About the series:
This is one of a series of peer reviewed booklets looking at various aspects of teaching and learning aimed at all those involved in engineering education. The complete series is also available on our website.

About the centre:
The Engineering Subject Centre is one of the 24 subject centres that form the subject network of the Higher Education Academy. It provides subject based learning and teaching support for all engineering academics in the UK.

The Centre’s Mission is:
to work in partnership with the UK engineering community to provide the best possible higher education learning experience for all students and to contribute to the long term health of the engineering profession.

It achieves this through its strategic aims: sharing effective practice in teaching and learning amongst engineering academics; supporting curriculum change and innovation within their departments and informing and influencing policy in relation to engineering education.
Author's biography

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Liz Willis has a degree in Industrial Design and Technology with Education. Since graduating she has worked for Loughborough University's Admissions and Accommodation departments and been a Design and Technology teacher; teaching 11-19 year olds. Liz has been working with the Engineering Subject Centre since 2002 and coordinates a number of the Centre's activities, including Teaching Awards, Mini-Projects, events calendar and the Assessment of Learning Outcomes in Engineering Working Group (ALOE).

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Interaction

We would like to hear your views and feedback on this publication to help keep the guide up to date.

There is an interactive version of the Guide, where you can comment on each paragraph individually, or on sections as a whole, this can be found at www.engsc.ac.uk/teaching-guides

How does it work?

To view a section, click the section name in the Table of Contents on the left. The paragraphs within the section are shown in one column, with a box on the right showing the comments which have been submitted by other readers. Next to each paragraph, there’s a small grey speech bubble. Click on this to bring up the comment form. Please abide by our moderation policy or your comment will not be published.

What happens next?

The feedback and discussion received will be reviewed by the Centre and author, and views and suggestions will be incorporated into new editions of the guide.

If you have any queries about this document or the process behind it, please contact us at enquiries@engsc.ac.uk
Enhancing the First Year Experience for Engineering Students

Overview
This guide aims to provide a starting point for those with responsibility for the recruitment and retention of first year engineering students and those who wish to contribute to enhancing the first year experience for their students.

The guide comprises a brief introduction to a number of key areas in considering the first year experience for engineers, followed by a series of suggested questions to facilitate discussions and to inform further work or activity. The guide ends with a reference list and further reading material is provided for the sections which include:

Pre-entry and induction; Providing a stimulating and supportive teaching and learning environment; Assessment; Mathematics; and Personal Development Planning.
**Introduction**

The first year is an important time for all students. It marks a new stage in their education, one where they have been given control of the decision of what and where to study. It is a chance for tutors to prepare them for their degree, and in turn the world of work, and to help them to become motivated, independent life long learners.

However, the pressures on students are numerous and many do not succeed. Engineering is a discipline where a combination of factors, including difficulty of the subject and mismatching of student and academic expectations, have resulted in higher drop out rates than for many other subjects (HESA, 2006). For 2004/2005 entrants HESA data shows that 23% of full-time students in the UK do not re-enrol for the second year of their engineering degree programme and it is important that departments take time to consider why this happens and how this situation could be improved.

During February and March 2006 the Higher Education Academy conducted a survey asking students about a variety of issues which had an effect on their first year experience. The First Year Experience Survey (Yorke and Longden, 2007), drew out five key factors of impact: a stimulating learning experience; supportive teaching; understanding academic demand; coping with the demands of higher education and feedback. Of these, engineering and technology students placed value on being provided with a stimulating and supportive learning experience. It is reassuring to note that the National Student Survey\(^1\) results for 2005 (HEFCE, 2005)

\(^1\) The aim of the National Student Survey (NSS) is to gather feedback on the quality of students’ courses, to help inform the choices of future applicants to higher education and is funded by HEFCE. Results are published on the Teaching Quality Information website [www.tqi.ac.uk](http://www.tqi.ac.uk)
suggested that engineering students, on average, found their courses to be intellectually stimulating and that, as a result of the course, they felt that their communication skills had improved and that they were confident in tackling unfamiliar problems.

The Higher Education Academy First Year Experience Survey found that “the likelihood of withdrawal was considerably affected by two key factors: students’ prior knowledge of their institution and their course, and how stimulating they felt their teaching to be”. However, it is likely that there will be no single reason why students leave university (Yorke, 1999) and it is “important to conceptualise student progression as a series of interrelated processes” (Shobrook, 2003). Each student and their experiences will be unique but, by developing activities which help students to integrate into the academic and social framework at their institution and through developing resources and support to help students cope with the demands of the course, more students will share a good first year experience. Watson (2006) argues for a “consultative, research-based, approach to what students really want and need” and this guide aims to provide support for considering how teaching and learning strategies within departments may help to provide the best possible experience for students in their first year and hence increase the likelihood that they will go on to successfully complete their degree.
The Higher Education Academy first year experience literature review highlighted social and academic integration as one of the main theories in this area.

“Students withdraw from the first year if they feel they are not integrated............. One clear message from the literature is that no model fits all situations”. (Harvey, 2006).

This guide aims to highlight teaching and learning approaches and interventions which have been of benefit to first year students within engineering departments. References are given to provide additional information on areas which may be appropriate to a specific departmental context.

Pre-Entry and induction audit
In focus groups on their experience during the first year, engineering students highlighted the first few weeks of term as being key to finding their way around, meeting new people and finding friends (Engineering Subject Centre, unpublished). They valued opportunities to facilitate social networking such as group and project work, “you get to know people, because you’re working in groups rather than sat in lectures”. Benefits of induction activities were also seen by tutors as well as students: “I saw more of my tutees than usual, so now they are more inclined to approach me and chat in my office”.

enhancing the first year experience for engineering students
Engineering students tend to take a pragmatic approach to seeking support. For subject related enquiries students were much more likely to turn to peers or the relevant module tutors: “It’s the only way really”. If bonds between students are most likely to be formed early on in degree programmes and peers form part of a key support network then planned activities within induction week and the first semester could have an impact on retention.

Table 1 provides a series of questions aimed to help academics to reflect on the induction activities employed by a department. They are designed as a prompt to facilitate thinking about a student’s first impressions and the activities which could be developed to help them feel comfortable within their department and institution. It may be useful to involve all those responsible for the departmental induction schedule in the reflection.
## Table 1. Pre-entry and induction

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the course publicity clearly indicate what students may expect from the course?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>2. Does the course information clearly provide material on content, learning outcomes, and employability prospects?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>3. Are the expectations required of students clearly emphasised?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>4. Does your department have a clear induction strategy for students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>5. Do students receive an induction pack?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>6. Do students get shown around the department and its facilities?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>7. Is there an opportunity for students to take part in a practical activity in week 1? e.g. do the students undertake an engineering task?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>8. Are measures taken to encourage students to interact through a social activity in the first few days of the course?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>9. Are students asked to work in small groups during the first week of the semester?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>10. Is an individual member of staff assigned to each group as a facilitator?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>11. Are measures taken to identify whether students from under-represented groups e.g. women or ethnic minorities, are comfortable in the environment created within the department?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>12. Are existing students involved in the induction process?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>13. Is interaction with student support offices/centres part of departmental practice?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>14. Are departmental staff involved with induction to the ancillary services, e.g. to the library and computing facilities?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>15. Are induction strategies confined to the first week of classes or do they continue throughout the first semester/year?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>16. Do you have a personal tutor(^2) scheme?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>17. Do students get to meet their tutor in the first week?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>18. Does your department offer staff training on pastoral care?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>19. Are induction activities evaluated by the students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>20. Have changes been made to induction practice because of feedback?</td>
<td>Yes/No/Not sure</td>
</tr>
</tbody>
</table>

\(^2\) A scheme where a member of staff is responsible for a particular student’s pastoral care which could include, for example, following up on academic performance, supporting PDP and providing references.
enhancing the first year experience for engineering students

Where next?


- The SPAT (Student Progression and Transfer) FDTL project produced a series of resources to support staff involved with the progression of students on to top-up degree programmes. Whatever the background of your students, the materials aim to raise student awareness of the expectations of higher education. www.SPAT.ac.uk

- The STAR (Student Transfer and Retention) project aimed to identify the purpose of induction and introductory activities and provide examples of good practice. www.ulster.ac.uk/star/


- Napier University’s Student Retention Project (SRP) was established in 1994 to research, understand and address student retention issues for undergraduates. This site pulls together a wide range of internal and external resources for staff and researchers interested in improving the student experience and enhancing student success, including diagnostic tests to establish entry point risk factors. staff.napier.ac.uk/Services/QES/Student + Retention/Student + Retention + Project/
Providing a stimulating and supportive teaching and learning environment

Curriculum Design for the First Year Literature Review (Bovil, Morss & Bulley, 2007) highlights evidence of “issues relating to assessment, schedules and perceptions of connectedness” as affecting student engagement.

The Engineering Subject Centre Teaching Awards provide an opportunity for teachers to receive national recognition for outstanding learning and teaching practices. All finalists are given the opportunity to demonstrate their work to a member of the Subject Centre team which includes the collection of student feedback. This information is summarised in Case Studies available from www.engsc.ac.uk/an/teaching-awards/ . Through the Teaching Awards a number of focus groups have been run with engineering students regarding curriculum interventions. Students appreciated approaches aimed at providing links between theoretical academic work and practical challenges in engineering that “allows you to see how an engineer would think” and “encourages you to get on with the basics”. The use of real life situations helped students to learn the theory, commenting that the approach offered a “more natural way of learning so you [the students] remember it better.” Students reflected on the benefit of being involved in activities, commenting that it was all too easy to “switch off” during lectures, in the knowledge that notes could be read at a later date, whereas “interacting with stuff this way – it’s going to stick.”

Essays submitted to the Engineering Subject Centre Student Awards (2004-5) on ‘What makes the best learning experience for an engineering student?’
enhancing the first year experience for engineering students

highlighted “interactive learning experiences, be that lab work, design projects, site visits, field trips or work placements”, “getting things wrong…especially when you have a chance to fix your mistakes” and the “ability to observe and process a situation” as being some of the best learning experiences for engineering students. “Actually ‘doing’ engineering” and “the sense of achievement I get from solving problems” were offered as the reasons as to why students love engineering. Table 2 provides questions to prompt reflection on teaching and learning environments.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does your department encourage the use of a variety of teaching methods?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>2. Do you invite speakers from industry or visiting professors to present to or work with first year students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>3. Do you use technology to enhance areas of curriculum?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>4. Does your department have a VLE or MLE for you to use to support your module?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>5. Are mathematical theories linked to engineering problems?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>6. Does the curriculum include new hot topics (e.g. ethics or sustainable development)?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>7. Are there opportunities to offer discipline specific examples within common programmes?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>8. How many practical activities are offered in the first semester?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>9. Are students given the opportunity to work in teams?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>10. Are student discussions facilitated formally through a module in the first year?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>11. How do you keep your students motivated?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>12. Do you run departmental or national competitions?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>13. Do modules include opportunities to receive formative feedback early on in the course?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>14. Are students given an opportunity to successfully solve a problem?</td>
<td>Yes/No/Not sure</td>
</tr>
</tbody>
</table>
Assessment
Assessment defines what students regard as important, how they spend their time and how they come to see themselves as students and then as graduates. It is a major concern of those who learn, those who teach and those who are responsible for the development and accreditation of courses (Brown, 2001).

The First Year Experience in Higher Education Survey noted negative responses from engineering students regarding feedback. In particular, the level of detail of the feedback they received was not always helpful in clarifying things they did not understand. Studying engineering and technology is also highlighted as one of the factors likely to lead to a low score for assessment and feedback in the National Student Survey. In focus groups on their experience during the first year, engineering students focussed on wanting constructive feedback on which they could reflect. “What did I do wrong? What did I do right? I would love to see what could be improved and what is good”. “…you want to make sure the next one [grade] is better”.

The questions in Table 3 could help a department identify the areas through which assessment and feedback practices are influencing retention rates and highlight possible actions to improve the experience for students.
### Table 3. Assessment

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What formative assessment strategies do you employ in your classes?</td>
<td></td>
</tr>
<tr>
<td>2. What summative assessment strategies do you employ in your classes?</td>
<td></td>
</tr>
<tr>
<td>3. Within the modules you teach are assessment criteria clearly written and available to students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>4. Are the links between the assessment and the module learning outcomes made clear to students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>5. Does your assessment reward success or penalise mistakes?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>6. Do your students receive feedback on all assessed work?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>7. Does feedback given relate to the learning outcomes of the module?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>8. In your modules do you use computerised forms of assessment with automatic marking and feedback?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>9. Do you use commercial virtual learning environments (e.g. Blackboard, Questionmark Perception) for assessment purposes?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>10. What other opportunities do you utilise for providing students with feedback on their progress?</td>
<td></td>
</tr>
<tr>
<td>11. How are poor results followed up?</td>
<td></td>
</tr>
<tr>
<td>12. What follow up support is offered (e.g. additional tutorials, use of mentors)?</td>
<td></td>
</tr>
<tr>
<td>13. Are individual academics aware of assignment deadlines for all first year modules?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>14. Are measures taken for students to understand their own academic performance?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>15. Do you gather feedback from students on assessment methods within your module?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>16. Has feedback resulted in any recent changes?</td>
<td>Yes/No/Not sure</td>
</tr>
</tbody>
</table>
Where next?
For additional resources on assessment visit the resources section of the Engineering Subject Centre website at: www.engsc.ac.uk/er/assessment/

Resources include:


- Formative Assessment Strategies. Progress Guide No 4 which includes case studies of how formative assessment may be used to motivate students and in turn improve retention rates. www.hull.ac.uk/engprogress/


- The Higher Education Academy Student Enhanced Learning through Effective Feedback (SENLEF) project is a resource for practitioners wishing to improve their feedback practice or get some exciting new ideas. Further information on the project and resources produced are available from www.heacademy.ac.uk/ourwork/learning/assessment/senlef.
Mathematics

In June 2000, the Engineering Council (UK) recommended to all universities in their report *Measuring the Mathematics Problem* (Hawkes & Savage, 2000) that students embarking on mathematics-based degree courses should have a diagnostic test on entry and that prompt and effective support should be available to students whose mathematical background is found wanting by these tests.

The Engineering Subject Centre report *Responding to the Changes in the Teaching and Learning of Mechanics in Schools* (Robinson, Harrison & Lee, 2005) provided information about the changes in A-level mathematics and the research confirmed that many engineering students start university with a limited knowledge of mechanics. It also found that a significant number of schools no longer offer mechanics as part of their mathematics courses. Engineering mathematics is a key area of all engineering degree courses and the changes to the A-level mathematics syllabus mean that many departments and institutions are having to develop strategies to support their students in mathematics. Table 4 provides a shortlist of themes to consider.
Table 4. Mathematics

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are prospective students made fully aware of the mathematics component of the course?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>2. Has your department reviewed the first year mathematics curriculum following changes to the school mathematics curriculum?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>3. Do new students undertake a maths diagnostic test?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>4. Does the department offer maths support?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>5. Are maths tutorials offered?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>6. Are you or your students aware of maths support resources available nationally?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>7. Are the maths courses subject-specific or are the maths components taught in context?</td>
<td>Yes/No/Not sure</td>
</tr>
</tbody>
</table>
Where next?

- **mathcentre** is the web-based UK Mathematics Learning Support Centre and has been set up to deliver mathematics support materials, free of charge, to everyone looking for post-GCSE maths help. mathcentre offers resources for staff to use with their students, including quick reference guides, workbooks and revision materials, as well as online practice exercises. www.mathcentre.ac.uk/

- **Sigma** is the Centre for Excellence in the University-wide Provision of Mathematics and Statistics Support. It is a joint venture between Loughborough University and Coventry University, through its Mathematics Support Centre. The website includes further information, student support, research and evaluation, and resources. www.sigma-cetl.ac.uk

- **Helping Engineers Learn Mathematics (HELM)** project resources include workbooks, case studies, computer aided assessment (CAA) for all topics and illustrative computer aided learning (CAL) courseware. www.lboro.ac.uk/research/helm

- **The Higher Education Academy Maths, Stats & OR Network** aims to support lecturers in mathematics, statistics and operational research and promote, disseminate and develop good practice in learning and teaching. mathstore.ac.uk/
Personal Development Planning

Personal Development Planning (PDP) is ‘a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development’ (Houghton & Maddocks, 2005). The primary objective for PDP is to improve the capacity of individuals to understand what and how they are learning, and to review, plan and take responsibility for their own learning. This will help students:

- become more effective, independent and confident self-directed learners;
- understand how they are learning and relate their learning to a wider context;
- improve their general skills for study and career management;
- articulate personal goals and evaluate progress towards their achievement;
- develop a positive attitude to learning throughout life.

The PROGRESS project guide *Personal Development Planning for Student Retention and Progression in Engineering* (Smith, Beggs & Robinson, 2003) offers a review of how PDP can be used during induction and first year courses to support retention strategies. Table 5 poses several questions about PDP.
enhancing the first year experience for engineering students

Table 5. PDP

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is PDP introduced in induction?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>2. Does the department offer advice on PDP or is this service provided?</td>
<td>Department/service</td>
</tr>
<tr>
<td>3. What PDP activities are offered by the department (rather than student services)?</td>
<td></td>
</tr>
<tr>
<td>4. Is PDP embedded as part of the work you do with students?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>5. Are students encouraged to complete goal or target sheets and to reflect on them?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>6. Does the department follow up on these goals?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>7. If so how?</td>
<td></td>
</tr>
<tr>
<td>8. Have other follow up strategies been considered?</td>
<td>Yes/No/Not sure</td>
</tr>
<tr>
<td>9. Are you familiar with student-centred learning?</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Where next?

- The **RAPID 2000 Project** aimed to promote skills development on undergraduate programmes in civil and building engineering, based on professional development needs. There are several customised versions of the original Construction Management Web-based RAPID Progress File covering a range of (mainly) construction related disciplines, including Civil Engineering and Quantity Surveying, which enable students and graduates to record their achievements and engage in the processes of Personal Development Planning (PDP). rapidprojects.lboro.ac.uk/rapid2k.html

- The **Centre for Recording Achievement (CRA)** is a national network organisation which seeks to ‘promote the awareness of recording achievement and action planning processes as an important element in improving learning and progression
enhancing the first year experience for engineering students

throughout the world of education, training and employment’. CRA is an Associate Centre of the Higher Education Academy and offers a range of services to higher education institutions and their communities aimed at supporting the implementation of progress files, personal development planning and e-portfolios. www.recordingachievement.org/

First year experience audit
The First Year Experience Audit tool produced by the Engineering Subject Centre (2005) aims to not only support departments as a whole but also individual lecturers and tutors to reflect on their own knowledge and understanding of retention issues and how the first year experience could be improved for their students. An audit is a good way to initiate discussion and development on an issue. It enables you to make clear the range of activities which may contribute to the issue. The process can both help to identify deficiencies and reassure colleagues that quite a lot of work may already be developed in the area.

All the questions are based on activities used within one or more engineering departments in response to a concern about retention and in which adoption of that practice has resulted in an improvement in retention. These activities are therefore worthy of consideration as possible 'good practice' within your own departments.

The audit is divided into 12 sections.
1. Defining the problem
2. Identification of at-risk students
3. Induction and transfer
4. Pastoral care, tutoring, mentoring and PAL
5. Learning styles
6. Attendance
It is suggested that each academic is offered the audit to determine the extent of the knowledge throughout the department. If some staff members are unaware of the existence of a particular policy or strategy this may be the time and opportunity for them to be made aware. You may choose to focus on a particular area or collection of questionnaires within the audit to suit, for example a short lunchtime meeting or an away day or workshop.

**Employability audit**

Employability is not about having a job. Employability is about having the skills, abilities and knowledge to obtain a job of choice. The Engineering Subject Centre employability audit tool (2005) is designed to be completed as a team activity within or across departments. It is not intended for assessment of individual modules. The purpose of the audit is developmental, to help academic staff consider the content and design of a course with respect to the issue of employability, and to see where they could improve the course to better address this issue. It is divided into eight sections.

1. Graduate employment
2. Career-path development
3. Relationships with employers
4. Work experience
5. Does your curriculum promote employability?
enhancing the first year experience for engineering students

6. Are students helped in obtaining and developing careers?
7. Extra-curricula activity
8. Employability general

Both audits were adapted from originals developed by the Higher Education Academy Subject Centre for Bioscience (www.bioscience.heacademy.ac.uk/resources/audit.aspx) and are freely available to download at www.engsc.ac.uk/downloads/FirstYearExperienceAudit.pdf and www.engsc.ac.uk/er/employability/audit.pdf.

Each audit also includes background material, general references, resources and links at the end of each section. A selection of materials can be found below and a comprehensive list will be provided as part of a companion Wiki to this guide.

Reports on retention and progression
- HEFCE Performance indicators in higher education www.hefce.ac.uk/learning/perfind/
- QAA Enhancement Themes Transition to and during the first year www.enhancementthemes.ac.uk/documents/firstyear/Transition%20-%20Final.pdf

General literature and bibliographies
enhancing the first year experience for engineering students

Projects supporting retention and progression

- PROGRESS 1. This FDTL project investigated the causes of attrition and sought effective countering measures. Resources from the project include a series of case studies and educator guides focusing on engineering www.hull.ac.uk/engprogress/

- STAR (Student Transfer and Retention), www.ulst.ac.uk/star/

Pastoral care background material

- Balance. An FDTL project offering educator guides to mentoring, www.balance.ac.uk/


Learning styles background material

- Engineering Subject Centre Learning and Teaching materials – easy to read papers prepared by Dr. Warren Houghton outlining the background to learning styles, www.engsc.ac.uk/er/theory/index.asp

- Halstead, Alison (2003) Engaging Students with Learning and Personal Development by Using a Thinking Styles Questionnaire, Progress Guide No 6. An overview and case study on use of thinking styles for engineering students of different disciplines, and how use of this technique improves retention. Contains useful references on thinking styles www.hull.ac.uk/engprogress/. See also www.thinkingstyles.co.uk
Attendance background material

Middleton, Walter (2003) Communication for Retention, Progress Guide No 2 provides case studies from several universities on how student tracking and intervention is undertaken, and some useful references, www.hull.ac.uk/engprogress/

References

All online references in the text and below were accessed on 22 May 2008.


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The Higher Education Academy Engineering Subject Centre Teaching Awards www.engsc.ac.uk

HEFCE (2005) www.hefce.ac.uk/learning/nss/data/2005


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Author's biography

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Liz Willis has a degree in Industrial Design and Technology with Education. Since graduating she has worked for Loughborough University’s Admissions and Accommodation departments and been a Design and Technology teacher, teaching 11-19 year olds. Liz has been working with the Engineering Subject Centre since 2002 and coordinates a number of the Centre’s activities, including Teaching Awards, Mini-Projects, events calendar and the Assessment of Learning Outcomes in Engineering Working Group (ALOE).

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Interaction

We would like to hear your views and feedback on this publication to help keep the guide up to date.

There is an interactive version of the Guide, where you can comment on each paragraph individually, or on sections as a whole, this can be found at www.engsc.ac.uk/teaching-guides

How does it work?

To view a section, click the section name in the Table of Contents on the left. The paragraphs within the section are shown in one column, with a box on the right showing the comments which have been submitted by other readers. Next to each paragraph, there’s a small grey speech bubble. Click on this to bring up the comment form. Please abide by our moderation policy or your comment will not be published.

What happens next?

The feedback and discussion received will be reviewed by the Centre and author, and views and suggestions will be incorporated into new editions of the guide.

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This is one of a series of peer reviewed booklets looking at various aspects of teaching and learning aimed at all those involved in engineering education. The complete series is also available on our website.

About the centre:

The Engineering Subject Centre is one of the 24 subject centres that form the subject network of the Higher Education Academy. It provides subject based learning and teaching support for all engineering academics in the UK.

The Centre’s Mission is: to work in partnership with the UK engineering community to provide the best possible higher education learning experience for all students and to contribute to the long term health of the engineering profession.

It achieves this through its strategic aims: sharing effective practice in teaching and learning amongst engineering academics; supporting curriculum change and innovation within their departments and informing and influencing policy in relation to engineering education.