

# Laboratory Classes



Laboratory work is a prominent feature of education in Science and Technology based subjects. In the laboratory students can explore their understanding of the subjects being taught by placing their learning in context. Good laboratory and practical work can also help students develop expertise in critical enquiry, problem solving, experimental design, data analysis and presentation, and a long list of important academic and professional abilities. Students can also be motivated to learn in the laboratory context if they can feel a spirit of excitement when investigating a scientific phenomenon, or when creating something that actually works. Students will tend to remember an occasion where a laboratory class was particularly enlightening, although may also remember many hours of tiresome exercises which seemed to teach them very little.

The National Subject Profile (NSP) in Materials<sup>1</sup> has shown that laboratory classes account for an average of 4-5 hours per week for the typical Materials programme and so it is important that this mode of delivery is designed to motivate the student and to contribute towards effective student learning. The NSP also revealed that Materials graduates were sceptical about the usefulness, in employment, of the laboratory skills they had developed so a re-appraisal of laboratory classes might be appropriate in some programmes.

## Resources

There is a good website produced by Glasgow Caledonian University and The Robert Gordon University which details 'How to organise laboratory work' (available at <http://apu.gcal.ac.uk/ciced/Ch09.html#1>) and a further chapter on 'Assessing laboratory work' (at <http://apu.gcal.ac.uk/ciced/Ch27.html>). Both give details relating to technical laboratory work along with some useful case studies.

A paper entitled 'The role of laboratory work in engineering education: Student and staff perceptions', reviews current literature on laboratory practice and suggests some strategies which may lead to laboratory work becoming more an effective learning technique.<sup>2</sup>

<sup>1</sup> National Subject Profile in Materials at [www.materials.ac.uk/subject-profile/report.asp](http://www.materials.ac.uk/subject-profile/report.asp)

<sup>2</sup> The role of laboratory work in engineering education: Student and staff perceptions Norrie, Edward S International Journal of Electrical Engineering Education, Jan 2002.

## How can we help?

### UKCME can help by:

- Putting you in contact with one or more staff at UK universities who currently deliver Materials laboratory classes;
- Offer guidance and/or teaching development grants to develop a Materials laboratory class;
- Running an awareness-raising workshop in your Department, Faculty, School or College.

### Contact Us:

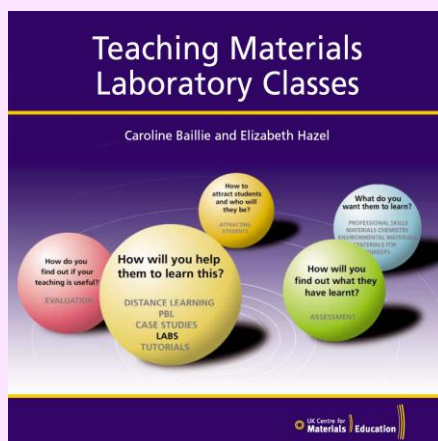
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## Higher Education Academy Resources

- There is a practical guide published by the UKCME, entitled '*Teaching Materials Laboratory Classes*' which explains the importance of laboratory work in Science and Technology. It suggests ways in which students can be motivated in a laboratory environment, provides ideas on how to design a laboratory or practical class in Materials and covers modes of assessment and how to minimise fraudulent practices.



The guide explains that there are several different ways of presenting laboratory work each differing in purpose. In order of decreasing teacher control and increasing student autonomy, these are controlled exercises, experimental investigations and project work. It describes the relative merits and drawbacks of each, alongside examples of good and bad practice.

This guide, one of a set of 12 guides developed by the UKCME for Materials lecturers, is available online at <http://www.materials.ac.uk/guides> The 12 guides are also available as a boxed set and can be sent out on request (please note that there are a limited number of boxed sets available).