Teaching Assistant Briefing

Megan Carter & Ben Jenkins

(Slides Adapted From Dr Lewys Jones & Dr Tim Davies)
Overview

• Undergraduate labs in Materials Science
  – Important people
  – Purpose
  – Schedules
  – Groupings
  – Topics

• The role of the Teaching Assistant
  – What it is
  – What it isn’t

• Some advice

• Possible UG lab scenarios
Ice Breaker

- Who are we?
- What teaching experience do we have?
The Purpose of UG Labs

- Labs provide essential training in practical scientific skills, conducting work independently from written instructions and report writing.

- Labs support the academic lecture course series throughout the year.

- Labs are EXAMINED coursework towards either Preliminary or Final exams.
## Undergraduate Degree Structure

<table>
<thead>
<tr>
<th>Component</th>
<th>Mark</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS1: Physical Foundations of Materials</td>
<td>100</td>
<td>Written Summer ‘Prelims’ Exams</td>
</tr>
<tr>
<td>MS2: Structure &amp; Mechanical Properties of Materials</td>
<td>100</td>
<td>Written assessment: report and coding</td>
</tr>
<tr>
<td>MS3: Transforming Materials</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Y1 Maths for Materials Science</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Computing for Materials Science</td>
<td>25</td>
<td>Written assessment during classes</td>
</tr>
<tr>
<td>Crystallography</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Practical Labs</td>
<td>50</td>
<td>Written assessment: 2 reports and 8 lab notebooks</td>
</tr>
<tr>
<td><strong>Prelims Total</strong></td>
<td><strong>500</strong></td>
<td></td>
</tr>
<tr>
<td>GP1: Lifecycle, Processing &amp; Engineering of Materials</td>
<td>100</td>
<td>Written Summer ‘Finals’ Exams at end of 3rd year</td>
</tr>
<tr>
<td>GP2: Electronic Properties of Materials</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>GP3: Mechanical Properties of Materials</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>GP4: Structure &amp; Thermodynamics of Materials</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Practical Labs</td>
<td>60</td>
<td>Written assessment: 3 reports and 7 lab notebooks</td>
</tr>
<tr>
<td>Industrial visits and talks</td>
<td>10</td>
<td>Written assessment: 4 IV reports &amp; 2 ‘talks’ reports</td>
</tr>
<tr>
<td>Entrepreneurship coursework</td>
<td>20</td>
<td>Written assessment: group report</td>
</tr>
<tr>
<td><strong>Part I Total</strong></td>
<td><strong>800</strong></td>
<td></td>
</tr>
<tr>
<td>Materials Options Paper 1</td>
<td>100</td>
<td>Written Summer ‘Finals’ Exams at end of 3rd year</td>
</tr>
<tr>
<td>Materials Options Paper 2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Team Design Project</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Introduction to Modelling in Materials</td>
<td>30</td>
<td>Written assessment: report</td>
</tr>
<tr>
<td>Characterisation or Atomistic Modelling module</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Part I Total</strong></td>
<td><strong>800</strong></td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td><strong>Overall Total</strong></td>
<td><strong>1200</strong></td>
<td></td>
</tr>
</tbody>
</table>
Important People

• Prof Sergio Lozano-Perez – Practical Class Coordinator

• Diana Passmore – Practical Class Technician

• Senior Demonstrators

• The Students (≈40 each year)

• Other Teaching Assistants

• Paul Warren etc. – Departmental IT
  – itsupport@materials.ox.ac.uk
UG Labs Schedule

• First year UGs:
  – Thursday & Friday 14:00 – 17:00 alternate weeks (MT & HT)*
    *Excluding some introductory labs in MTwk1 & MTwk2
  – PLUS two afternoons (assorted days) in the first half of TT

• Second year UGs:
  – Monday – Wednesday afternoons alternate weeks*
    *Except Trinity term which has a special timetable

• Teaching Assistants should aim to arrive at least 10 minutes before the start of labs

• Labs may not happen in the same order as previous years
UG Lab Groups

• Students work in groups of two or three

• Generally grouped by college but not always

• Designed to encourage and teach teamwork

• Will undoubtedly include a mixture of abilities, personalities, approaches, genders
UG Lab Topics – Year 1

- Practical 1P1a  Intro to Computing
- Practical 1P1b  Intro to Optical Microscopy
- Practical 1P2  Intro to LabView
- Practical 1P3  Young’s Modulus & Stress Analysis
- Practical 1P4  Metallography
- Practical 1P5  Polymers - Molecular Weight Effects
- Practical 1P6  Thermal Analysis
- Practical 1P7  Bubble Raft
- Practical 1P8  Electrode Potentials
- Practical 1P9  Energy Levels and Band Gaps
- Practical 1P10  Fabrication & Tensile Testing

http://www.materials.ox.ac.uk/teaching/ug/ugpracticals.html
UG Lab Topics – Year 2

- Practical 2P1  Materials Selection
- Practical 2P2  Steels
- Practical 2P3  Extrusion
- Practical 2P4  Casting
- Practical 2P5  Diffusion
- Practical 2P6  Dislocations and Plasticity
- Practical 2P7  Corrosion
- Practical 2P8  Mechanical Properties of Polymers
- Practical 2P9  XRD Detective
- Practical 2P10  SEM and Fracture
- Practical 2P11  Transmission Electron Microscopy
- Practical 2P12  Semiconductor Devices

http://www.materials.ox.ac.uk/teaching/ug/ugpracticals.html
What makes an effective educator?

- Patience
- Communication
- Organisation
- Punctuality
- Leadership
- Teamwork
- Assertive(?)
- Knowledge
- Adaptability
- Passion
- Punctuality

How about effective demonstrators?

How about bad teaching?
The Role of the Senior Demonstrator

• To write lab handout for the students to follow

• To introduce and explain the relevance of the lab

• To tell the students the key deliverables they are looking for

• To instruct the TAs if there are special themes they want highlighted by the students

• To be around in the labs to answer academic questions, around an average of one hour per day (not fixed)

• To read and mark the written reports and lab notebooks
  – The marking method is now displayed on a chart outside the labs.
The Role of the Teaching Assistant is... (1)

- To familiarise themselves with the practical and the equipment in advance of the lab session, including reading the online handout
- (For new TAs) doing a practice run of the lab
- To oversee delivering the SDs requirements
- To assist the PCT in encouraging safe, respectful and professional behaviour in the labs
- To assist the PCT in concluding the labs in a timely fashion
- To answer reasonable questions from students
What are reasonable questions?

- “What should we do first?”
- “Is one measurement enough?”
- “We are unsure if we have set up our testing equipment properly, please could you check?”
- “Do these results look right to you?”

What should you do if you are asked a question that you don’t know the answer to?
The Role of the Teaching Assistant is... (2)

- To assist students in becoming effective experimental scientists with:
  - proper lab discipline, behaviour and time management
  - effective team-work and communication skills
  - correct use of lab notebooks (these are marked so should be used)
- To assist students with experimental equipment
- To develop themselves in their communication and teaching skills.
The Role of the Teaching Assistant is not...

- To give students the ‘answers’ to the lab
- To do any work for the students or tell the students how to approach the tasks
- To tell them if they’ve gotten something ‘right’ or ‘wrong’
- To earn some quick money by baby-sitting a group of young-adults / to catch-up on reading
- To spend the session on their phone (lab rules apply to the TA too!)
A few words of advice

• Make sure to spend time getting familiar with your practical(s)
  – It is much easier to deal with problems if you understand the practical and apparatus!
  – You get paid for the training time!

• Be proactive and talk to all the groups regularly
  – This often helps to identify problems before they arise
  – Also builds relationship where they are more comfortable approaching you if they need help
  – Enjoy yourself!
Possible UG Lab Scenarios (1)

- A student doesn’t understand the handout’s instructions
- You see someone copying / cheating
- An accident / near miss occurs
- A student is in the IT room completing tute-work for a deadline
- A student leaves the lab unannounced to go smoke / to the vending machines
- You see a student about to do something without the required PPE
Possible UG Lab Scenarios (2)

- One person in a group is doing no work
- One person in a group is doing all the work
- A student is checking emails / listening to music / playing with a smart-phone in the lab
- You think a student / group are rushing their work just to leave early
- Several groups in the lab all need help at the same time
- You see a group doing the practical / analysing their data incorrectly
Real Scenario (1)

• You are approaching the end of day two of a three day lab. You have concerns that one group will struggle to finish on time. They have taken multiple measurements for 2 out of 5 samples, but have not yet taken any measurements on the other three samples. They seem more concerned with taking multiple measurements for each sample.

• What would you do?
Real Scenario (2)

During the initial planning meeting with the SD, it becomes clear that an essential piece of apparatus for your practical is irreparably broken. The SD suggests changing to an entirely new practical, using a different piece of equipment, but it is one that hasn’t been run for many years.

What would you do?
Thank you for listening

ANY QUESTIONS?