).

Fail – The examiners consider that the candidate is not worthy of a B.A. The candidate either leaves without a degree or may retake Part I the following year (subject to college approval).

## **Part II:**

Classified Honours – Once marking is completed for both Parts I and II an overall percentage mark is computed for each candidate and classification then takes place. Subject to the requirement that Part II be adjudged worthy of honours (see below), classification is based solely on the overall percentage mark; the candidate's profile of marks from each element of assessment is only taken into account in borderline cases. However, a candidate cannot be awarded an M.Eng. degree unless his/her performance in Part II is adjudged worthy of honours i.e. a candidate must be adjudged worthy of honours both in Part I and in Part II to be awarded the M.Eng. degree. Failure to achieve honours in Part II will result in the candidate leaving with an unclassified B.A. (Hons) irrespective of the aggregate mark.

Pass – Notwithstanding the award of unclassified honours in Part I, the examiners consider that the candidate's overall performance is not worthy of an M.Eng. The candidate is listed as a Pass on the class list and is awarded an unclassified B.A. (Hons) on the basis of Part I performance.

Fail – The examiners consider that the candidate's overall performance is not worthy of an M.Eng. *and* that the performance in Part II is not worthy of a Pass. The candidate is excluded from the class list but is nevertheless awarded an unclassified B.A. (Hons) on the basis of Part I performance.

- The examiners cannot award unclassified honours on the basis of Part II performance unless permitted to do so by the Proctors.
- Nevertheless, candidates awarded a Pass or a Fail by the Part II examiners leave with an unclassified B.A. (Hons) because they were judged worthy of that in Part I (i.e. their degree is the same as if they had left immediately after Part I).
- In terms of the degree awarded, there is no difference between a Pass and a Fail in Part II. The only difference is whether or not the name appears on the class list.



- Candidates cannot normally retake Part II because the Examination Regulations require that they must pass Part II within one year of passing Part I. This rule can be waived only in exceptional circumstances, with permission from the Education Committee.

**Annex: Summary of marks awarded for different components of the MEM Final Examination in 2014 (For Part I and Part II students who embarked on the FHS respectively in 2012/13 and 2011/12)**

	<b>Component</b>	<b>Mark</b>
<b>Part I</b>	General Paper 1	100
	General Paper 2	100
	General Paper 3	100
	General Paper 4	100
	Introductory Economics (Ec1)	100
	General Management	100
	Microeconomics	100
	Practicals & Industrial visits	70
	Team Design Project	50
<i>Part I Total</i>		<i>820</i>
<b>Part II</b>	Management Project	200
	Materials Options Paper 2	100
	One paper from a choice of Economics and Management Papers.	100
	<i>Part II Total</i>	
<i>Overall Total</i>		<i>1220</i>

## **Appendix P      University Policy on Intellectual Property Rights**

Intellectual property (IP) is the result of creativity and innovation, to which legal rights (intellectual property rights) may be associated, such as patents, copyright, trademarks, design and database rights. Oxford was one of the first UK universities to develop an intellectual property policy to govern the ownership and exploitation of IP generated by students and employees in the course of their employment or studies.

Oxford's IP policy is governed by the University's Statutes and Regulations. For ease of reference, an extract from the Statutes and Regulations is reproduced below. The Statutes and Regulations, as they relate to the University's IP policy, together with regulations for the administration of the IP policy, may be found in full on the University website ([www.admin.ox.ac.uk/researchsupport/ip/](http://www.admin.ox.ac.uk/researchsupport/ip/)).

Essential ingredients of the University's approach are a generous revenue-sharing policy, which brings significant personal benefits to researchers (employees or students), and a hugely successful and well-resourced technology transfer operation, Isis Innovation, which has earned national and international recognition. Isis was established specifically to help researchers in the University commercialise their research. Isis files, on average, one new patent a week, and has helped create more than 50 spin-out companies and many more licence deals. Isis works closely with Research Services, a part of the University's central administration. Research Services' remit includes the management of research grants and contracts to the University, and the assignment of University intellectual property to Isis for exploitation.

### **University intellectual property policy**

(Extract from Statute XVI – Part B)

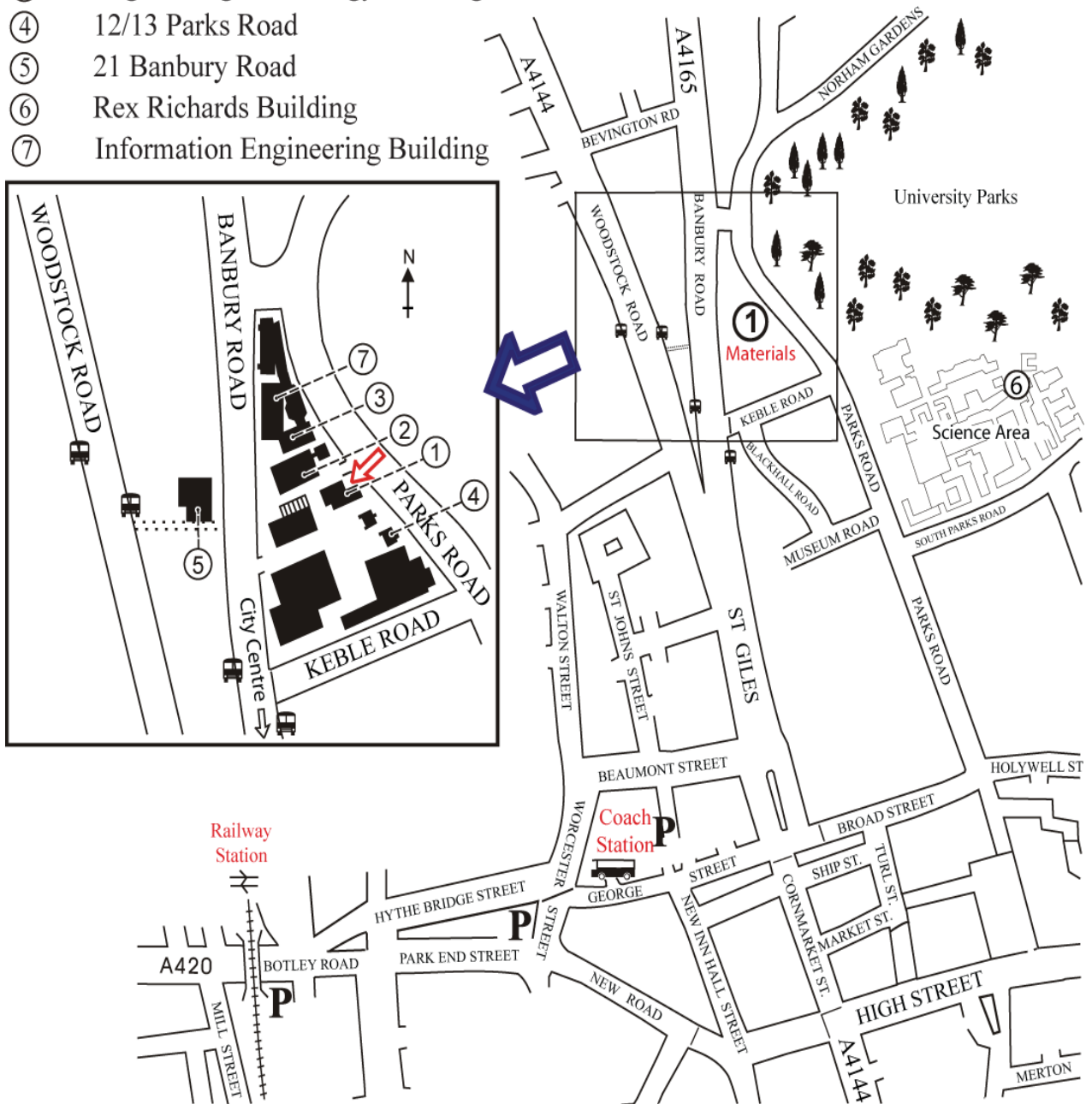
5. (1) The University claims ownership of all intellectual property specified in section 6 of this statute which is devised, made, or created:
  - (a) by persons employed by the University in the course of their employment;
  - (b) by student members in the course of or incidentally to their studies;
  - (c) by other persons engaged in study or research in the University who, as a condition of their being granted access to the University's premises or facilities, have agreed in writing that this Part shall apply to them; and
  - (d) by persons engaged by the University under contracts for services during the course of or incidentally to that engagement.

- (2) The University's rights under sub-section (1) above in relation to any particular piece of intellectual property may be waived or modified by agreement in writing with the person concerned.
6. The intellectual property of which ownership is claimed under section 5 (1) of this statute comprises:
  - (1) works generated by computer hardware or software owned or operated by the University;
  - (2) films, videos, multimedia works, typographical arrangements, field and laboratory notebooks, and other works created with the aid of university facilities;
  - (3) patentable and non-patentable inventions;
  - (4) registered and unregistered designs, plant varieties, and topographies;
  - (5) university-commissioned works not within (1), (2), (3), or (4);
  - (6) databases, computer software, firmware, courseware, and related material not within (1), (2), (3), (4), or (5), but only if they may reasonably be considered to possess commercial potential; and
  - (7) know-how and information associated with the above.
7. Notwithstanding section 6 of this statute, the University will not assert any claim to the ownership of copyright in:
  - (1) artistic works, books, articles, plays, lyrics, scores, or lectures, apart from those specifically commissioned by the University;
  - (2) audio or visual aids to the giving of lectures; or
  - (3) computer-related works other than those specified in section 6 of this statute.
8. For the purpose of sections 6 and 7 of this statute, 'commissioned works' are works which the University has specifically employed or requested the person concerned to produce, whether in return for special payment or not, but, save as may be separately agreed between the University Press and the person concerned, works commissioned by the University Press in the course of its publishing business shall not be regarded as 'works commissioned by the University'.
9. Council may make regulations:

- (1) defining the classes of persons or naming individuals to whom section 5 (1) (c) of this statute shall apply;
  - (2) requiring student members and such other persons as may be specified in regulations to sign any documents necessary in order to give effect to the claim made by the University in this Part and to waive any rights in respect of the subject-matter of the claim which may be conferred on them by Chapter IV of Part 1 of the Copyright, Designs and Patents Act 1988; and
  - (3) generally for the purposes of this Part.
10. This Part shall apply to all intellectual property devised, made, or created on or after 1 October 2000 and is subject to the provisions of the Patents Act 1977.

# Department of Materials - Map of Central Site

- ➔ Reception
- ① Hume-Rothery Building
- ② Holder Building
- ③ Engineering Technology Building
- ④ 12/13 Parks Road
- ⑤ 21 Banbury Road
- ⑥ Rex Richards Building
- ⑦ Information Engineering Building





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