The Accessible Electronics Lab

Lab Accessibility for Disabled Students

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Why is Lab Accessibility Important?

The Disability Discrimination Act requires schools, universities and colleges not to discriminate against disabled students and to make reasonable adjustments.

Laboratories are an integral part of all engineering courses. Therefore they have to be accessible to all students and reasonable adjustments should include making laboratories accessible and not excusing disabled students from them. Adjustments to make laboratories more accessible to disabled students generally benefit all students and staff.

Making laboratories accessible increases the pool of talent that can be attracted into the engineering profession. Many disabled people have had to exercise a lot of ingenuity to cope with an inaccessible world. The engineering profession could benefit from this ingenuity.

Teaching Aims

All teaching aims and objectives should be relevant and necessary and available in a clear form to students. Disabled students can be disadvantaged by the imposition of unnecessary aims and objectives.

- Changes in technology may have an impact on course aims and objectives. For instance students are often required to draw by hand and analyse graphs. This can disadvantage blind students and students with limited fine motor skills. Requiring students to produce graphs with a software package and analyse them would not disadvantage disabled students.
- Modify course aims which could discriminate against disabled students without losing the key learning aims. This may require coordination with accreditation bodies.
- Take advantage of software packages and hardware which allow students to achieve the same aims in different ways.

Location

- The location, layout, timing and organisation of labs will affect whether disabled students are able to participate at all and the quality of their learning experience.
- Wheelchair access to the building should preferably be by the same entrance that everyone else uses. Doors should be easy to use e.g. automatic or with handles at an appropriate height for wheelchair users and not too heavy. Ideally a wheelchair accessible toilet should be close to the laboratory.
- Labs should either be on the ground floor or accessible by lifts with spoken announcements and tactile signage.
- Use good signage, including Braille and large print.

Equipment

- Use up-to-date equipment and a standard design where possible. Having to learn to use 3 different types of oscillator could be confusing for some students.
- Make laptops available for writing up lab notes, calculations and analysis and producing a lab report. The majority of equipment should be connectable to an RS232 port so that results can be output to a computer for analysis or reading with screenreader or other text-speech conversion software.

- Check that all software packages used in the lab can be used with screenreaders. You may have to discuss upgrading screenreaders or modifying some engineering design packages with the manufacturers.
- Make appropriate assistive technology available to support disabled students, including non-slip work surfaces and gripping devices. There is a need for the development of a mobile assistive robot to be used in turning knobs, connecting cable and flicking switches.
- Use 'dynotape' Braille tape to mark cables and equipment.

Lab Environment

- Ensure that there is good lighting.
- Reduce background noise and overcrowding by avoiding timetabling several different classes in one lab space to keep down noise and avoid crowding in the lab.
- Ensure that there are sufficient demonstrators. All lab staff, including demonstrators and lab technicians, should have received training in disability etiquette and working with disabled students.
- Have a well-designed lab layout with sufficient space between the benches for wheelchairs.
- Some workbenches should be of adjustable height for wheelchairs.
- There should be sufficient space beneath benches for wheelchair users to sit right up close to the bench.
- Power points and all equipment should be in easy reach of seated users.

Timing and Preparation

Many disabled students experience considerable stress, may require longer to do labs than non-disabled students and may find long sessions difficult without a break.

- Try to schedule some flexibility into the lab timetable and allow for breaks.
- Provide all students with lab sheets in advance of the lab class to enable them to prepare. This has learning benefits for all students.
- Provide information about the lab and the equipment on the web.
- Organise lab introductory sessions where students can meet the technicians and demonstrators and be shown how to use all the equipment.

Key Points

Be proactive, not reactive.

Try to make all labs fully accessible rather than adapting them for particular students.

Listen to disabled staff and students.

Ensure the building is accessible and students can move easily round the lab.

Allow flexible timing for labs and the possibility of breaks.

Ensure equipment is mutually compatible and can be connected to computers for taking readings and analysis.

Rewrite your courses' aims and objectives to avoid unnecessary difficulties for disabled students.

Talk to your Estates and Buildings staff about accessibility. Many changes may be free or cheaper than you think. Some can be incorporated into planned maintenance or upgrades.

For more information contact Dr Marion Hersh, Department of Electronics and Electrical Engineering, telephone 0141 330 4906, email: m.hersh@elec.gla.ac.uk. Also available is the Engineering Subject Centre Guide *Working with Disabled Students*, available online at www.engsc.ac.uk/downloads/resources/disguide2ed.pdf or by telephoning 01509 227170.