

## **Helping students and lecturers manage with visual impairment in Materials Science**

The following information has been designed to link current guidelines and practical experiences, bringing awareness to the requirements of a department for visually impaired students who wish to study materials science at university. This guide summarises the information available and is aimed at both students and lecturers with links to websites and guidelines.

### **1. Preparation**

#### *For the department*

If there has not been a visually impaired student in the department before, certain guidelines must be met before they arrive (if they have not already), such as painting the edges of all steps and verifying emergency exit routes. It is useful to discuss these changes with the student as they can add information.

Further details can be found in the Code of practice for the assurance of academic quality and standards in higher education Section 3: Students with disabilities (October 1999)

(<http://www.qaa.ac.uk/academicinfrastructure/codeOfPractice/section3/default.asp>)

The HEFCE website gives access to the full report on: Disability statements: A guide to good practice. [http://www.hefce.ac.uk/pubs/hefce/1998/98\\_66.htm](http://www.hefce.ac.uk/pubs/hefce/1998/98_66.htm)

*Online materials for staff disability awareness*, A project funded by HEFCE, a good base for academic staff looking for information on disabilities, from open days to course modules. <http://jarmin.com/demos>

The Engineering Subject Centre website has a section dedicated to disabilities with guidelines and resources <http://www.engsc.ac.uk/er/dis/index.asp>

The National Disability Team provides information on HEFCE funded projects and guidelines, and is useful for anyone who may support a disabled student <http://www.natdisteam.ac.uk>

### ***For the student***

The welfare and advisory services, available at every UK University, are on hand to offer support to you; this ranges from orientation of the campus and finding note takers, to applying for disabled student allowance and finding accessible accommodation. It is beneficial for you to contact welfare and advisory services before you start your studies, so that everything can be put into place in time for the start of the semester. You may want to give some advice to your prospective department on any changes that need to be made from previous experiences so they can accommodate you to their fullest (they may only have guidelines to go by, not personal experiences).

#### Further information

The RNIB education homepage is aimed at blind / visually impaired students in post sixteen education. It covers everything from students' rights, to how to make friends and study methods. <http://www.rnib.org.uk/student>

The National bureau for students with disabilities, information on higher and further education in the UK. <http://www.skill.org.uk>

*Action for blind people*, their website gives general information. <http://www.afbp.org>

## **2. Lectures**

### ***For the department***

Cooperation and understanding of the teaching staff is one of the most important factors during a student's time at the University. It is often a learning experience for the lecturer, as you may have to alter the way in which you teach, you must make the student is aware of what is to be learnt, and it cannot be solely visual. After talking to a visually impaired student, it was found that the most useful action taken by one lecturer was to give out an enlarged copy of the entire course notes before the semester had started.

A summary of points on how to accommodate a visually impaired student is shown below. Remember that this list is general and it is always best to discuss with the individual to find out what suits them:

- Make a booklist available before course starts and prepare glossaries of terms and acronyms.
- Provide lecture notes in advance in large print or electronic form (including diagrams).
- Stand in a well-lit place – not directly in front of a window, as your face will be in shadow.
- Keep background noise to a minimum.
- Explain at beginning of lecture what the structure/main points will be, speak clearly and summarise frequently.
- Give clear, precise instructions stating what is to be noted.
- Allow the use of tape recorders.
- Make all written material clear and simple with a strong contrast to the background.
- Keep pictures/diagrams to a minimum or provide text /audio alternatives
- Explain visual material verbally.
- Allow submission of assignments by email

A more comprehensive list can be found in the Basic guidelines for tutors and lecturers, prepared by the learning support team at APU (Anglican Polytechnic University), ([http://www.apu.ac.uk/stu\\_services/essex/learningsupport/Tutor-VisImpaired02.htm](http://www.apu.ac.uk/stu_services/essex/learningsupport/Tutor-VisImpaired02.htm))

### *For students*

Note takers can be very important to your studies, and it is imperative that they are reliable and know what they are undertaking. If you feel you have a problem with a note taker, try and talk to them; if that doesn't work, talk with the welfare and advisory services as it is their responsibility to provide you with a reliable person. Find out if you are eligible for computer equipment and apply for the disability grants available, again welfare and advisory services are there to help you for this. Other links below such as RNIB, who have a site specifically for students, may be useful. As you are probably aware, there are speech and enlargement computer programs available, such as *Supernova*. This program is very good, but reaches its limits when working with engineering specific software such as *Math Cad* and finite element software; it may also read out *PowerPoint* text in the wrong order, however future versions are likely to be improved.

There are programs available to translate equations into *Nemeth* code (Brail form of maths) for example [MAVIS](#), which is being developed so that the software will translate *Nemeth* code into standard text as well. If you use *Nemeth* code this could prove very useful as a communication between the lecturer and yourself where maths is involved. The *Texas School for the Blind and Visually Impaired* have set up a web site to share all their information (with links); they also have a section specifically for maths, which has downloads to teach *Nemeth* code.

### Further information

[MAVIS](#) Mathematics Accessibility to Visually Impaired Students is a project set up by New Mexico State University, allowing lecturers to translate their material to create *Nemeth* code quickly for their students. Contact to the group can be found at <http://www.rit.edu/~easi/nsfppd/9800209.htm>

Texas School for the blind and visually impaired have carried out a lot of work and research into visual impairment. Although legislations are not for this country, there are case studies and addresses for manufacturers of study aids etc, most of who have web addresses. Their web address is <http://www.tsbvi.edu/>

<http://www.cueandreview.org.uk/index.html> an organisation that provides over 22 magazines and newspapers on audio tape free of charge for the visually impaired.

<http://www.washington.edu/doi/Resources/science.html> An American site from the University of Washington with links to educational resources for students with disabilities for science and engineering.

### **3. Lab classes**

#### ***For lecturers/demonstrators***

As a lecturer, you should identify any areas of the practical, which may cause difficulty or be hazardous to a visually impaired student, such as, handling chemicals, specimen preparation, microscopy etc. With these in mind, solutions must be found with which both the demonstrator and student are happy. To install constancy, it may be useful to discuss any difficulties that may occur frequently with the student when they first arrive, to see how they would like to overcome them, such as an enlarged T.V. screen for the microscope. The demonstrator must give a very good aural description and explain all diagrams clearly. If the students work in groups, it may not be necessary for the visually impaired student to handle chemicals. Practical/project work that is carried out in groups can be advantageous for all students increasing the learning outcomes for everyone, as the environment can be designed to promote discussion and support between peers. This will build on teamwork skills and confidence at the same time as reducing potential risks that may occur if a visually impaired student were to work alone. Group work such as problem-based learning is also beneficial for the same reasons.

#### ***For students***

In your lab classes, a postgraduate will be available to describe the experiment to you. If you have limited sight, images can be enlarged on T.V. screens and the contrast increased, for example in metallography, a postgraduate will be able to describe the images, making them clearer. If this is not a feasible option for you, examples of such work may be made up into tactile diagrams (e.g. different phases in a metal) prior to the lab. However, for practical work, you may have to rely on an aural description, as the experimental results can often be too detailed for tactile diagrams.

Further information

Information on tactile diagrams may be found at <http://www.nctd.org.uk>, the *National Centre for Tactile Diagrams*.

*Online Training on Accessible Information Technology for Persons with Disabilities* gives information on tactile graphics, (design of etc), social barriers and lab equipment, among a few. <http://www.rit.edu/~easi/easisem.htm>.