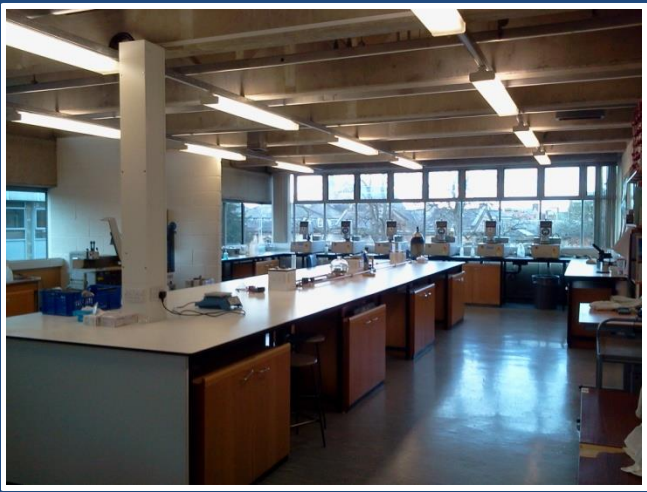
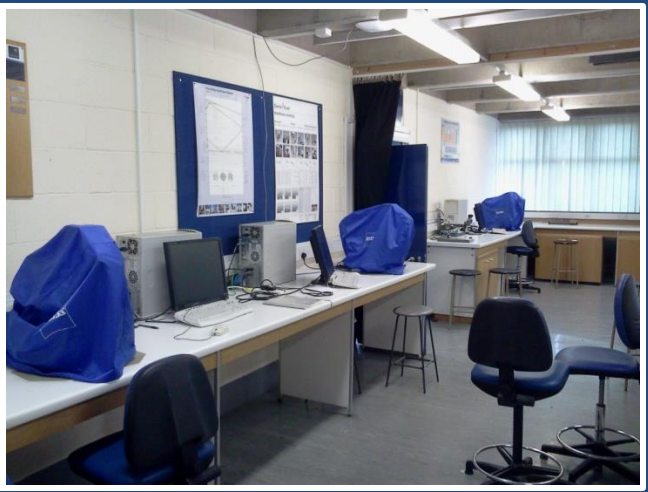
Teaching Assistant Briefing





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

OxfordMaterials

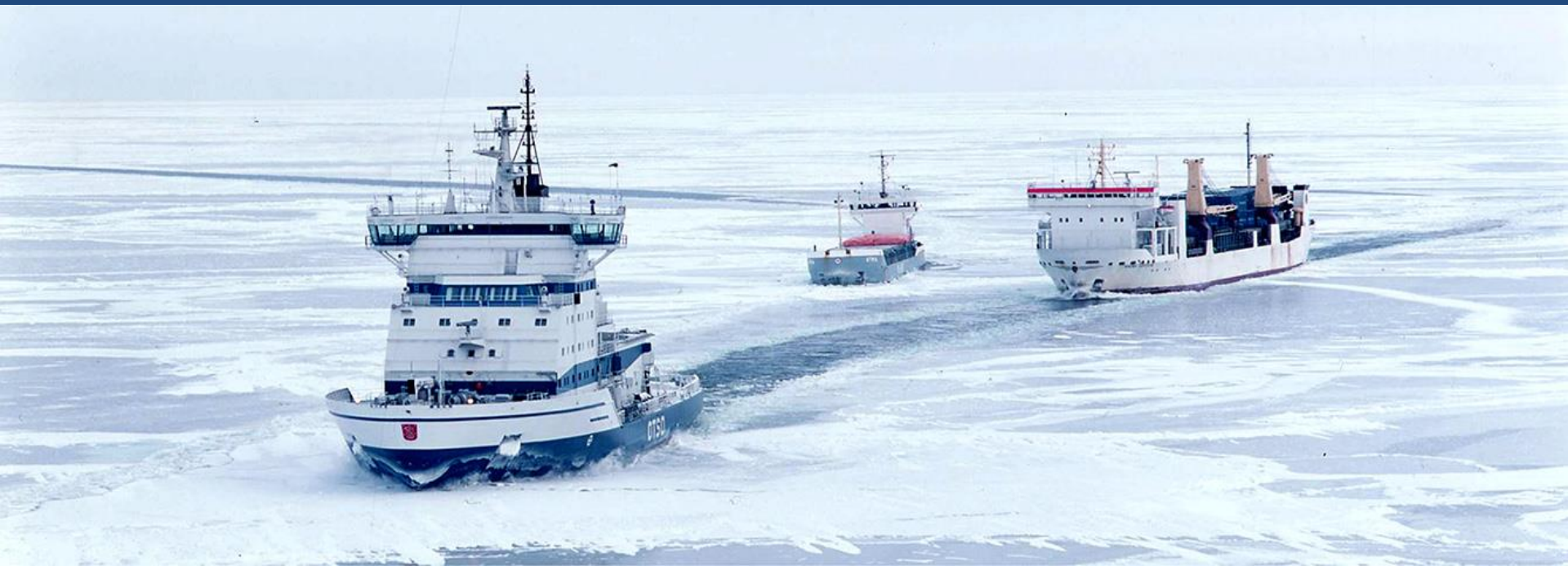
UNIVERSITY OF OXFORD

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

	Component	Mark	Assessment
Y1 (Prelims)	MS1: Physical Foundations of Materials	100	Written Summer 'Prelims' Exams
	MS2: Structure & Mechanical Properties of Materials	100	
	MS3: Transforming Materials	100	
	Y1 Maths for Materials Science	100	
	Computing for Materials Science	25	Written assessment: report and coding
	Crystallography	25	Written assessment during classes
	Practical Labs	50	Written assessment: 2 reports and 8 lab notebooks
Prelims Total		**500**	
Y2 (Part I)	GP1: Lifecycle, Processing & Engineering of Materials	100	Written Summer 'Finals' Exams at end of 3rd year
	GP2: Electronic Properties of Materials	100	
	GP3: Mechanical Properties of Materials	100	
	GP4: Structure & Thermodynamics of Materials	100	
	Practical Labs	60	Written assessment: 3 reports and 7 lab notebooks
	Industrial visits and talks	10	Written assessment: 4 IV reports & 2 'talks' reports
	Entrepreneurship coursework	20	Written assessment: group report
Y3 (Part I)	Materials Options Paper 1	100	Written Summer 'Finals' Exams at end of 3rd year
	Materials Options Paper 2	100	
	Team Design Project	50	Written assessment: group report
	Introduction to Modelling in Materials	30	Written assessment: report
	Characterisation or Atomistic Modelling module	30	Written assessment: report
Part I Total		**800**	
Y4 (Part II)	Thesis	400	
Overall Total		**1200**	

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?

Assertive(?)

Organisation

Patience

Knowledge

Adaptability

Passion

Leadership

Communication

Punctuality

Teamwork

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 student 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?