Promoting higher quality

Preparing for Academic Review

Self-evaluation document writing workshop

Exemplar SED

University of Wessex

Faculty of Engineering and Science

Self-evaluation document for Engineering
March 2001

University of Wessex: Faculty of Engineering and Science self-evaluation document for Engineering

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Notes for reviewers

1.This SED discusses taught courses in the School of Engineering. These courses are:

- BSc/BEng/MEng Engineering Design
- Postgraduate Diploma/MSc Engineering Design

1.The School also offers a Research Student programme. This is outside the scope of this review, and so information about this programme has not been included in this SED.

2.The numbers in brackets in the text are references to the university's documents listed in Annex 1. The underlined statements and questions are those set out in Annexes C and E of the Handbook for academic review, QAA, 2000.

Overall aims of the subject provision

A clear statement of the overall aims of the subject provision, reflecting the distinctive mission of the institution.

University of Wessex Mission Statement (1)

The University:

- fosters creativity and initiative;
- develops practical and analytical skills;
- encourages excellence in learning and teaching;
- promotes high quality research.

In order to achieve this, it is committed to:

- a learning environment with first class facilities and a high level of student and staff support in which all students may achieve their full intellectual and creative potential, including transferable skills;
- the full range of internationally recognised higher education qualifications from undergraduate through postgraduate to research degrees;
- methods of full-time, part-time and mixed modes of study which allow for diversity of entry and access, and flexibility of delivery, including distance learning;
- an internationally competitive research environment;
- a secure and diversified income base, with significantly less dependence on the taxpayer.

School of Engineering Mission Statement and Aims (2)

The School of Engineering endorses the definition of Engineering set out by the Engineering Council in Part 2 of SARTOR 3rd Edition:

> "Engineering is a profession directed towards the skilled application of a distinctive body of knowledge based on mathematics, science and technology, integrated with business and management, which is acquired through education and professional formation in a particular engineering discipline. Engineering is directed to developing, providing and maintaining infrastructure, goods and services for industry and the community."

The School aims to:

- maintain and develop a distinctive education in engineering that enables every student to attain the highest level of professional and personal development that he/she can achieve;
- ensure that its programmes meet the requirements for accreditation by the relevant professional bodies;
- equip all undergraduates with knowledge and both practical and general transferable skills to enable them to play a leading and creative role as incorporated or chartered engineers in industry or elsewhere in the community;
- provide MEng programmes which offer breadth and depth in their respective engineering disciplines;
- ensure that students acquire an understanding of their professional and ethical responsibilities and of the impact of engineering solutions in a global environmental context;
- respond through postgraduate programmes to the needs of specific industries;
- maintain and develop appropriate opportunities for staff to pursue personal development, research, teaching and professional consultancy in accordance with the University's agreed procedures;

- recognise the right of staff to develop teaching programmes which cover agreed course objectives, whilst allowing them the academic freedom to decide on the appropriate means by which to achieve these.

Learning outcomes

How appropriate are the intended learning outcomes in relation to the overall aims of the provision, the subject benchmark statements for Engineering and other external reference points?

Overall aims

The intended learning outcomes (3) are appropriate to the aims of the University and School in that they determine areas of knowledge and levels of professional skills and transferable skills which encourage the improved understanding and abilities of the students individually, as engineers and as members of society. In addition they reflect professional and intellectual objectives which will assist students to make a positive contribution to industry, commerce and society more broadly.

Subject benchmark statements

The School has adopted the subject benchmark statements for engineering as the basis for the learning outcomes for all its programmes (4). Practical and transferable skills are dealt with as integral components of the programmes. The learning outcomes address the full spectrum of knowledge, abilities and skills expected of graduate engineers, including mathematics, science, information technology (IT), engineering practice, the business context and, centrally, design.

External reference points

All the programmes meet the requirements of the relevant professional bodies and reflect the educational requirements for incorporated or chartered engineering status (SARTOR 3rd Edition). The Dearing and Garrick reports provided the educational context.

How effective are the measures to ensure that staff and students understand the aims and intended learning outcomes of programmes?

Staff

Until the session 2000-01, the School used aims and objectives as the basis for developing modules and programmes. Although learning outcomes have always formed part of the information used by staff and given to students, they have tended to be implicit and appeared sporadically in handbooks, yearbooks and course documentation. In addition, the outcomes tend to be focused on a specific year, level or project rather than leading towards a programme outcome.

The intended learning outcomes of programmes have been adopted as part of a review of the framework of courses and staffing in the School (7). For the session 2000-01 staff, particularly level and subject co-ordinators, have been asked to ensure that the learning outcomes for programmes and the stages of progression through the levels towards these outcomes are explicit in any documentation on courses and projects. All staff should be familiar with the 'Procedures and Criteria for the Validation of Courses, Programmes and Examinations in Engineering Design' (5) and the 'subject benchmark statements for engineering' (4). Also they have been asked to ensure that the outcomes of their teaching take into consideration the contents of a compilation of learning outcomes (8) for the various levels of the programmes.

Students

The School of Engineering Yearbook (2) has been the prime source of information for students to become aware of intended learning outcomes. However, the emphasis has been on aims and outcomes for specific years or modules rather than for the overall programme and the way that the various levels and subjects contribute to that.

For the session 2000-01 the Yearbook (2) will be separated into a Handbook and Yearbook. The former will contain primarily administrative and procedural information; the latter will concentrate on the curriculum including aims and outcomes for subjects, levels and programmes.

How effective is the content and design of the curricula in enabling the intended learning outcomes to be achieved?

The design of the structure of the curriculum is currently a compromise

between the former year-based system used in the School and the modular system being progressively introduced in the University. This compromise leads to inconsistencies in which ‘modules’ are made up of combinations of elements from different subjects drawn together because, in themselves, they do not comprise one module. In addition, the requirements for pre- and co-requisites result in the antithesis of a flexible modular system, with very little opportunity for students to take part in options or electives within the School, Faculty or University. This was pointed out in the report of University Internal Academic Audit (12) and is addressed in the Annual Report and School Development Plan 2000 (16 - p 12-13) and in the Interim Response of the School (6).

The School continues to give careful consideration to modularisation. The postgraduate programme in Engineering Design has been fully modularised. The School is currently engaged in a research project that will result in restructuring on a modular basis to develop a coherent suite of full-time, part-time, and continuing professional development (CPD) credit accumulation courses.

Academic and intellectual progression

Academic and intellectual progression within the curriculum is achieved primarily through the increasing complexity of the project-based learning opportunities provided by the design/technology workshop. (14). This progression is usually complemented by a year of industrial experience. The diversification available at Level 3/4 builds on design complexity by introducing specialisms. Parallel lecture and seminar courses support this evolutionary development and generate their own progression paths.

There is discussion taking place within the School in relation to the balance between teaching and learning. An external examiner (9) at Level 4 has expressed concern that learning does not begin soon enough. However, the design/technology workshop is a learning environment and students begin the process of learning and individual research as soon as they begin the first level of the programme. This is shown by the aims, outcomes and evaluation of specific projects during Level 1 and confirmed by the aims, outcomes and evaluation in Environmental Context (3) at Levels 1 and 2. Nevertheless, the

development in research and writing skills at Level 2 appears not to be commensurate with the improvement in verbal abilities. Students joining the School at Levels 2 and 3 perform no better than students who have been in the School from Level 0, which suggests that the problem is not confined to this School.

At masters level external examiners have recommended the introduction of a course in Research Methods for students intending to write dissertations. The course committee is considering a format for this. Also, the Faculty has recently appointed a new Director for the Graduate School and a generic course is likely to be proposed.

Another debate that is taking place within the School revolves around the issue of specialisation at Level 3/4. There is agreement among staff that a substantial and coherent core of engineering applications is fundamental to all the programmes and to accreditation requirements. The argument centres on the issues of whether students after Level 2 have been exposed to a coherent and comprehensive enough core and how appropriately the specialisms that are offered at Level 3/4 complement that core. The practical, intellectual and professional progression of students is fundamental to the discussion but also important is whether there is sufficient coverage of organisation, management and business in the professional studies modules. This is a debate which is healthy for the School and its position with regard to the development of engineering design education.

Appropriateness of content in relation to the level of the award

Generally, the relationship between the content and the level of the award is well balanced throughout the programmes. However, there has been, and continues to be, concern about the integration of subjects in the design/technology workshop. This view was expressed by the Industrial Advisory Board (17) during a visit to the School in 1996 with reference to technology, and measures (16) were implemented which ameliorated its concerns. However, this session a similar concern has been highlighted by one external examiner at Level 3 (9) and by staff involved in design/ technology workshop and environment in their individual self-evaluations (10). It should be noted, however, that the external examiners at Level 4 have not

pointed to this as an issue.

The new framework for staff and course organisation (7) attempts to resolve the concern in two ways. Subject co-ordinators have been asked to determine stages of progression to the intended learning outcomes throughout the levels of the programme and co-ordinate staff within the subject area to that aim. Level co-ordinators have been asked to ensure that the outcomes at each level are integrated into a coherent whole across a level and that they form relevant stages towards the outcomes for the whole programme.

A further view expressed by the Industrial Advisory Board (17) and in the report of the last HEFCE Quality Assessment (QA) (18) pointed to the need to encourage students in the use of computer-aided design (CAD) in all years and to consider an elective in computer studies. At present students are not being adequately prepared in the use of digital presentation and modelling techniques and measures are being taken to rectify this (16 Computing). The School is reviewing IT teaching and learning throughout Levels 1 and 2 to ensure that all students entering their year of industrial experience, or undertaking a Level 3 design project, are adequately prepared for the demands. This depends on adequate resources (Quality of learning opportunities: Physical resources). Within Levels 3 and 4 students are encouraged to use digital media; however, the School is also considering the introduction of an elective in Electronic Media at these levels.

Apart from the integration of technology, there are other subjects that have not received adequate consideration within the curriculum. These involve aspects of the needs and aspirations of clients, the impact of design upon the wider community and the impact of regulatory frameworks. This is being addressed by the piloting of revised modules in Professional Studies at Levels 2 and 3 and by the introduction of a new lecture series at Level 4 (MEng).

Inclusion of recent developments in the subject

Currently there is no formal method for ensuring that recent developments in the subject are included in courses. It relies on the initiative of individual members of staff. Until recently there has been no formal requirement for staff to develop their interests and pursue research. The introduction of explicit time for personal development during the session 2000-01 (7) and the re-

introduction of staff appraisal and development will help staff remain conversant with developments and encourage their introduction into the programme.

Reflection of best practice in pedagogy

Staff are encouraged to attend the University's programme of Staff Development events and to become members of the Institute of Learning and Teaching (ILT).

How effective is student assessment in measuring the achievement of the intended outcomes of programmes?

Enabling students to demonstrate achievement

Students are able to demonstrate achievement in a variety of ways (3), which ensures regular formative and diagnostic assessment throughout a term or module as well as the final summative assessment.

Discriminating between different categories of performance

The School uses the University's Common Criteria for Assessment and Grade Descriptors (15) to discriminate between different levels of performance and determine progression. With the encouragement of the University, the School expanded the descriptions in the categories to make them more suitable for Engineering Design (15). During the assessments at the end of the session 1999-2000 difficulties were encountered with some of the descriptions and they will be adjusted for session 2000-01. The standards suggested in the subject benchmark statements for engineering are being considered in the process of making these adjustments.

Promoting student learning (especially through formative assessment).

Formative assessment is an integral component of design/technology and laboratory/workshop sessions and forms the basis of the learning process throughout the School and works well. It is also integral to the seminar and tutorial system adopted for examples and problem-solving. Regular contact with a supervisor ensures that students receive feedback on work they are engaged in to enable them to determine how they might proceed.

Quality of learning opportunities

How effective is teaching and learning in relation to programme aims and curriculum content?

Range and appropriateness of teaching methods

The range and location of types of teaching methods can be seen in the programme specifications (3) and in the Yearbooks (2). The range of methods is usual within engineering design education (4); however, concern has been expressed in the report of the University Internal Academic Audit regarding the intensive method of staff teaching in the design/technology studio and workshop (12) and the appropriateness of specific methods of teaching at certain levels within the programme. The School has indicated in the Development Plan for 2000 that it will continue to investigate methods of less intensive staff teaching which might provide an equally rich and varied learning experience (16 - Course Delivery p 12-13). In addition, the School has set itself the objective of exploring the possibilities for using new technologies in course delivery (16 - Course Delivery p 12-13).

The full integration of learning from the subjects of Industrial Context, Environment, Technology and Professional Studies into the design project is recognised as important but has not always been achieved to a satisfactory standard (see Curriculum and Assessment: Appropriateness of content in relation to the level of the award).

Within each level of the programme, the approach to integrating technology and environment varies; however, there are common issues. At Level 2, visiting engineers are brought in to work with students intensively over a short period at certain stages in their design projects. This has been extremely useful for students and staff. Members of staff have recommended some changes in this arrangement for the forthcoming session in response to a review of the system that operated last year (10).

A further area of concern has been the location and amount of Professional Studies teaching and learning within the curriculum up to Level 2. Until the session 1999-2000, the School operated a Professional Studies course, which ran in parallel to the remainder of the curriculum. In 1999 a start was made to

integrate the course with the rest of the curriculum (19). In the session 2000-01, two pilot modules will be devoted to Professional Studies, one at Level 1 and the other at Level 2. This should ensure that the learning outcomes are wholly integrated within the academic curriculum while continuing to satisfy the requirements of the profession.

Ways in which participation by students is encouraged

In the discrete lecture and seminar courses, students are required to take part in seminar presentations and discussions. Within the design/technology studio, the nature of the process ensures that students participate through dialogue with tutors and colleagues. Students are encouraged to ensure that notes from the discussion of their proposals are recorded. An extension of this, the personal diary, proved unsuccessful since it was not assessed (16).

Within the unit system at Level 3/4, students can develop their own design project and a substantive piece of investigative research. The value of this is continually monitored and discussed (Curricula and assessment. Academic and intellectual progression).

The types of materials that are used vary providing a diversity of experience (16).

Strategies for staff development to enhance teaching performance

The School has not had a strategy for staff development for some time. As a result, no system has been in place to enhance teaching performance, although the issue of staff development was raised in the HEFCE QA report of 1994 (18) and in the University Internal Academic Audit of 1999 (12). In the Institute of Electrical Engineers (IEE) Accreditation Visit of 1996 (20) a recommendation was made that more resources be allocated to staff development.

Since 1998 there has been a period of transition in which the Acting Head of School began the process of appraisal to develop a strategy but was unable to complete the process due to illness. A framework has been put in place for staff appraisal and personal development in 2000-01 (7).

Effectiveness of team teaching

Team teaching as an explicit method has not been used within the School. The new framework for level and subject co-ordinators (7) simply formalises the previous method of teaching with staff in distinct groups for each of the major subject areas and at each level of the programme. While this has not always functioned effectively in the past (see Curricula and assessment) the School is confident that the new system will be beneficial. It will be monitored closely throughout the session by the co-ordinators and course committees.

Student workloads

Within the overall workload defined by the University modular system, it is difficult to monitor exactly how much time students are working, but it is clear that they are having to control their time very effectively since many of them are having to earn money to support their study. The School advises students (2) of the expected workload in the Yearbook and at the start of academic sessions and courses, and although there is no formal monitoring this seems to function well.

Students on the BSc in Engineering Design have expressed concern about the nature and extent of their workload (21). Consideration is being given to grouping cognate modules to resolve this.

How effective are the strategies of academic support in terms of student progression? How do they take account of ability profiles in relation to programme aims?

Recruitment and induction

Almost all potential first year and many other students are invited to interview. All full-time and some part-time staff take part in the process. This process is of benefit to candidates who are able to make an informed decision about studying in the School and to staff who are confronted by the range of candidates who are interested in studying engineering design.

The School has no formal induction process for new students. First year students respond well to introductory talks and visits. From 2000-01, central services will provide a university-wide induction, such as the library service

already offers.

Identification and action on special needs

The School has a good record of responding to the needs of students with learning difficulties and has produced a paper on accessibility (23). Staff identify students' special needs during admission, through students expressing specific requirements or through observation and evaluation during tutorial contact. The School has an Equality and Learning Support Adviser and a policy has been published (22).

The University offers language support for overseas and exchange students who wish to improve their spoken and written English. The take up and response has been good. Staff can also insist that students attend if they are of the opinion that a student requires assistance. The School employs support for overseas masters and research students with their written English. This is greatly valued by students.

Feedback to students on progress

Within the School there is no consistent written documentation governing feedback to students on progress. Each student receives a written report on their progress, either at the end of each term or at the end of a module or group of cognate modules. In addition, students receive feedback (formative assessment) during design/technology workshop teaching every week and at the reviews which take place during and at the end of projects. This system has worked effectively.

Overall academic guidance and support

The HEFCE QA report (18) and the University Internal Academic Audit (12) report both comment on the high standard of pastoral care and guidance.

In the Yearbook there are references to the Student Handbook (24), which covers all Schools and the 'Student Guide and Code of Practice' (26) as well as to staff who are designated 'Links' to student services and counseling. These 'Links' seem to function well.

Tutorial support

This is fundamental to the educational programmes of the School and support is extensive and intensive across levels and within subjects.

How adequate are learning resources and how effectively are they used?

A strategic approach linking resources to intended learning outcomes

There are three current documents, which describe the approach of the School:

a) The objectives and actions listed in the Annual Report and Development Plan (16).

b) The School Research Strategy particularly sections 3 ‘Strategy’ and 4 ‘Implementation’ (13).

c) The framework (7).

Due to the transition which the School has undergone in the last three years, these documents can only form a starting point for strategically linking resources to learning outcomes. Already it is clear that this more strategic approach could realise opportunities to focus on aspects of the intended learning outcomes which have not received sufficient emphasis (Curricula and assessment). In addition there is the basis for a staff development and personal development/research programme, which sets out to directly link resources with learning outcomes.

Physical resources

The unsuitable configuration of the building for disabled access, cramped design/technology studio/workshop accommodation and the implications of the workshops being remote from the main laboratories were highlighted in the reports of the IEE Accreditation Panel 1996 (20) and the HEFCE QA in 1994 (18). Since then the situation has become worse. Student numbers have had to increase to generate an adequate income base for the School yet the amount of available accommodation has been reduced through the University allocating engineering space to other schools and central administrative functions.

Issues which continue to militate against existing students and attracting potential students are the difficulty in maintaining a policy of offering all students workspaces while maintaining lecture and seminar spaces. The insufficient number of adequately serviced and supervised workshops also continues to be a concern (16 - p 10-1 1). Although other Schools in the Faculty have workshops, the demand from their own students make it very difficult for engineering design students to gain additional access.

The HEFCE QA report in 1994 (18) highlighted the limited and dated nature of the computing provision. This had improved by the time of the visit of IEE Accreditation Panel (20). Now the School has 17 CAD stations for 189 undergraduate students and the Faculty provides three further computer rooms for general use.

The School's objectives of examining less intensive methods of teaching and attempting to incorporate new technologies into course delivery (16 p 10-13) illustrate its willingness to adjust and develop its physical and human resource base. However, the Executive Summary of the School Development Plan 2000 was agreed by the Faculty only after a caveat was added regarding resources. In addition the requirements listed in the first two years of the School's five year Capital Equipment plan (27) have not been realised.

The reports of the IEE Accreditation Panel (20) and the University Internal Audit of 1999 (12) refer to the appointment of a full-time Professor of Engineering Design. The School is preparing to advertise the post and recognises it is essential for the School that the successful applicant brings academic leadership and vision to the post.

The balance of numbers of senior staff requires review due to a significant reduction in the proportion over the last three years.

The report of the Accreditation Panel (20) also recommended more technical support. The School has employed additional technical support (6.5 hours each week) by sharing with other Schools in the Faculty, but this is used for maintenance of equipment rather than assistance with projects. In comparative terms with other UK Schools of Engineering, this School is under-resourced.

Generally staff development has been unstructured. (Quality of learning opportunities: Strategies for staff development to enhance teaching performance). One of the objectives in the School Development Plan (16) is the introduction of a coherent programme of staff appraisal and development. This will be implemented by the new Head of School and will require support from the University's Human Resources Department.

4. Maintenance and enhancement of standards and quality

How effective are the measures (quantitative and qualitative) taken to maintain and enhance the quality and standards of provision?

The HEFCE QA of 1994 (18) pointed to a lack of consistency in the mechanisms operated. The report of University Internal Academic Audit (12) commented on the reliance on external bodies and examiners. The School uses the mechanisms for Quality Assurance and the control of standards established by the University, complemented by the Academic Planning and Audit Committee of the Faculty (28). This dual mechanism has weaknesses and on occasion leads to confusion. It is being reviewed.

For undergraduate and postgraduate degrees the School follows the procedures laid down in the University Regulations (30) and in the Quality Manual and other guidelines issued by the Quality Unit of the University (29).

Quality and standards are maintained and enhanced through the framework for staffing and courses (10). A second tier of monitoring operates through the student feedback procedure. Monitoring by the University, external examiners and visiting staff feed into this process at the course committee and School Committee level.

Quantitative measures

Summative assessments for all levels (31) and degree classifications (32).

The cohort statistics for the sessions 1994-95 to 1998-99 show a trend towards a high number of Upper Second and Lower Second class degrees with a few Thirds and fails. However, the number of First class awards has also declined. The external examiners at Level 3/4 have commented on this (9). This trend has continued into 1999-2000 and is being monitored.

Entry qualifications - variances and results (33).

The Admissions and Average Entry Qualification statistics for 1996-97 to 1998-99 (35) show a slight increase in the level of the mean score for GCE A-Levels with a fairly constant intake. Those for 1999-2000 show this trend continuing with a significant increase in intake. The additional numbers accepted in 1999-2000 were due to changes in the pattern of cohort progression in other Schools in the Faculty (see Progression and completion). It is encouraging that this shift did not result in a lower mean score.

Progression and completion (33, 34).

There are two points within the progression sequence at which students normally choose to change programmes or institutions: after HND or Level 1 (Part 1) or after Level 2/3. These form either breaks in the academic pattern, as at Level 1, or an interruption to study in the School, as during the year of industrial experience. It is the return rates and joining rates at these levels which dictate the numbers which are admitted to Level 1, therefore, balancing the undergraduate full-time equivalents (FTEs) overall.

In times of increasing mobility it is no surprise that students consider changing institutions, this is healthy and should be encouraged. Concern was expressed in the University Internal Academic Audit report (12) about a 25 per cent withdrawal rate from the 1996-97 first year cohort returning for Level 2. Unfortunately the report did not draw attention to a 22 per cent increase in the number of students directly entering Level 2. Both are worthy of note but no trend has been established.

Mobility can only be sustained if the numbers leaving can be balanced by the intake. In session 1999-2000 the numbers returning to Level 3/4 were down by 20 per cent and the School has decided to conduct a survey of students to establish why they leave, return or join the programme (35).

There is some concern as to the value of cohort statistics in a period during which mobility and the need to work to fund study are becoming increasingly more common.

First employment destinations (36, 37).

Despite following the recommendation of the University Internal Audit (12) the

situation remains as it was. Over 50 per cent of students are listed as 'Circumstances Unknown'. There is a need for better liaison between the Practical Training staff and the Careers Advisory Service.

Student feedback.

Student responses to questionnaires (21) are considered initially by the Head of School who speaks to staff where there may be concerns. The statistics are then circulated to all staff, course committees, the staff-student committee and the School Committee.

The timing of the circulation of student questionnaires at the end of the session can result in difficulties in providing information promptly to the staff-student committee at the end of the third term. The poor level of student attendance at course committees compounds this. There has also been discussion about whether all information gathered, including individual comments, should be circulated to all staff and students. In 1999-2000 the comments were not circulated. Since the responses to questionnaires are determining factors in the development of courses and staffing for the subsequent session, an improved timetable for the gathering of responses and distribution of results is being discussed.

Staff feedback

There is no formal process for staff feedback apart from the co-ordinator and committee structure. The staff appraisal system will offer another route for feedback. At the end of the 1999-2000 session staff were asked for an evaluation of the courses they were involved in (10). Although the information was useful, more detailed guidance will be provided for future submissions.

External examiners' reports

The procedure is laid down by the University in 'External Examination' section of the Quality Manual (29). Two issues have arisen concerning the system. These are the length of time taken for the procedure through the University and the lateness of some examiners' submissions. These have made it difficult to circulate the reports to the staff and committees in time to consider and effect changes for the subsequent session. One solution has been to

request that an informal copy be sent to the School at the same time or before it is sent to the University. While this conflicts with the system prescribed and not all external examiners agree, it does serve to allow consideration to be taken of their comments within a useful timescale.

To date examiners have not been furnished with all aspects of the programme and assessments at the level they are examining. It has been the usual process that external examiners concentrate on examining design projects. As from 2000-01 external examiners will receive information on all aspects of the level they are examining, including coursework and examination scripts.

Employers' views

The reports from the Industrial Advisory Board, consisting of local employers, many of whom accept students for industrial experience placements, are good. (40) The views of students' industrial supervisors tend to be brief but they provide a positive impression. (38)

Monitoring by professional bodies

The IEE Accreditation Panel visited the School in 1996 (20) and recorded three main concerns. The School responded to these issues in 1997 (16) and recognition was continued in 1997.

Currently, the School Development Plan for 2000 (16), the Research Strategy (13) and the organisational framework (7) illustrate the School's future direction. The integration of technology is discussed in Curricula and assessment and Quality of learning opportunities. The discussion in the School about the unit system in Level 3/4 is introduced in Curricula and assessment.

Previous quality assessment/subject reviews

The report of the 1994 HEFCE QA (18) judged the quality of educational provision to be 'Satisfactory' and suggested three areas for improvement.

The rationale for teaching in years 3/4 is explained in Curricula and assessment: Academic and intellectual progression. The School Research Strategy (13) illustrates the way in which the School intends to use the

postgraduate courses to underpin research and to co-ordinate research with teaching. The dislocation of research activity from the rest of the School is a disadvantage; however, the Graduate School of the Faculty of Engineering and Science and its community of research students provides advantages for the students and generates a multidisciplinary atmosphere. The School has no control over the location of specialist workshop accommodation.

Internal re-validation

The main response to the report of the University Postgraduate Studies Committee Quinquennial Review (39) has been the changes to the length of the taught masters programmes (38). The Course Committee is now considering ways in which a decision can be made as early as possible for a student to receive approval to proceed to masters level so that this preparation can be effective.

The University Internal Academic Audit (12) made five recommendations for the attention of the School. These have been considered and an interim response submitted on 28.07.00. (6) The full response will be submitted prior to 31.12.00. The School Development Plan (16), the School Research Strategy (13) and the proposed staff and personal development arrangements (7) will satisfy three of the report's recommendations. The other two refer to the methods for design/technology studio/workshop teaching and learning, and exploring the benefits of modularisation. Both are addressed in the School Development Plan (16 - Course Delivery p 12-13).

The design project is the basis of the education which the School offers, and the style of teaching provides a rich and varied learning experience for students. While the School is always receptive to new methods of teaching it is equally concerned to ensure that the quality of the experience for students is not diminished. The important issue is not the amount of contact time in studio teaching, but whether there is sufficient time and support for staff to become involved in other activities which are of value to themselves, the students and the profile of the School.

(5984 words)

Annex 1

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31. University of Wessex School of Engineering (1997-98 - 1999-2000) Examination Marks Schedules.

32. University of Wessex School of Engineering (1997-98 - 1999-2000) Examination Marks Schedules BSc/BEng/MEng Degree Award.

33. University of Wessex (1996-97 - 1998-99) Course Monitoring and Review Report for first degree courses.

34. University of Wessex School of Engineering (1996-97 - 1998-99) Cohort Statistics.

35. University of Wessex School of Engineering (2000) Questionnaire for Level 3/4 students.

36. University of Wessex Careers Advisory Service (98) School of Engineering. First Destinations of 1998 First Degree Graduates.

37. University of Wessex Careers Advisory Service (98) School of Engineering. First Destinations of 1998 Taught Postgraduates.

38. University of Wessex School of Engineering. Record of Industrial Experience. Quarterly Summary. ‘Supervisor’s Appraisal of Placement Students’.

39. University of Wessex Postgraduate Degrees Committee: Quinquennial Review of Engineering

40. University of Wessex Industrial Advisory Board: Minutes 1998-99, 2000-01.

Annex 2: Programme specification BSc/BEng/MEng Engineering Design

1. Awarding Institution: University of Wessex

2. Teaching Department and Faculty: School of Engineering, Faculty of Engineering and Science

3. Programme accredited by: IEE

4. Final award: BSc/BEng/MEng.

5. Programme title: Engineering Design

6. UCAS code:

7. Relevant QAA subject benchmarking group: Engineering

B. Date of production: August 2000

9. Educational aims of the School:

The School aims to:

- maintain and develop a distinctive education in engineering that enables every student attain the highest level of professional and personal development that he/she can achieve;
- ensure that its programmes meet the requirements for accreditation by the relevant professional bodies;
- equip all undergraduates with knowledge and both practical and general transferable skills to enable them to play a leading and creative role as incorporated or chartered engineers in industry or elsewhere in the community;
- provide MEng programmes which offer breadth and depth in their respective engineering disciplines;
- ensure that students acquire an understanding of their professional and ethical responsibilities and of the impact of engineering solutions in a global environmental context;

- respond through postgraduate programmes to the needs of specific industries;

- maintain and develop appropriate opportunities for staff to pursue personal development, research, teaching and professional consultancy in accordance with the University's agreed procedures;

- recognise the right of staff to develop teaching programmes which cover agreed course objectives, whilst allowing them the academic freedom to decide on the appropriate means by which to achieve these.

10. Programme Outcomes

<table>
<tr><td colspan="2">The programme provides opportunities for students to develop and demonstrate knowledge, understanding, skills and other attributes in the following areas. The outcomes have reference to the Quality Assurance Agency for Higher Education: Subject Benchmark Statement for Engineering; accreditation requirements of IEE. NB: BSc/BEng graduates are expected to meet the outcomes at least to Threshold level and MEng graduates at least to Good level, as defined in the Engineering Benchmark Statement.</td></tr>
<tr><td colspan="2">A: Knowledge and understanding of:</td></tr>
<tr><td>Mathematics</td><td>Teaching/learning methods and strategies</td></tr>
<tr><td>1 Mathematical methods appropriate to Engineering Design (ED)</td><td rowspan="2">Acquisition of A1-A3 is through a combination of lectures, examples classes, workshops, coursework and projects at Levels 1, 2 and 4. This is supplemented by industrial experience at Level 3.</td></tr>
<tr><td>2 The selection and use of appropriate numerical, analytical and algorithmic methods</td></tr>
<tr><td>3 Appreciation of the limitations and range of applicability of mathematical methods in ED</td><td></td></tr>
</table>

Science 4 Essential scientific principles	Acquisition of A6-7 is through a combination of lectures, workshops, coursework and projects at Levels 1, 2 and 4. Acquisition of A8 is through practical ITC workshops and projects at Levels 1, 2 and 4.
5 Appropriate scientific principles and the extent of their applicability to ED	
Information Technology 6 Principles of IT and communications (ITC) relevant to ED and understanding of their role	
Design	
7 General principles of design and the design process and their applicability in ED 8 Design methodologies and techniques appropriate to ED 9 Characteristics of materials and components relevant to ED	Acquisition of A9-11 is through a combination of lectures, laboratories and design studio at all levels, supplemented by industrial experience at Level 3.
Business Context	
10 Management and business practices, including relevant elements of finance, law, marketing, human resources and quality control 11 Professional and ethical dimensions of ED, including the environmental impact of engineering practices and the social responsibilities of the engineer.	Acquisition of A12-13 is through a combination of lectures, seminars and coursework at Levels 1, 2 and 4, and, where applicable, Level 3 industrial experience.

12 Current operational practice 13 Specific codes of practice and the impact of regulatory frameworks 14 Limitations of the techniques and design factors involved 15 Codes of practice relating to hazards; the role of design and good working practices in operational safety	Acquisition of A14-17 is through a combination of lectures, laboratories, workshops and projects at all levels, and through Level 3 industrial experience
	Assessment
	Testing of the knowledge base is through a combination of unseen written examinations (Al, 2, 4,5, 8, 15) assessed coursework, including examples (A1-3, 5-13, 15); and projects (A3, 5,7-9, 11, 14)
B:**Practical Skills** — able to:	
Mathematics	
1 Select appropriate mathematical methods to apply to ED problem 2 Apply effectively range of mathematical methods for modeling and analysing ED problems	B1-B2 are developed through examples classes and projects.

Science 3 Select appropriate test and measurement equipment and instrumentation	B3 and B4 are developed through independent and collaborative laboratory work and projects at all levels. This is supplemented by industrial experience at Level 3. B5 is developed through workshop sessions, coursework, examples and problem-solving seminars and projects at all levels.
4 Conduct appropriate laboratory experiments, generate data and draw relevant engineering conclusions	
Information Technology	
5 Use programming languages and computer based engineering tools to gather data, solve ED problems and display results	
Design	
6 Produce a design for a component, process or system in response to a specific brief	B6-9 are introduced at Level 1and practised at Levels 2 and 4 in laboratories, design studio and project work, and developed at Level 3 during industrial training.
7 Undertake a simulated or practical test of a design solution	
8 Produce a report on the test, analysing the outcomes	
9 Research and evaluate design solutions	

Business Context	
10 Listen and engage in informed dialogue	B10-13 are developed in seminars and coursework at all levels. This is supplemented by industrial experience at Level 3.
11 Give oral presentations on business and technical information, in a manner appropriate to the audience	
12 Select and use various media in order to communicate to the intended audience	
13 Produce written reports on business or technical matters for a technical or non-technical audience	
Engineering Practice	
14 Apply engineering techniques taking account of industrial and commercial constraints	B14 and 15 are developed through projects at all levels and in Level 3 industrial experience.
15 Produce a project plan, identify the resource requirements and timescales	
	Assessment
	Practical skills are assessed through exams (B1-2), coursework (B3-9, 13), formative seminar presentations (B10-12) and projects (B1-4; 6-9; 14-15)

C: **Intellectual abilities** — able to:	
Mathematics	
1 Demonstrate awareness of functionality of mathematical methods through selection of appropriate method from a range 2 Application of method to ED problem	C1 and 2 are developed through seminars and examples classes, particularly at Levels 1 and 2. C2 is developed in projects at all levels
Science	
3 Use scientific principles to solve ED problems 4 Use scientific principles to model and analyse ED processes and systems	C3 and 4 are developed through laboratories, workshops and projects at all levels.
Information Technology 5 Recognise the potential and limitations of computer based methods for solving ED problems	C5 is developed through projects at all levels, supplemented by industrial experience at Level 3.
Design	
6 Undertake effective analysis and employ it in the development of ED solutions 7 Develop ideas and designs from synthesis of existing solutions	C6 and 7 are developed through seminars, design studio and projects at all levels.
Business Context	
8 Evaluate commercial risk in ED implementations	C8 is developed in Professional Studies seminars at Levels 1 and 2, and in project work at all levels.

Engineering Practice	
9 Integrate knowledge acquired throughout the programme to solve ED problems 10 Evaluate technical risks in the solutions proposed	C9 and 10 are developed through design studio and projects at all levels
	Assessment Intellectual abilities are assessed through examinations, coursework and projects at all levels.

D General Transferable Skills: able to **-**	
1 Sort and manipulate data 2 Present data in a variety of ways 3 Employ scientific methods and analysis of evidence in the solution of problems 4 Use digital and electronic communication techniques, hardware and software, including word-processing, spreadsheets, email and internet	D1-9 are developed throughout the programme through laboratories, workshops, design studio and projects, as well as in industrial experience in Level 3.
5 Assess and evaluate information in order to help produce a solution 6 Communicate effectively, using appropriate verbal, visual, graphic, ITC and written means, according to the audience 7 Manage time effectively and work to deadlines 8 Work in teams, either as a leader or as a member of team 9 Demonstrate the ability learn independently, using a range of information sources and approaches	**Assessment** D1-5 are formally assessed as part of examinations, coursework and projects (see module/brief assessment criteria). D6-9 are normally assessed informally and formatively through seminar presentations and projects, but see Professional Studies modules for formal assessment of D6 and D8.

11. **Award** **Details**	The study of Engineering Design at UoW involves either 3 (BSc/BEng) or 4 (MEng) years. BEng may extend this to 4 years through a year of industrial experience. All MEng students undertake industrial experience placements in level 3, semester 2. The programme is only offered in full-time mode.	
BSc (3 Years) BEng/ MEng	All students take the same 8 modules in both Levels 1 and 2, including mathematics, scientific principles for engineering, software tools, materials, professional studies, engineering applications and design. All second year students undertake an interdisciplinary engineering design team project. Level 3 BSc consists of 6 core modules and a double-credited team project or optional individual project. Level 3/4 includes a range of options for BEng and MEng students and an individual project.	Requires a minimum of 40 per cent in each module. Outcomes developed and assessed. A1-15; B1-9, 13-15; C1-10; D1-5. B10-12 and D6-9 are developed but not assessed formally
Level 3	Most BEng students take a year of industrial experience in an appropriate engineering placement.	Progression requirements: successful completion of placement and placement report. Outcomes developed and assessed A1-3; 9-11; 14-17; B3-4; 6-9;

	All MEng students undertake 2 core Design modules and an individual project in semester 1 and spend semester 2 of Level 3 in an industrial placement, as part of a design team.	10; 13; 14-15; C5; D1-9
2 Dip in Higher Educat	All students take the same 8 modules in both Levels 1 and 2, including mathematics, scientific principles for engineering, software tools, materials, professional studies, engineering applications and design. All second year students undertake an interdisciplinary engineering design team project.	Progression requirements: Minimum of 40 per cent in each module Completion requirements: Minimum of 35 per cent in each module.
1 Cert of Higher Educat	All students take the same 8 modules, including mathematics, scientific principles for engineering, software tools, materials, professional studies, engineering applications and design.	Progression requirements: Minimum of 40 per cent in each module Completion requirements: Minimum of 35 per cent in each module

12. Support for students and their learning

Wide range of laboratories and workshops

Individual, equipped design studio workplaces for every student in Levels 3 and 4; shared spaces in Levels 1 and 2.

Library resources: Faculty of Engineering and Science

Computer suite with 17 CAD machines, word processing machines and other Faculty and University clusters

Planned visits during industrial experience and placement supervisor

Opportunities for exchange programmes within Europe, with the USA and Japan

Access to teaching and learning support services, which provides assistance with language and guidance on supporting students with dyslexia and other disabilities

Course catalogue

School Handbook

13. Criteria for admission

GCE A Levels: CC or equivalent

The range of subjects should encompass sciences and, preferably, design. Mathematics, Physics (or General Science) and English are required at GCSE. A range of alliterative qualifications may be accepted including, in particular, HNC/HND with Merit passes.

Those applicants without standard qualifications being considered for an offer of a place will normally be called for interview. UCAS Guidelines are followed for overseas students. Candidates who are not native English speakers must present evidence of proficiency in English

14. Methods for evaluating and improving the quality and standards of teaching and learning

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards

Subject area reviews

Level reviews

Course Committee review

Industrial experience visits and reports

External examiner reports

Validation reviews

Committees with responsibility for monitoring and evaluating quality and standards

Staff-student Committee

Course committees

Board of Examiners

Mechanisms for gaining student feedback on the quality of teaching and their learning experience

Staff-student committee

Student representation on course committees

Questionnaire evaluation of subject areas

Industrial experience visits and reports

15. Regulations for Assessment

Assessment rules and Honours classification

To qualify for the award of an Honours Degree, students must complete all the course requirements. Satisfactory completion of each module earns 15 credits. A BSc Honours or BEng degree in Engineering Design requires 360 credits; MEng requires 480 credits. A pass mark of 40 per cent applies, except for students deciding to accept an intermediate award, where it is 35 per cent.

An overview of assessment details is provided in the School Handbook/Course Catalogue and a full assessment brief is provided within each project brief and module guide.

Marks from Level 2 and Level 3/4 contribute to the final classification of the degree.

Summary of grades, marks and their interpretation for honours degree classification.

Honours Degree Classification	Grade	Mark	Interpretation
1st	A	70-100%	Has fulfilled all or the majority of the specified learning outcomes to an excellent standard: a very high level of subject mastery and industrial/professional skills; notable achievement in the development of intellectual and personal skills
2.1	B	60-69%	Has fulfilled all or the majority of the specified learning outcomes to a proficient standard: above average level of subject mastery and practical/professional skills; sound achievement in the development of intellectual and personal skills
2.2	C	50-59%	Has fulfilled the majority of the specified learning outcomes to a competent standard: a good level of subject mastery and practical/professional skills; satisfactory achievement in the development of intellectual and personal skills
3	D	40-49%	Has fulfilled the specified learning outcomes to the minimum acceptable level to continue study within that subject and for the award of credit

			points: an adequate standard of subject mastery and practical/professional skills; reasonable achievement in the development of intellectual and personal attributes
Ord.	E	35-39%	Has fulfilled the specified learning outcomes to the minimum acceptable level for the award of credit points but insufficient to continue study within that subject: minimal standard of subject mastery and practical/professional skills; little achievement in the development of intellectual and personal attributes
Fail	F	0-34%	Has fulfilled very few or none at all of the specified learning outcomes, even at the minimum acceptable level and is not eligible for the award of credit points

Note: All coursework and project components must be submitted and all examinations must be attempted.

16. Role of external examiners

The Head of School proposes external examiners in consultation with the Level Co-ordinator and the Dean of the Faculty. The proposal is scrutinised by the Assistant Registrar (Quality) and submitted to the Principal and Deans Committee for consideration. Details of the appointment are forwarded to Senate for ratification.

Two external examiners are appointed for Levels 2 and 3 and two for Level 4. The function of the external examiner is to:

- participate in assessment procedures for the award of degrees;
- arbitrate or adjudicate on problem cases;
- comment and give advice on course content, balance and structure, on degree schemes and on assessment processes.

17. Indicators of quality and standards

1997 Professional accreditation (IEE).

1994 HEFCE Quality Assessment 'Satisfactory'

Annex 3

Programme specification Postgraduate Diploma/MSc Engineering Design

1. Awarding Institution: University of Wessex.

2. School and Faculty: School of Engineering, Faculty of Engineering and Science.

3. Programme accredited by: IEE

4. Final award: Postgraduate Diploma/MSc

5. Programme title: Engineering Design

6. UCAS code: Not applicable.

7. Relevant QAA subject benchmarking group: Engineering (no postgraduate benchmark statements)

8. Date of production: August 2000

9. Educational aims of the programme

The programme seek to build on the outcomes of BSc/BEng/MEng Programmes by encouraging students at **Diploma** level to:

- demonstrate that they can apply themselves to a programme which engages with the wider issues of engineering design, bringing together the skills and understanding that they have developed during the earlier years of study;

- explore both the engineering design and the industrial implications inherent in their programme;

- demonstrate personal management skills appropriate to someone about to enter a profession and enabling students at **masters** level to:

- develop their understanding of and proficiency in engineering design, including new and emerging technologies;

- consolidate accumulated academic and professional experiences in the pursuit of advanced studies;
- challenge preconceptions and pursue an enquiring, discriminating and critical approach to the design and the product or process;
- demonstrate creativity or originality in the application of knowledge to complex engineering design problems;
- produce a viable design project in an industrial environment.

10. Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge, understanding, skills and other attributes in the following areas. The outcomes have reference to the National Qualifications Framework: M level; Quality Assurance Agency for Higher Education: Subject Benchmark Statement for **Engineering; IEE** Accreditation Panel: Criteria for Validation.

A: Knowledge and understanding of:	**Teaching/learning methods and strategies**
Design	
1 The ways that recent past and potential future developments and the existing industrial and social context can inform design processes and proposals	Acquisition of A1 and A3-6 is through a combination of lectures, seminars, coursework and laboratory-based projects at Diploma level. At MSc level, the application of structure, construction, materials and environmental design (A2) is by individual design project in relation to a specific industrial context.
2 The principles of engineering design (ED), including the application of structure, construction, materials and environmental design in relation to industrial and social needs	
3 The impact of regulatory frameworks, the needs of clients or users, the roles of those who collaborate in the manufacturing process and the impact of the design upon the wider community	
4 The importance of communication and dialogue in the development and discussion of design ideas	
5 Both practical and theoretical aspects of modern system design	
6 Modern engineering design concepts and the effects of device and sub-system performance	

Engineering Practice	
7 Current industrial best practice, its limitations and likely new developments	Acquisition of A7-A9 is developed through a combination of seminars, coursework, workshops and industrial visits. At MSc level, acquisition is additionally by individual study.
8 Relevant codes of practice and the design factors involved	
9 Codes of practice relating to operational safety and how these can be applied in a wide variety of situations	
Information Technology	Acquisition of A10-11 is through IT workshops. Acquisition of A12 is through lectures and seminars. **Assessment** Testing of the knowledge base is through a combination of examination and assessed coursework (A1; 5-12), presentations (A3-4), examples and laboratory-based projects (A10-11) at Diploma Level. At MSc level the testing, including A2, is through the project and associated dissertation.
10 The applications of new and emerging technologies	
11 The capabilities of a range of appropriate industrial software packages	
Business Context	
12 The non-technical aspects of the engineering profession, including management practices (finance, law, marketing, personnel and quality control)	
B: **Intellectual Abilities** — able to:	

Design	
1 Analyse, synthesise and evaluate complex design problems in an organisational and commercial context	B 1 is developed through laboratory projects at Diploma level. At MSc level B1-2 are further refined in the individual project.
2 Demonstrate innovation in the design and creation of new systems, products or processes	
Engineering Practice	
3 Integrate knowledge of analytic and algorithmic design methodologies/tools and fundamental engineering principles to solve a range of engineering problems in novel and challenging situations	B3-4 are developed through collaborative project work at the Diploma level and the individual project at the MSc level.
4 Evaluate solution methods and the technical risks inherent in them	
Information Technology 5 Assess the capabilities and limitations of CAD for engineering problem solving	B5 is developed through workshop projects and coursework at the Diploma level and refined at MSc level in the individual project.

Business Context	
6 Formulate strategic plans related to product or process innovation	B6 is developed through the MSc industrially based project. B7 is developed through lectures, seminars and industrial visits at Diploma Level. **Assessment** of intellectual skills is through collaborative projects at Diploma level and individual project at MSc level. B1, 7 are assessed through examinations at Diploma level. B6 is assessed through MSc project. and dissertation.
7 Evaluate the commercial risks of such innovations	
C: Practical Skills – able to:	C2-3 are developed through workshops and laboratory-based collaborative or individual project, with associated coursework reports at Diploma level. At MSc level, C1-2 are further developed through the individual project.
Design	
1 Create an innovative design for systems, products or processes in response to specific industrial or commercial needs	
2 Act autonomously in planning and implementing practical or simulation tests of solutions to design problems	
3 Produce a report to professional standard analysing the test results and recommending any necessary redesign or development	

Engineering Practice	
4 Apply a wide range of engineering techniques, taking account of commercial and industrial constraints	C4-5 are developed at Diploma level in workshops and laboratory-based projects. At MSc level, they are refined through the individual project.
5 Manage a project by monitoring, developing and up-dating the plan according to changing circumstances	
Information Technology	
6 Select and use appropriate CAD software to solve unfamiliar and/or complex problems	C6 is developed in workshops and laboratory projects at Diploma level.
Business Context	
7 Plan the management of a project, including allocation of responsibilities within a team.	C7 is developed in collaborative projects at Diploma level.
	Assessment of practical skills is through laboratory-based projects at Diploma level and through the industrially based individual project at MSc level. C3 is assessed through coursework and C7 through a simulated team briefing, at Diploma level.

D: Transferable skills — able to:	
1 Communicate effectively with engineers or non-specialists, using appropriate visual, graphic, oral or written means	D1 is developed through seminar or workshop presentations at Diploma level and through the dissertation presentation at MSc level.
2 Work in an autonomous self-directed manner developing the practices of reflection and lifelong learning	D2 is developed through individual projects encouraging investigation and learning. This is refined at MSc level by individual research for the individual design project and the dissertation.
3 Work in teams	D3 is developed through formal group work in laboratory projects and informal group presentations at Diploma level.
4 Manage time and work to deadlines	D4 is developed through coursework at Diploma level and during the industrially based project at MSc level.
5 Exercise research skills, project management and creativity	D5 is acquired through the individual project and dissertation at MSc level.
6 Analyse problems and use innovation, logical and lateral thinking in their solution	D6 and 7 are developed through projects at both levels.

7 Be flexible and adaptable in the approach to and development of an issue, problem or opportunity	**Assessment**
	Effective communication of ideas (D1) is an important criterion in formative assessment at Diploma level, with regular feedback reports. It is formally assessed as part of the MSc dissertation presentation. D2 and D4 are not formally assessed. D3, D5 and D6 are assessed through projects and dissertation. D7 is not assessed, but feedback is given at the end of projects.

11.Programme structure, features, levels and awards

Level and Exit Award	For students with a BSc, BEng or MEng degree, the programme of study involves nine months full-time study for the diploma and 15 months for the masters.	
4 MSc	Students undertake an individual design project, normally industrially based, and an associated dissertation.	MSc requires a minimum of 50% for the award. Outcomes developed and assessed at this level include: A2, B2, B6, C1-2, D1, D5. The outcomes relate to the topic of the project and dissertation.
4 Post-graduate Diploma	The Diploma involves 2 Core Modules in Computing Applications and Professional Context and 2 further modules relating ED to students' previous specialisation (i.e. aeronautical, electrical/electronic, automotive or mechanical engineering). All students participate in collaborative projects and have the option of undertaking one individual project. Professional Context includes: contract law, clients and contractors, project management, commercial risk, procurement and marketing,	Postgraduate Diploma in ED requires an average of 50% for the award and 60% for progression to MSc. Outcomes developed and assessed include: A1; 3-12; B1; 3-5 and 7; C2-7; D3-6.

	with simulation exercises.	
Post-graduate Cert.	May be awarded to candidates achieving an average of 45%, with no mark less than 38%	

12.Support for students and their learning

A range of workshops and laboratories

Individual, equipped design studio workplace for every student

Library resources: Faculty of Engineering and Science

Computer suite with 17 CAD machines, word processing machines and other University clusters

Regular organised industrial visits and lectures by practising engineers

MSc industry-based project

Access to teaching and learning support services which provide assistance with and guidance on dyslexia and other disabilities

Course catalogue

School Handbook

13. Criteria for admission

An approved degree for the Postgraduate Diploma course and an approved degree, normally with First or Upper Second class honours for MSc.

Those applicants being considered for an offer of a place will normally be invited to interview and asked to provide documentary evidence of their previous education/experience.

Candidates who are not native English speakers must present evidence of proficiency in English

14. Methods for evaluating and improving the quality and standards of teaching and learning

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards

Module and course reviews

Course Committee review

External examiner reports

Validation reviews

Committees with responsibility for monitoring and evaluating quality and standards

Staff-student committee

Course committees

Board of Examiners

Mechanisms for gaining student feedback on the quality of teaching and their learning experience

Staff-student Committee

Student representation on course committees

Questionnaire evaluation of modules and courses

15.Regulation of Assessment

Assessment rules

To qualify for the award of a Postgraduate Diploma, students must complete all the course requirements. A pass mark of 50% applies to the award of Diploma with 60% required for eligibility to proceed to MSc. An overview of assessment details is provided in the School Handbook/Course Catalogue and a full assessment brief is provided within each project brief.

Summary of grades, marks and their interpretation for Diploma

Grade Mark Interpretation

A 70-100% Work of real distinction: has fulfilled all or the majority of the specified learning outcomes to an excellent standard: a very high level of subject mastery and practical/professional skills; notable achievement in the development of intellectual and personal skills.

B 60-69% Work of high merit (eligible to proceed to masters if final mark): has fulfilled all or the majority of the specified learning outcomes to a proficient standard: above average level of subject mastery and practical/professional skills; sound achievement in the development of intellectual and personal skills

C 50-59% Good work: has fulfilled the majority of the specified learning outcomes to a competent standard: a good level of subject mastery and practical/professional skills; satisfactory achievement in the development of intellectual and personal skills

D 45-49% Compensatable fail (applies only to a component of the year's work): has fulfilled the specified learning outcomes to the minimum acceptable level to continue study within that subject and for the award of credit points as a component of the year's work: an adequate standard of subject mastery and practical/professional skills; reasonable achievement in the development of intellectual and personal attributes

E/F 0-44% Outright fail: has fulfilled very few or none of the specified learning outcomes, even at the minimum acceptable level and is not eligible for the award of credit points.

Note: The pass mark for the final mark of the year is 50% and all components must be submitted.

Role of External Examiners

External examiners are proposed by the Head of School in consultation with the Level Co-ordinator and the Dean of the Faculty. The proposal is

scrutinised by the Assistant Registrar (Quality) and submitted to the Vice-Chancellor and Deans Committee for consideration. Details of the appointment are forwarded to Senate for ratification.

Two external examiners are appointed for the PgDiploma and the MSc.

The function of the external examiner is to:

- participate in assessment procedures for the award of diplomas and degrees;
- arbitrate or adjudicate on problem cases;
- comment and give advice on course content, balance and structure, on degree schemes and on assessment processes.

16. Indicators of quality and standards

1994 HEFCE Quality Assessment ‘Satisfactory’

1997 IEE accreditation.