Faculty of Engineering

Postgraduate Student Handbook 2014/15

Faculty Postgraduate Programme in Sustainable Engineering

Leading to the Award of Postgraduate Certificate/Postgraduate Diploma or MSc in Sustainable Engineering:

- Chemical Processing
- Marine Technology
- Offshore Renewable Energy
- Renewable Energy Systems & the Environment
- Sustainable Product Development
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“We do not inherit the earth from our parents we borrow it from our children”.
A Kenyan proverb

I am delighted to welcome you to the Faculty Postgraduate Programme in Sustainable Engineering.

Universities have always fulfilled a central and essential role in society. Today our Universities are undergoing major change as they try to connect their missions and actions to emerging challenges and opportunities that have far reaching political, economic, social and environmental implications. A growing number of higher education institutions are now redefining their core strategies and structures to respond to sustainability as a global challenge for the 21st Century. The contribution of Universities to sustainability is increasingly being expressed in relevant and trans-disciplinary research and knowledge exchange activity, within teaching and learning provision, and in various institutional guidelines and policy statements.

Here at the University of Strathclyde Glasgow we are committed to ensuring that sustainability and responsible citizenship are embedded in all of our operations. We recognise our responsibilities with regard to the principles of sustainable development and recognise our role in exchanging information and good practice, and in stimulating debate across a variety of communities around issues of sustainability. In addition to proposals for enhancing the management and maintenance of the University’s estates through reducing waste, energy use and resource consumption, Strathclyde has embarked upon a number of educational and research initiatives intended to respond specifically to the sustainability agenda. Having launched back in 1999 the flexible multidisciplinary postgraduate programme in Sustainable Engineering has been a pioneer in this respect. The Sustainable Engineering pathways are constructed on a blend of modules, industry-based group projects, and individual project work. Projects are key opportunities for industrial involvement in courses through knowledge exchange and the results of the project work are disseminated at an increasingly well-attended student conference each year.

Designing, modelling, and evaluating performance, in the area of sustainable engineering are tasks that require a variety of abilities and transferable skills dealing with issues of complexity, communication, networking, and the ability to “think outside the box”. We need our future engineers and architects to be creative and flexible, to be curious and imaginative. We believe that by participating in this programme you will develop these attributes, abilities, and skills, and gain a thorough knowledge of modern sustainable engineering issues.

Dr David Grierson
Programme Director, Sustainable Engineering
Sustainable Engineering

Introduction
The University of Strathclyde has existed in various forms in Glasgow since 1796 and is recognised as one of the largest and most important institutions in the field of engineering education and research in the UK. Located in the centre of Glasgow - Scotland’s commercial and industrial capital - it caters for a population of around 13,000 full-time and 1,200 part-time and open-learning students.

Our ambition is to be among the leading technological universities in the world. At Strathclyde, technologies combine the creation and development of materials methods and processes with an understanding of how people and societies around the world use, adapt and respond to these developments in order to meet current and future challenges. A current challenge involves issues surrounding sustainability.

The Faculty of Engineering comprises eight departments, covering all major engineering areas: Architecture, Biomedical Engineering, Chemical & Process Engineering, Civil and Environmental Engineering; Design, Manufacture & Engineering Management; Electronic & Electrical Engineering; Mechanical and Aerospace Engineering; and Naval Architecture & Marine Engineering. It is from this diverse (but complementary) base that the Postgraduate programme in Sustainable Engineering has grown.

The Faculty of Engineering offers a flexible, multidisciplinary postgraduate programme in Sustainable Engineering, leading to the award of Postgraduate Certificate, Postgraduate Diploma or MSc in:

Sustainable Engineering:
- Chemical Processing
- Marine Technology
- Offshore Renewable Energy
- Renewable Energy Systems and the Environment
- Sustainable Product Development

Engineering involves the creative process of turning knowledge of science and technology into products, services, and infrastructure that benefit society. Some of the most challenging tasks for our current society lie in achieving environmental, social and economic developments that are sustainable. We can only achieve this through a combination of changing our behaviour and enhancing our technological capacity. The role of engineering is crucial to this in developing technologies that can help protect the environment while contributing to competitiveness and economic growth.

Sustainable engineering involves the responsible use of energy and resources at a rate, and in a manner, which does not compromise the integrity of the natural environment, or the ability of future generations to meet their own needs. It is concerned with, for example, better and more effective renewable energy sources, reduced energy losses in buildings, new resource efficient production processes, improved life-cycle assessment procedures, and more effective transportation systems and urban planning instruments.

The programme examines such concepts through specialist and generic taught modules, and industry-relevant projects. Teaching methods include lectures, discussions, group work, informal reviews, debating and computer-aided learning.

With input from a range of the Faculty’s departments, the course is a cross-discipline collaboration open to both full- and part-time students wishing to take up careers in industry, and to industrial staff seeking continuing professional development.
The programme comprises three main elements:

**Part A: Modules**
Offered in the first and second semesters (depending on modules selected), a mixture of Faculty-wide and specialist modules address the principles, concepts and issues which underpin a sustainable approach to engineering design. The objective is to inform students about the key issues and technologies relating to their chosen field, and to prepare those who will progress to Part B.

Students take the compulsory module in Sustainability, along with no fewer than two other Faculty-wide optional modules. At least three modules must be taken from the student’s relevant pathway.

On successful completion of six modules a Postgraduate Certificate may be awarded to those who are not continuing further.

**Part B: Group Project**
On successful completion of Part A, students can progress to Part B (valued at 40 PG credits) offered in the second semester. Working in groups, students undertake a project, normally within an industrial test bed or in association with an appropriate design or industrial organisation. Please refer to individual Pathway Directors/Handbooks for details.

**Part C: Individual Project**
On successful completion of Part B, students can either graduate with a Postgraduate Diploma or continue on the MSc route, which entails the production of a dissertation. Part C individual projects (valued at 60 PG credits) would typically entail an in-depth study of an issue (or set of issues) identified from the Part B activities. Please refer to individual Pathway Directors/Handbooks for details.

Successful completion of eight modules, a group project, and a dissertation leads to the award of an MSc.

**Normal Duration of Study**
The normal duration of the MSc course is 12 months for full-time students and 24 months for part-time students while the normal duration for PG Diploma students is 9 months. Candidates may be awarded credits, and have their curriculum reduced accordingly, on the basis of passes obtained in a relevant programme of the University or another institution.

**Admission**
Applicants will normally possess a degree or a professional qualification which is deemed by the University to be equivalent. For those wishing to undertake parts of the course on a non-graduating basis, a first degree is not required.
Curriculum

Part A: Modules

For all pathways this comprises the compulsory module, at least two Faculty-wide optional modules, and at least three from the relevant pathway. For the Postgraduate Diploma/MSc award a total of eight modules must be taken. Each module is valued at 10 PG credits.

The duration of Part A is normally 12 weeks. For most courses Part A is completed within the first semester, but some of the modules will extend into semester two (see timetable for details).

Part B: Group Project

In this element, teams of students, (preferably consisting of students from different pathways) undertake a practical design project normally selected from an approved list (please refer to individual Pathway Directors/Handbooks). Topics for the projects will be discussed and agreed with theme leaders. Where possible, industry attachment is encouraged or the project is undertaken within a real industrial context. Field trips and regular progress reports are an integral part of the process. Students will present their group work at the annual student project conference normally in April.

The duration of Part B is 12 weeks. Progress to Part C is on the basis of the submission of an acceptable group project report and continuous assessment.

Part C: Individual Project

In Part C, students undertake supervised, individual project work, with the award of MSc being made on the basis of an acceptable report/dissertation submission. Please refer to individual Pathway Directors/Handbooks for more information.

Assessment and Examinations

EXAMINATIONS

The pass mark for postgraduate examinations is 50% overall average, with no classes falling below 40% and having a maximum of two classes in the 40-50% band.

Refer to the Course General Regulations for Resit Practice and Progress Procedure, which can be found in Part 3 of the University Calendar 2014/15.

http://www.strath.ac.uk/educationstrategy/gmpt/qualityenhancement/universityregulations/
Contact Information

General information is available on the website at:
http://www.strath.ac.uk/engineering/suseng

or from:

<table>
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<tr>
<th>General enquiries</th>
<th>Programme enquiries</th>
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| Faculty of Engineering  
University of Strathclyde  
RC525, Royal College Building  
204 George Street  
Glasgow G1 1XW  
Scotland, UK  
Tel: +44 (0)141 548 2749  
contact-facultyofengineering@strath.ac.uk | Dr David Grierson  
Programme Director  
Tel: +44 (0)141 548 3069  
d.grierson@strath.ac.uk |

For further information on specific themes:

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<tr>
<th>Theme</th>
<th>Leader</th>
<th>email</th>
<th>Tel No.</th>
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<tbody>
<tr>
<td>Chemical Processing</td>
<td>Mr B Dickson</td>
<td><a href="mailto:brian.dickson@strath.ac.uk">brian.dickson@strath.ac.uk</a></td>
<td>548 4131</td>
</tr>
<tr>
<td>Marine Technology</td>
<td>Prof P Zhou</td>
<td><a href="mailto:peilin.zhou@strath.ac.uk">peilin.zhou@strath.ac.uk</a></td>
<td>548 3344</td>
</tr>
<tr>
<td>Offshore Renewable Energy</td>
<td>Prof P Zhou</td>
<td><a href="mailto:peilin.zhou@strath.ac.uk">peilin.zhou@strath.ac.uk</a></td>
<td>548 3344</td>
</tr>
<tr>
<td>Renewable Energy Systems and the Environment</td>
<td>Dr P Strachan</td>
<td><a href="mailto:paul@esru.strath.ac.uk">paul@esru.strath.ac.uk</a></td>
<td>548 2041</td>
</tr>
<tr>
<td>Sustainable Product Development</td>
<td>Mr M Anusas</td>
<td><a href="mailto:m.anusas@strath.ac.uk">m.anusas@strath.ac.uk</a></td>
<td>548 2852</td>
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### Academic Year 2014/15 - Dates to note

<table>
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<th>Event</th>
<th>Date (Year)</th>
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<tr>
<td>Introductory meeting</td>
<td>25 September 2014 @ 2:00pm (McCance: MC301)</td>
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<tr>
<td>First semester commences</td>
<td>26 September 2014</td>
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<tr>
<td>Student-Staff Liaison Committee Meeting (S1)</td>
<td>19 November 2014 @ 12:30pm</td>
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<td>First teaching period ends</td>
<td>19 December 2014</td>
</tr>
<tr>
<td><strong>University closed</strong></td>
<td>24 December 2014 – 5 January 2015 inclusive</td>
</tr>
<tr>
<td>Second semester commences</td>
<td>26 January 2015</td>
</tr>
<tr>
<td>Student-Staff Liaison Committee Meeting (S2)</td>
<td>Date and time to be agreed</td>
</tr>
<tr>
<td><strong>University closed</strong></td>
<td>03 April - 06 April 2015 inclusive</td>
</tr>
<tr>
<td><strong>University closed</strong></td>
<td>04 May 2015 and 25 May 2015</td>
</tr>
<tr>
<td>Individual projects commence</td>
<td>Date to be agreed with your Pathway Director</td>
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<tr>
<td><strong>University closed</strong></td>
<td>17 – 20 July 2015 inclusive</td>
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<tr>
<td>Individual project/dissertation submission</td>
<td>On or before Friday 25 September 2015</td>
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For confirmation of Key Dates go to: [http://www.strath.ac.uk/studying/currentstudent/keydates/](http://www.strath.ac.uk/studying/currentstudent/keydates/)

*All outstanding University fees etc. must be paid at least 10 working days before date of graduation.*

# Please check with your Pathway Director as submission dates may vary within different Departments.
Regulations for Higher Degrees, Postgraduate Diplomas/Certificates

Students are responsible for keeping themselves up to date with all information sources that may be relevant to their course of study. Information sources include Pegasus, email to @strath accounts, Departmental notice boards, and the University Calendar; the latter includes the regulations for all courses. You should check these information sources regularly as they are updated throughout the year.

The Calendar is published on-line in three parts at: http://www.strath.ac.uk/educationstrategy/gmpt/qualityenhancement/universityregulations/. The three parts are listed below.

Part 1 contains the University Charter, Statutes and Ordinances, together with Regulations 1-7, prize regulations and an Appendix (History of the University, Armorial Bearings, University Chairs and Honorary Graduates).

Part 2A contains Regulations 11-13 covering the course regulations for undergraduate and integrated master’s degrees of the four Faculties and elective classes for students admitted to first with effect from session 2009/10.

Part 2B contains Regulations 15-17 covering the course regulations for undergraduate and integrated master’s degrees of the four Faculties and elective classes for students admitted to first year prior to session 2009/10.

Part 3 contains Regulations 19-30 covering the postgraduate, continuing education and sub-degree courses of the four Faculties.

Changes and restrictions are made from time to time and the University reserves the right to add, amend or withdraw courses and facilities, to restrict student numbers and to make any other alterations, as it may deem necessary and desirable. Changes are published by incorporation in the next edition of the University Calendar.

Any queries about the contents of the University Calendar should be directed to educationstrategy@strath.ac.uk.

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General Regulations for Postgraduate Awards by Instruction

The University’s General regulations for postgraduate awards by instruction can be found in section 19, Part 3 of the University Calendar
PART A: GENERAL GUIDELINES

Progress Requirements and Assessment

1. PGT Boards of Examiners assess students' performance in meeting the progress, transfer and award requirements for all postgraduate taught courses (PgCert, PgDip, MSc and MArch) and also the taught classes of research degrees (e.g. MRes, MPhil, PhD and EngD).

2. Students are required to meet the conditions set down in the general and course regulations. All regulations are published in the University Calendar. The general requirements are contained in Regulations 19.1, 20.1-20.4, and the requirements of individual Faculty courses appear in regulations 19.40 – 19.49. Copies of the relevant regulations are included in course handbooks that are issued to all students on admission to the University.

Boards of Examiners must also comply with the requirements outlined in section 9 of the University “Policy, Procedures and Guidelines” document.

3. Student progress is determined by the accumulation of credits. The pass mark at PGT level (level 5) is 50%.

4. Regulation 19.1.34 confirms that a candidate who satisfies a Board of Examiners in a class will be awarded the number of credits specified for that class.

5. The Faculty of Engineering operates a compensation scheme that can be applied only to a student’s first attempts. It is not used at later Boards unless first attempts are being considered or there are special circumstances. Further details are given in Part B below.

6. The Faculty of Engineering PGT Compensation Scheme applies to all PGT degrees in the Faculty, unless approval has been granted by the Board of Study and Senate for a course to be exempted. Departments that wish to exempt a course from the scheme must submit a request to the Faculty Office in writing, accompanied by appropriate supporting documentation.

7. Examination Boards should note that the University General Regulations for PGT courses state (19.1.37) that candidates for the degree of Master will normally be expected to perform to the satisfaction of the Board of Examiners in the taught components of the course, before being permitted to proceed to the project and/or dissertation. MSc students in the Faculty are therefore required to satisfy paragraphs 20-22 below.

8. PgCert and PgDip students (in contrast to MSc students) may resit once any number of classes, as per University general regulations.

Schedules of Assessment

9. The assessment of scripts is the responsibility of academic staff in the Departments of the Faculty. All scripts, especially those with marks in the range 40%-49%, should be scrutinised before returning the marks to Student Business. In cases where coursework and
examination performance contribute to the student's overall assessment, Departments are required to return the composite mark via Student Business to the Board of Examiners. Student Business transfers returned marks to the Schedules of Assessment for the Examination Boards. Student Business will endeavour to issue the Schedules of Assessment to members of the Board of Examiners at least two working days before the Board is due to meet.

Method of Operation of the Boards of Examiners

13. The Board of Examiners will be chaired by the relevant Head of Department or their nominee.

14. The Board of Examiners will scrutinise the marks that have been set out in the Schedules of Assessment. Course co-ordinators should advise the Board of any amendments that require to be made to the Schedule. It is also their responsibility to recommend to the Board how the Compensation scheme should be applied in individual cases.

15. Generally, a mark of 50% or more in a class is regarded by the Board as a clear pass.

16. A candidate who satisfies a Board of Examiners in a class will be awarded the number of credits specified for that class.

17. Boards of Examiners will make one of the following decisions for all students:

**AWARD** A clear Award. The student has successfully completed all the taught and, if appropriate, the project/dissertation components of his/her degree, diploma or certificate course.

**P** A clear Pass. The student has no re-sits and should proceed to the next year of study (normally only for students who are undertaking the course over more than one academic session).

**MP** May Proceed to Project/Dissertation. The student has normally satisfied all the taught components of his/her course and may proceed to the project/dissertation. (see 20, 21 and 22)

**TM** Terminate. The student will be instructed to withdraw from the course.

**R** Re-sit (May/June Board only). The student should take re-sit examinations in August, after which a decision will be made on possible award of MSc, PgDip or PgCert.

**SL** Unusual circumstances dictate that the student should receive a Special Letter, outlining his/her academic position as determined by the Examiners. In order to avoid unnecessary delay in students’ receiving results, it is preferable that this option only be recorded in exceptional circumstances.

**TF** Transfer. The student will be transferred to another degree, diploma or certificate course in the same group of courses. This may be qualified by the decision of, for example, TF and resit etc.

18. This Board will normally consider the transfer of candidates between PgCert, PgDip and
MSc and progression to the MSc project/dissertation. This Board will also consider any outstanding candidates from the previous academic year.

19. The compulsory and optional classes required by candidates for either progression or award can be found in the relevant course regulations.

20. To proceed to the MSc project/dissertation a candidate will normally have accumulated all the credits on the taught component of the course at the first attempt.

21. With respect to students who have not passed all their credits at the first attempt the Board of Examiners will apply the Faculty PGT Compensation Scheme, if applicable, as outlined in Part B below. If this can be done and the student thereby gains sufficient credits, then the decision will be “Proceed to MSc Project/Dissertation”.

22. MSc students will normally only be allowed to resit a maximum of 10 credits, provided all other taught classes have been passed at the first attempt, with a minimum mark of 50% in each class, and no compensated passes have been awarded. [See, however, paragraph 36 when a student’s credit-weighted average mark is at least 55%].

23. Students who are allowed to proceed to their project/dissertation, under the terms of paragraphs 22 and 36, must be warned that they cannot remain on the MSc course unless all outstanding taught classes are passed at the second attempt. Such students are required to sign a form verifying that they understand and accept the conditions required to remain on the MSc course.

24. MSc students who have failed to achieve the required number of credits on the taught component of the course, under the terms of paragraphs 20-22 will normally be transferred to the PgDip.

25. PgDip students who satisfy the terms of paragraphs 8 and 20-22 and have passed all taught components may be transferred to the appropriate MSc course and proceed to the project/dissertation.

26. Any student who has failed one or more classes will normally be entitled to one further attempt (19.1.19) to obtain enough credits for the award of a PgCert or a PgDip. A student is only entitled to a further attempt at classes for the award of an MSc if he/she satisfies the conditions outlined in paragraph 22.

27. The Board may also consider awards for students who have satisfactorily completed the requirements of the course.

**2nd Examination Board (usually September)**

28. This is the main Examination Board for PGT Courses. Notwithstanding paragraph 27, this Board considers the award of MSc, PgDip and PgCert, and the transfer of students between MSc, PgDip and PgCert. Outstanding issues from the earlier Examination Board will also be considered.

29. Boards of Examiners may allow a thesis/dissertation to be re-submitted only if the original mark is at least 45%, in which case the re-submission must be made before the end of November (in the same calendar year).

**Awards**
30. Where a candidate has accumulated 120 credits of taught classes from the curriculum, together with 60 credits for the project/dissertation, he/she will be awarded an MSc.

b. Where a candidate has accumulated 120 credits of taught classes from the curriculum, but has not obtained 60 credits for the project/dissertation, he/she will be awarded a PgDip.

c. Where a candidate has not accumulated 120 credits of taught classes after 2 attempts, he/she may be considered for a PgCert. The PgCert can be awarded if the candidate has accumulated at least 60 credits of taught classes from the curriculum.

d. A candidate who has accumulated less than 60 credits of taught material after two attempts will be deemed to have failed, and no award will be made.

Awards may be made “with Merit” or “with Distinction”. Examination Boards should have regard to a student’s performance against criteria approved by Senate and consider the composite mark against the following general framework (19.1.49):

<table>
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<tr>
<th>Classification</th>
<th>Composite Mark</th>
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<tr>
<td>Distinction</td>
<td>70 - 100</td>
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<tr>
<td>Merit</td>
<td>60 - 69</td>
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<tr>
<td>Award</td>
<td>50 - 59</td>
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Notwithstanding University General Regulation 19.1.49, **PGT students are eligible for an award with merit/distinction only if they pass all classes at the first attempt.** (This includes any compensated class).

**Medical or Other Adverse Circumstances**

31. Where a student reports medical/personal circumstances that have adversely affected his/her performance, the Department should take account of this and advise Student Business of such mitigating circumstances. Medical or personal circumstances must be notified in writing to Student Business, and must be supported by appropriate documentation, e.g. a medical certificate authenticated by a medical practitioner.

A Faculty Mitigating Circumstances Committee will be convened in advance of the Boards of Examiners to consider cases where a student has reported medical or personal circumstances. This Committee will advise the Boards of Examiners as to how these circumstances may have affected a student's academic performance and will make recommendations to the Board as to whether any special dispensation is required. The Faculty Officer in attendance will ensure that the Committee’s recommendations are reported to the Board.

32. The existence of mitigating circumstances is indicated against a student's record on the Assessment Schedule by (***). The Board may then decide to:

a) discount the student's attempt at one or more examinations

and/or

b) convert a **marginal** fail in one or more examinations into a pass, by raising a mark to 50%.

**Part-Time Registration and Voluntary Suspension**

33. Full-time students, through a mixture of academic or personal pressures, may have entered into part-time registration or voluntary suspension. These students normally appear at the
end of the Schedules of Assessment.

34. **Part-time registration**
   In this case, the student attends or re-attends part-time and pays a sum per credit being studied and examined, as specified by Senate and Court for that year. The clock does *not* stop, in terms of the maximum permitted period of study.

35. **Voluntary Suspension**
   Students in voluntary suspension are held to be in 'good academic standing' but have signalled that they have personal difficulties. With the permission of the Faculty they have been allowed time out. For these students, the clock *does* stop, in terms of the maximum permitted period of study.

**PART B: THE FACULTY PGT COMPENSATION SCHEME**

36. The Faculty operates a compensation scheme that is designed to assist Boards of Examiners to take decisions about student progress to the MSc project/dissertation. The scheme can be applied only to the student's first attempts and, therefore, is normally used only at the May/June meetings of the Boards of Examiners. Marks of N + a mark (i.e. where there is an examination result but missing coursework) are not eligible for compensation.

37. Students who have accumulated at least 120 credits from the course curriculum and who have a credit-weighted average (CWA) of at least **55%** are eligible for compensation. Any combination of classes, up to a maximum of 20 credits, may be compensated (where the class marks are in the range 40-49%) or taken as a resit (where the class marks are below 40%).

   Compensation can be applied to part-time students when they have completed classes totalling at least 60 credits. Students who have accumulated at least 60 credits and who have a CWA of at least **55%** are eligible for compensation. A maximum of 10 credits of classes may be compensated (where the class marks are in the range 40-49%) or taken as a resit (where the class marks are below 40%).

38. Only in circumstances where compensation is not acceptable for professional accreditation will degrees be allowed to deviate from the scheme. In such cases, Departments must provide documentary evidence of the concerns expressed (e.g. a letter from the accrediting body stating that the Department may not apply compensation to specified accredited courses) together with any alternative proposals. Any such modification requires approval by the Board of Study and by Senate.

**CWA: The Calculation**

39. The credit-weighted average (CWA) mark is calculated by adding together all numerical marks from classes of the *standard curriculum* for that year, weighted according to the credit value of the class; this aggregate mark is then divided by the number of credits. If the resulting CWA is 55% or higher then a pass by compensation under the scheme may be considered. The CWA mark should be rounded to the nearest integer, in line with University practice.

40. Returns of E with no mark, F and P are ignored in calculating the average mark and A, OC and N xx are counted as zero. As numerical marks are the norm, any such returns must have been approved by the Board of Study.

41. If a student is absent from a class without an acceptable explanation, a mark of zero is
recorded for the class, and this is included in calculating the total credits that will apply in the assessment of the CWA. Similarly, classes for which the coursework has been assessed as unsatisfactory ('OC' or N plus a mark) are included in calculating the total credits to be used in assessing the CWA but are regarded as having a mark of zero.

42. Where a student has more than one class eligible for compensation, it is recommended that compulsory classes be prioritised for compensation, followed by the class with the highest mark. However, the discretion of the Board of Examiners will ultimately apply.

43. A student passing by compensation will be deemed to have obtained the credit(s) appropriate to the class or classes concerned. The student will be notified of the classes passed by compensation. The actual mark will appear on the student's transcript as well as an indication of pass by compensation (thus: Mark + P).

(Draft Feb 07 RC)
(Revised May 07 RC)
(Revised May 11 OLW)
(Revised Aug 11 PGS)
(Revised Feb 13 PGS - in line with FMT & AAC)
### Sustainable Engineering

**2014/15**

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<td><strong>Monday</strong></td>
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<td>Week 10</td>
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<tr>
<td>Week 11</td>
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<tr>
<td>Week 12</td>
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</table>

**Pathway Modules**

- Design Management (09:00 – 11:00)
- Sustainability (11:00 – 13:00)
- Information Management (13:00 – 15:00)
- Project Management (15:00 – 17:00)

**Student-Staff Liaison Committee Meeting – 19 November 2014**

**Departmental Introduction to Group Projects**
<table>
<thead>
<tr>
<th>Week</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Field Trips*</td>
<td>Student-Staff Liaison Committee Meeting – Date and time to be agreed</td>
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<tr>
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<td>Group Project/Pathway Modules</td>
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<tr>
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<td>Group Project/Pathway Modules</td>
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<tr>
<td>4</td>
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<td></td>
<td>Knowledge Engineering and Management for Engineers (09:00 – 11:00)</td>
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<tr>
<td>5</td>
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<td>Financial Engineering (11:00-13:00)</td>
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<tr>
<td>6</td>
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<td></td>
<td>Environmental Impact Assessment (13:00 – 15:00)</td>
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<tr>
<td>7</td>
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<td></td>
<td>Risk Management (15:00-17:00)</td>
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</tbody>
</table>

* Note: Field trips may not run on all courses.
Part A: Module Descriptors

Generic Modules

The following module descriptors are provided overleaf:

Compulsory

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB 975</td>
<td>Sustainability</td>
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</tbody>
</table>

Faculty-Wide Options

<table>
<thead>
<tr>
<th>Module</th>
<th>Title</th>
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<tbody>
<tr>
<td>EV 939</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EF 927</td>
<td>Design Management</td>
</tr>
<tr>
<td>EF 929</td>
<td>Financial Engineering</td>
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<td>EF 930</td>
<td>Information Management</td>
</tr>
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<td>EF 931</td>
<td>Project Management</td>
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<td>EF 932</td>
<td>Risk Management</td>
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<tr>
<td>DM 930</td>
<td>Knowledge Engineering and Management for Engineers</td>
</tr>
</tbody>
</table>
MODULE DESCRIPTION FORM

AB 975 Sustainability

Module Registrar: Dr David Grierson
Taught To (Course): Sustainable Engineering Programme

Other Lecturers Involved: na
Credit Weighting: 10
Semester: 1

Assumed Prerequisites: na
Compulsory class
Academic Level: 5

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
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<tr>
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<td>10</td>
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<td></td>
<td>20</td>
<td>50</td>
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</tbody>
</table>

Educational Aim

This module aims to provide students with an understanding of the concepts of sustainability and sustainable development. The social, environmental, and economic impact of development strategies will be identified and the mitigation of negative impacts discussed.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1: understand the concept of social, environmental and economic sustainability
LO2: discuss population, urban, and economic growth strategies and their impacts

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Syllabus

The module will cover the following:

- Shifting world views with respect to technology and ecology
- Green politics
- Green theoretical perspectives
- Climate change
- Sustainable development
- Limits to growth (people, economies & cities)

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

[Note: Criteria break the LO down into ‘teachable’ elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]

LO1
C1: Ability to demonstrate an understanding and knowledge of social, environmental and economic sustainability
C2: Evidence of good structure, analysis and argument, and presentation skills in a written submission

LO2
C1: Provision of individual contributions to online discussions in response to the module resources provided
C2: Contribution to and articulation of an agreed group position on specific aspects of the class syllabus
C3: Support and contribution to debate on an agreed position at scheduled group seminar sessions

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/)

The module is VLE-based and blends traditional lecture presentations supported by online resources with structured online discussions on specific topics, and face-to-face themed seminars. Assessment is based on the student’s contribution to the discussion forum, participation at the group seminars, and the submission of a topic-based position paper demonstrating an understanding of sustainability and sustainable development.

Since students taking the class are from various disciplines, nationalities, and cultures, and have varying experiences with respect to sustainability issues, interaction and dialogue around key aspects of the syllabus (both online and face-to-face) is prioritised within the module. The discursive approach exposes students to alternative perspectives and allows them to support one another’s learning. Students are encouraged to provide feedback (peer discussion) to each other on specific topics, goals, and criteria leading to an agreed position within a seminar group. Comments posted by students online are used by the lecturer in subsequent sessions to promote dialogue. The articulation of an agreed group position around defined seminar themes allows the student to identify their own topic for the individual position paper submission, providing them more control over aspects of their learning and increases motivation. The assessment criteria and the timing of the paper submission is discussed and agreed with the students in advance of submission.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>L/Outcomes</th>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tr>
<td>Number</td>
<td>Duration</td>
<td>Weighting</td>
<td>Number</td>
</tr>
<tr>
<td>LO1 and LO2</td>
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</table>

*Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.*

Coursework / Submissions deadlines:
Discussion Forum (throughout semester)
Group Seminars (weeks 8, 9, 10)
Position Paper (within exam period - agreed with students)

Resit Assessment Procedures:
Resubmission of coursework

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of coursework.
Recommended Reading

Bookchin, M. Remaking Society (Black Rose Books, Montreal and New York, 1989)
Fox, W. Towards a Transpersonal Ecology; Developing New Foundations for Environmentalism (Green Books Ltd, Devon, 1995)
Kuhn, T. The Structure of Scientific Revolutions (Houghton Miflin, New York, 1962)
MacKay, D.J.C. Sustainable Energy: without the hot air (UIT Cambridge, 2009)

Additional Student Feedback
(Please specify details of when additional feedback will be provided)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
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<tbody>
<tr>
<td>as agreed</td>
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<td>JW302m</td>
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</table>

Session:

Approved:

Course Director Signature:

Date of Last Modifications:

(Updated November 2010)
**MODULE TIMETABLE**

**Module Code:** AB975  
**Module Title:** Sustainability

**Brief Description of Assessment:**
Assignment 1: Contribution to Discussion Forum  
Assignment 2: Contribution to Group Seminar  
Assignment 3: Position Paper

**Assessment Timing:**
Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
<th>WK6</th>
<th>WK7</th>
<th>WK8</th>
<th>WK9</th>
<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
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<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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<th>Exam Period</th>
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</table>
Module Code: EV939
Module Title: Environmental Impact Assessment

Module Registrar: Dr Elsa João, Senior Lecturer; Tel.: 0141 548 4056; email: elsa.joao@strath.ac.uk.

Other Lecturers Involved: Some contributions from external practitioners

Credit Weighting: 10
Semester: 2

Compulsory(optional/elective class: Compulsory to: MSc in Environmental Engineering
Optional to: MEng Civil Eng 5th Year; MSc Environmental Science; MSc Sustainability & Environmental Studies; MSc Global Water Sustainability; MRes Geo-Environmental Engineering; MRes IPPC; MRes Climate Change Adaptation; MSc Sustainable Engineering

Academic Level: 5

Prerequisites: None

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Assignments</th>
<th>Field visit</th>
<th>Private Study</th>
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General Aims

Environmental impact assessment (EIA) relates to the process of identifying, evaluating, and mitigating the biophysical, social, economic, cultural and other relevant effects of development proposals prior to major decisions being taken and commitments made. This module aims to provide students with an introduction to some of the methods used to predict environmental impacts, and to see how these may be used to integrate environmental factors into decisions. The module emphasises the use of EIA as a design tool and focuses on issues related to the quality of the EIA process overall and of Environmental Impact Statements in particular. The module draws principally on the UK planning context of environmental impact assessment (also called Environmental Assessment), but also takes account of EIA experience in other countries and international organisations, together with developing international experience of Strategic Environmental Assessment (SEA).
Specific Learning Outcomes

Knowledge and Understanding
On completion of the module students should:
• be conversant with the regulatory requirements for statutory EIA;
• be familiar with some of the methodologies commonly used in preparing EIA, including public participation;
• understand the relationship between EIA and development decisions;
• understand the ways in which EIA can contribute to sustainable development and its limitations in this regard; and
• be familiar with issues regarding the links between EIA and SEA.

Disciplinary/Professional skills
• learn how to evaluate the quality of an Environmental Impact Statements using the criteria used in the UK by the Institute of Environmental Management and Assessment (IEMA).
• Sound knowledge and skills portfolio on EIA that can be offered and utilised in environmental and engineering consultancies, local government and environmental regulators.

Transferable skills
• Research skills and report writing
• Communicate effectively (written, verbal and graphic)
• Time management and ability to work independently
• Team-working & building

Syllabus
The course will be taught using a combination of lectures, group discussions, seminars, case studies and presentations by practitioners.

The module requires the completion of the following parts (although some of the guest speakers may change every year):
• Week 1 - Intro to the course. Introduction to Environmental Impact Assessment (EIA). The quality of Environmental Impact Statements (EIS). Discussion on the Institute of Environmental Management and Assessment’s criteria for evaluating EIS. (Dr Elsa João).
• Week 2 - Carrying out an EIA – key methods. Key implementation problems of the EIA process. Discussion on the principles of EIA best practice. (Dr Elsa João).
• Week 3 - The EIA of the M74 road extension in Glasgow (Anna McLauchlan, Research Student, David Livingstone Centre for Sustainability, Civil Engineering).
• Week 4 - EIA in the developing world (Isobel Stanley, Technical Director, Edge Consultants)
• Week 5 - Nature conservation, legal designations and wildlife law (including the Habitats Directive) and their links to EIA. (Dr Paul Walton, Species and Habitats Policy Officer, RSPB Scotland).
• Week 6 - SNH Students’ Seminar: Planning, Landscape & the Natural Heritage [For MSc students only.]
• Week 7 - Lecture and workshop on the key principles of Strategic Environmental Assessment (SEA) and how it relates to EIA. (Dr Elsa João)
• Week 8 - EIA of the Black Law Windfarm. (Dr Simon Zisman, RPS Group Plc)
• Week 9 - What is the value of EIA? (Dr Ross Marshall, Environment Agency).
• Week 10 - Consultation and public participation in EIA. Uncertainty and subjectivity issues. Data issues for EIA. The importance of scale issues. The case for scale guidelines. (Dr Elsa João).
• Week 11 - Talk about the field visit to be carried out.
• Week 12 - Field Visit [exact case study changes every year as it requires the visit of site that is either about to being developed or one that is still being built]
Assessment Method(s) Including Percentage Breakdown and Duration of Exams

Criteria for assessment
The course will be assessed by have two assignments only (i.e. there is no exam):

Assignment 1 (contributes to 30% of the final mark) – GROUP WORK
Working in groups of two, write a report, not exceeding 2000 words in length, evaluating the quality of a given environmental impact statement using the criteria used by the IEMA.

Assignment 2 (contributes to 70% of the final mark) – INDIVIDUAL WORK
The following essay, not exceeding 3000 words in length:

Evaluate the extent to which biased evaluations, narrow boundaries, data gaps and/or simplifying assumptions are affecting the legitimacy of the EIA process, and propose reforms to existing policy that would help overcome such problems. [Please note that it is crucial that you illustrate your answer with case studies drawn from guest speakers’ presentations, the literature, environmental impact statements (EIS) studied and/or field visit.]

Please note the following advice in relation to the assignment 2:

a) Essays should combine academic and applied discussion and analysis. In relation to academic content, the essay should draw on the wider literature and should include supporting references. In relation to applied content, the essay should draw upon experience derived from real examples and case studies to illuminate issues of wider relevance.

b) It is crucial that you select key issues that you deem to be significant and present them clearly and persuasively. Your introduction should explain and justify your choice.

c) Your mark for this assignment will reflect:
   1. The extent to which your essay directly addresses the essay topic.
   2. Your selection of the key issues that you deem to be significant.
   3. The structure, logic and clarity of your argument.
   4. Evidence of a critical approach to the topic (rather than a descriptive approach).
   5. How well referenced the essay is.
   6. Use of case study material.
   7. The depth of understanding of the subject area – this will be done partly by reference to choice of issues, but more importantly by the way in which those issues are addressed and the connections drawn in the argument.

d) Note that the assessment of point 7 above is only possible for essays that are clear, well argued and well structured, i.e. even if you have a highly developed understanding of the EIA process, a poorly argued essay will obscure this from the marker.

e) Please impose an explicit structure by having sub-headings that are closely linked to the overall argument of your essay (N.B. 1st section is the “introduction” and the final is the “conclusions”).

f) The essay should be well referenced and include references not only from books but also from papers published in international refereed journals. Therefore, one of your main sources of information must be the database GEOBASE: www.lib.strath.ac.uk/artsweb/GEOGDB.htm

<table>
<thead>
<tr>
<th>Examination</th>
<th>Duration</th>
<th>Weighting %</th>
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<tbody>
<tr>
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<td>No. of Assignments</td>
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<tr>
<td>(1) Groupwork</td>
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<tr>
<td>(2) Individual essay</td>
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Resit Examinations: Essay with a new topic.
Core Reading (further reading will be provided in class)


### Level of Achievement Statement for a JBM Accredited Engineering Module

**Module Code:** EV939  
**Environmental Impact Assessment**

**University of Strathclyde, Department of Civil Engineering**

<table>
<thead>
<tr>
<th>Level in Degree Programme (years 1 to 5)</th>
<th>Module Objectives and/or Principal Outcomes in Support of the Level</th>
<th>Evidence of Achievement (e.g. examination script, design report, dissertation, lab. report, etc.)</th>
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</thead>
<tbody>
<tr>
<td>:5</td>
<td></td>
<td>Group Work - Working in groups of two, students are required to write a report, not exceeding 2000 words in length, evaluating the quality of a given environmental impact statement using the criteria used in the UK by the Institute of Environmental Management and Assessment (IEMA) (30%)</td>
</tr>
<tr>
<td><strong>ECEUK Level (Levels 6 or 7 appropriate to years 4 and 5 resp.)</strong></td>
<td><strong>Knowledge and Understanding</strong></td>
<td>Essay discussing critically how biased evaluations, narrow boundaries, data gaps and/or simplifying assumptions might be affecting the legitimacy of the EIA process, and propose reforms to existing policy that would help overcome such problems (70%)</td>
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<td>Critical understanding of some of the methods used to predict environmental impacts (including public participation) and how these may be used to integrate environmental factors into decisions.</td>
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<td>Critical understanding of the regulatory requirements for statutory EIA.</td>
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<td>Evaluate the key implementation problems of the EIA process.</td>
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<td>Appreciation of how EIA can be used as a design tool in development and civil engineering projects.</td>
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<td>Evaluate issues related to the quality of the EIA process overall and of Environmental Impact Statements in particular.</td>
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<td>Critical understanding of data issues for EIA, including uncertainty, subjectivity and the importance of scale issues.</td>
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<td>Understand the relationship between EIA and development decisions.</td>
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<td></td>
<td>Evaluate the ways in which EIA can contribute to sustainable development and its limitations in this regard.</td>
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<td>Understand key principles of strategic environmental assessment (SEA) and how it relates to EIA.</td>
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<td><strong>Intelectual Abilities</strong></td>
<td>As above</td>
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<td>The course covers a wide range of spatio-temporal scales. Temporal scales range from short-term (e.g. construction impacts of less than a year) to long term (e.g. operational and decommissioning impacts of 20 or more years). Spatial scales cover national, regional and local. Also environmental effects considered need to include: secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects.</td>
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<td></td>
<td><strong>Practical Skills</strong></td>
<td>Group work evaluating the quality of an EIS.</td>
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<tr>
<td></td>
<td>Learn how to evaluate the quality assessment of an Environmental Impact Statement using the criteria used in the UK by the Institute of Environmental Management and Assessment (IEMA).</td>
<td>Field visit.</td>
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<tr>
<td></td>
<td>Take part in a field visit of site that has been subject to an EIA and that is either about to being developed or one that is still being built. Practical skills in analyses and interpretation of data. Research skills and methods</td>
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<tr>
<td>General Transferable Skills</td>
<td>Research skills</td>
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<tr>
<td>IT skills</td>
<td>Research skills</td>
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<tr>
<td>Report-writing</td>
<td>Skills in literature review, analysis, synthesis, and report writing</td>
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</tr>
<tr>
<td>Sound knowledge and skills portfolio on EIA that can be offered and utilised in environmental and engineering consultancies, local government and environmental regulators.</td>
<td>Numeracy and data manipulation</td>
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<td></td>
<td>Communicate effectively (written, verbal and graphic)</td>
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<td></td>
<td>Time management and working to deadlines</td>
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<td>Ability to work independently</td>
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<td>Team-working &amp; building</td>
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<td>Strategic planning skills - forward thinking and thinking across disciplinary boundaries.</td>
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<td>Student interaction is encouraged throughout the class through directed reading, student-led question sessions &amp; structured feedback</td>
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<td>Ability to plan, conduct and report on specific research topics</td>
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<td>Critical analysis and evaluation</td>
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<td>Reasoned argumentation and explanation</td>
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<td>Familiarity with electronic information resources</td>
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</table>

**SPECIFIC LEARNING OUTCOMES IN ENGINEERING**

| Underpinning Science and Mathematics | Understanding of underlying physical and chemical principles and processes that govern environmental quality, human health, deterioration of cultural heritage including architectural and archaeological heritage. |
| Engineering Analysis | Understanding that the consideration of environmental impacts early in the development of engineering projects will allow for a better identification of suitable (and unsuitable) locations for development and a better assessment of options. |
| Economic, Social and Environmental Context | Class focuses on EIA and therefore covers all these aspects: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage and landscape. |
| Design | Students learn that EIA, if used early rather than an after-thought, it can be used as a design tool by minimising impacts of development and civil engineering projects or by providing enhancement. |
| Engineering Practice | Through the involvement of practitioners in the field (from environmental consultancies, NGOs, local authorities) current practice is introduced to students. |
Module Registrar: Prof A Duffy
Taught To (Course): Postgraduate Courses

Other Lecturers Involved: R MacLachlan, W Ion
Credit Weighting: 10
Semester: 1

Assumed Prerequisites: None
Compulsory/Optional/Elective class: Academic Level: 5

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Private Study</th>
<th>Total</th>
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<tbody>
<tr>
<td>24</td>
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</tbody>
</table>

Educational Aim
To provide a structured introduction to the Design Management process, issues and tools.

Learning Outcomes
On completion of the module the student is expected to be able to

LO1 Appreciate and understand the role of design within an organisation and the organisational structures required for effective design.
LO2 Appreciate the role of design models, approaches and methods
LO3 Know a variety of aspects and the complexities of design development
LO4 Appreciate the role of innovation in design and know how to measure design performance

Syllabus
The module will teach the following:

- Background and design for competitiveness and sustainability.
- Integrated Product Development, and different approaches and aspects to design development including concurrent engineering, team engineering, product management, design management, distributed design, and decision support.
- The design activity, methods and process models including role of the market, specification, conceptual and detail design
- Basic team and management structures (organisation)
- Key issues related to design complexities (e.g. relating to the people, processes, resources, product, key considerations, knowledge and information, decision making) and the key aspects of design co-ordination
- Design performance and innovation

Assessment of Learning Outcomes
For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning

LO1 Appreciate and understand the role of design within an organisation and the organisational structures required for effective design.
C1 Ability to articulate the impact of early product delivery with regards to quality, cost and market sales
C2 Describe the different main organisational structures and their impact on the design activity

LO2 Appreciate the role of design models, approaches and methods
The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(On Learning & Teaching web pages: [www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/](http://www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/))

12 principles relating to the assessment and feedback developed by the University will be incorporated in the feedback and assessment of the module, primarily through the following key implementations:

- Interactive learning in class to ensure student comprehension of key concepts.
- A detailed list of the criteria and weightings used in the assessment process will be included in assignment handouts.
- Provision of timetabled “feedforward” sessions to allow students to gain feedback against the assessment criteria on their prepared coursework solutions prior to the submission of their solutions.
- Feedback against assessment criteria will be provided to the students once the grading process has been completed.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Duration</td>
<td>Max Marks</td>
</tr>
<tr>
<td>L/Outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Coursework / Submissions deadlines:

Resit Assessment Procedures:

Students need to gain a summative mark of 50% to pass the module. Non graduating students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of coursework.

Recommended Reading


Additional Student Feedback
(Please specify details of when additional feedback will be provided)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday S2 Wk 3</td>
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Session:
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</tr>
</thead>
<tbody>
<tr>
<td>Course Director Signature:</td>
</tr>
<tr>
<td>Date of Approval:</td>
</tr>
</tbody>
</table>
**MODULE TIMETABLE**

**Module Code:** EF927  
**Module Title:** Design Management

**Brief Description of Assessment:**

To present a coherent review of a body of work specified by the lecturer. This involves searching, gathering and studying the area of work and developing a coherent summary covering all the main issues and key ideas. The presentation should at least highlight: what is the basic problem(s) being tackled in the body of work; the key issues, approaches and/or solutions; how the basic problem(s)/work is tackled; and the work relates within the relevant field. Students have to make a group presentation as well as submitting a written “executive summary” document. Assessment for each individual student is based upon 30% for the Executive Summary, 40% for the topic coverage/content, 20% for visual presentation skills, and the remaining 10% allocated for the overall performance of the group.

Note: Students are expected to participate in inter-active class question and answering, impromptu class presentations, and open but focussed dialogue. Failing adequate participation and demonstration of subject knowledge may result in formal examination or presentation/demonstration assessment.

**Assessment Timing:**

Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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<th>WK6</th>
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<td></td>
<td>Group and topic assignment</td>
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<td>Week 14 Wednesday 12 noon Submission and Week 15 presentation</td>
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</table>

<table>
<thead>
<tr>
<th>Semester Two</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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</tbody>
</table>
Module Code: EF 929
Module Title: Financial Engineering

Module Registrar: Dr Girma Zawdie

Other Lecturers Involved: Credit Weighting: 10 Semester: 2

Compulsory/optional/elective class: Academic Level: PG

Prerequisites: None

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Assignments</th>
<th>Laboratories</th>
<th>Private Study</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>24</td>
<td>10</td>
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</tr>
</tbody>
</table>

General Aims

The module aims to introduce elements of financial engineering that are applied to reduce risk of business insolvency and enhance the financial robustness of business enterprises. To this end, the module covers the essentials of Financial Engineering both as an academic discipline and as a strategy of risk management and business development. Recent trends in corporate business behaviour in major industrialized countries have heightened concern with issues of corporate governance, corporate ethics, financial strategies and the role of the financial engineer. Central to this concern is the aim of ensuring the solvency and sustainability of business ventures. In exploring the way forward, business enterprises often consider organisational and management options that would enable them to enhance their position of competitiveness and solvency under uncertain and risky market conditions. What is the best strategy for survival and growth? What are the options for financing investment projects both in the private and public sectors of an economy? How would the financial engineer propose to combine loan capital and equity capital to raise funds for an investment initiative; and how would he/she advise his/her company/organization to build its investment portfolio to ensure financial security in volatile market conditions? These are some of the major issues the financial engineering module takes on board.

Specific Learning Outcomes

Upon successful completion of this module, the student will be able to:

✓ Identify and analyse issues arising from the financial accounts and reports of companies
✓ Evaluate investment decisions
✓ Identify and evaluate sources and methods of raising finance
✓ Analyse the principles underlying operation of financial/capital markets
✓ Identify and evaluate financial strategies and instruments for corporate risk management
✓ Identify the various risks involved in the construction business and evaluate the implications for financial strategies
✓ Evaluate the financial viability of risk transfer options available to PFI projects in terms of cost-benefit analysis.
Syllabus

Introduction to the credit
 ✓ Elements of Financial Accounting
 ✓ Financial Reports: Balance sheets, income statements, Financial Ratios
 ✓ Financial assets and asset valuation
 ✓ Sources of project finance
 ✓ Capital structure and gearing
 ✓ Financial engineering of capital projects
 ✓ Influence of the stock market on Engineering firms
 ✓ Cases in business failures
 ✓ The PFI Debate
 ✓ Investment decisions, financial instruments and portfolio risk management
 ✓ Restructuring strategies - acquisitions and mergers

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>Examination</th>
<th>Duration</th>
<th>Weighting %</th>
</tr>
</thead>
<tbody>
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<td>No. of Assignments</td>
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</table>

Coursework / Submissions deadlines:
To be arranged

Resit Assessment Procedures:

Recommended Reading

Department of Design, Manufacture and Engineering Management

MODULE DESCRIPTION FORM

EF930  Information Management

Module Registrar:  Professor A Duffy  Taught To (Course):  PG

Other Lecturers Involved:  Dr Andrew Lynn, Dr Iain Boyle
Credit Weighting:  10  Semester:  1

Assumed Prerequisites:  None  Compulsory/Optional/Elective class:  Academic Level:  5

Module Format and Delivery (hours):

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<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Private Study</th>
<th>Total</th>
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<td>24</td>
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</tbody>
</table>

Educational Aim

This module aims to give students an understanding of the types of different approaches, techniques and systems used in building information based systems. In particular to:

- Introduce students to the software engineering process, identifying information requirements and visual modelling.
- Acquire a basic understanding of information storage, retrieval, and systems.
- Provide an appreciation and basic skills in the process of developing information systems.
- Familiarise students with information technology, how to model and use information and in introduction into a way of representing information on a computer based system.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1  Identify information requirements and model information in a readily recognised way.
LO2  Design and model platform independent information.
LO3  Develop and implement an appropriate information system to meet the identified information requirements.
LO4  Delivery and report the development of an information system.
LO5  Discuss key aspect of information management.

Syllabus

Introduction; information systems; reasons for centralised information, information input and retrieval; information modelling process and techniques, databases as an information resource; information normalisation; information system development process; visual modelling; information requirements; information structure and organisation; information retrieval; web-based information systems; integration of information systems.

Assessment of Learning Outcomes

Criteria

LO1  Identify information requirements and model information in a readily recognised way.
C3   Appreciate and understand the role of information management for suitable information requirements.
C4   Understand the structures, logic and formalisms required for effective knowledge visualisation.
LO2  Design and model platform independent information.
C5 Demonstrate an appreciation of modelling and optimising information irrespective of a computational system.
C6 Demonstrate knowledge of the information system design and development process.
C7 The level of implementation of an appropriate information system.
C8 Demonstration of the quality of reporting the above.
C9 Demonstrate knowledge of key features of information management.

LO3 Develop and implement an appropriate information system to meet the identified information requirements.

LO4 Delivery and report the development of an information system.

LO5 Discuss key aspects of information management.

LO6 Demonstrate knowledge of the information system design and development process.

LO7 The level of implementation of an appropriate information system.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: [www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/](http://www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/))

12 principles relating to the assessment and feedback developed by the University will be incorporated in the feedback and assessment of the module, primarily through the following key implementations:

- Interactive learning in class to ensure student comprehension of key concepts.
- A detailed list of the criteria and weightings used in the assessment process will be included in assignment handouts.
- Provision of timetabled “feedforward” sessions to allow students to gain feedback against the assessment criteria on their prepared coursework solutions prior to the submission of their solutions.
- Feedback against assessment criteria will be provided to the students once the grading process has been completed.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
</tr>
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<td><strong>Max Marks</strong></td>
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<tr>
<td></td>
<td></td>
<td>LO1, LO2, LO3, LO4, LO5</td>
</tr>
</tbody>
</table>

Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:

Resit Assessment Procedures:

Students need to gain a summative mark of 50% to pass the module.

Students are expected to participate in interactive class question and answering, impromptu class presentations, and open but focussed dialogue. Failing adequate participation and demonstration of subject knowledge may result in formal examination or presentation/demonstration assessment.

Recommended Reading

Lab view Manual

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
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<tbody>
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<td>Courses Director Signature:</td>
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<tr>
<td>Date of Approval:</td>
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</tbody>
</table>
### MODULE TIMETABLE

**Module Code:** EF930  
**Module Title:** Information Management

**Brief Description of Assessment:**
Design, develop and implement an information system (database), to critically review research within the field of information management, and to model an information system from process and object-oriented perspectives.

**Assessment Timing:**
Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
<th>WK6</th>
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<th>WK8</th>
<th>WK9</th>
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<table>
<thead>
<tr>
<th>Semester Two</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
<th>WK5</th>
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<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
<th>Exam Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CW1a: due Wednesday 12pm</td>
<td>CW2: due Wednesday 12pm</td>
<td>CW1b: due wk 13 Tuesday @ 12noon</td>
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</table>
MODULE DESCRIPTION FORM

EF 931 Project Management

Module Registrar: B Dickson
Taught To (Course): Faculty wide Module

Other Lecturers Involved: Credit Weighting: 10
Assumed Prerequisites: Semester: 1
optional class
Academic Level: 5

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Assignment</th>
<th>Private Study</th>
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<td>36</td>
<td>10</td>
<td>30</td>
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</tr>
</tbody>
</table>

Educational Aim

This module aims to provide students with skills relating to the use of engineering practices in Project Management with particular respect to the effective and efficient use of resources.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1 Demonstrate practical skills so that they are able to outline the scope of managing projects and the importance of completing projects on time, to an agreed quality and cost without excess use of resources.

LO2 Gain intellectual skills so that they are able to demonstrate understanding of project network methods and demonstrate familiarity with industry standard project planning software.

LO3 Develop an understanding of the inter-dependency between project estimating and project control and cost management.

LO4 Understand the basis of contract law, the different types of contract and when they are used.

(UKSpec suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Syllabus

A statement on the range of learning

Introduction to Project management techniques and project control.
Basic aspects of project teams; project scope of work; network related management techniques; project features; project constraints and resources; quality assurance and document control.
Project networks: definition of events; activities and nodes; precedence networks and "activity on node" method; analysis of critical path.
Procedural and Graphical presentation techniques that are used as industry standard planning packages.
Introduction to Contract Law: formation of contract; validity; terms of the contract; breach of contract; agency; company contracts.
Project Budgetary control including cash flow, financial borrowing and investment.

Assessment of Learning Outcomes
Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning [Note: Criteria break the LO down into ‘teachable’ elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]

LO1
C1 Be able to interpret a project specification
C2 Prepare a bid document that demonstrates the effect & efficient use of project resources
C3 Be able to understand the dynamics of managing specialists in a multi-disciplinary project team

LO2
C1 Complete a project work schedule and network analysis
C2 Plan the allocation of resources

LO3
C1 Be able to modify an original project plan to cope with changing circumstances
C2 Reallocate resources efficiently in the light of project variations
C3 Understand the effect project variations will have on the project contract and the client/contractor relationship

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tr>
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<td>Duration</td>
<td>Weighting</td>
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</tbody>
</table>

LO1

Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:

End of Presentation and end of Group work

Resit Assessment Procedures:

Individual assignment

PLEASE NOTE:

Recommended Reading

Course notes and provided references
Industrial based case studies

Date of Last Modifications: 10/2/11
(Updated August 2009)
## MODULE TIMETABLE

**Module Code:** EF 931  
**Module Title:** Project Management

**Brief Description of Assessment:**  
Group work completing a project simulation exercise where marks are awarded based on the effective use of resources  
Individual essay reflecting on best project management practice

**Assessment Timing:-**

Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<th>Semester One</th>
<th>WK1</th>
<th>WK2</th>
<th>WK3</th>
<th>WK4</th>
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<th>WK12</th>
<th>Exam Period</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group project commences</td>
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<td></td>
<td>Group project complete</td>
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<table>
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<th>WK2</th>
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</tbody>
</table>
Module Registrar: Professor A Duffy

Taught To (Course): DMEM UG and PG Courses

Other Lecturers Involved:

Credit Weighting: 10

Semester: 2

Assumed Prerequisites: None

Compulsory/Optional/Elective Class: Academic Level: Five

Module Format and Delivery (hours):

<table>
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<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Private Study</th>
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<td>12</td>
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</table>

Educational Aim

This module aims to give students an understanding of the types of knowledge, techniques and systems used in building knowledge based systems and to discuss the application of these techniques.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1 Demonstrate knowledge and understanding of Knowledge Management
LO2 Demonstrate knowledge and understanding of Knowledge Models and Methods
LO3 Demonstrate knowledge and understanding of Knowledge Engineering and Development Processes

Syllabus

The module will teach the following in the context of examples related to Knowledge Engineering;

- Introduction to knowledge
- Expert Systems and Knowledge Based Systems development process
- Knowledge elicitation and acquisition.
- Knowledge representations
- Reasoning, chaining and searching.
- Uncertainty techniques.

Assessment of Learning Outcomes

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning

LO1 Demonstrate knowledge and understanding of Knowledge Management
C10 Appreciate and understand the role of knowledge management for suitable problem solving
C11 Understand the structures, logic and formalisms required for effective knowledge management

LO2 Demonstrate knowledge and understanding of Knowledge Models and Methods
CO1 Appreciate the different types of knowledge, reasoning and uncertainty approaches
CO2 Appreciate the role of knowledge models, methods and tools for suitable problems

LO3 Demonstrate knowledge and understanding of Knowledge Engineering and Development Processes
CO1 Understand the knowledge engineering and development process of knowledge based systems
CO2 Demonstrate logical understanding, clarity and insight in knowledge engineering

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.
12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/)

12 principles relating to the assessment and feedback developed by the University will be incorporated in the feedback and assessment of the module, in particular:

- Interactive learning in class to ensure student comprehension of key concepts.
- A detailed list of the criteria and weightings used in the assessment process will be included in assignment handouts.
- Provision of timetabled “feedforward” sessions to allow students to gain feedback against the assessment criteria on their prepared coursework solutions prior to the submission of their solutions.
- Feedback against assessment criteria will be provided to the students once the grading process has been completed.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Duration</td>
<td>Max Marks</td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>1</td>
<td>100</td>
<td>LO1, 2 and 3</td>
</tr>
</tbody>
</table>

Coursework / Submissions deadlines:
Monday of Week 12 at 12 noon.

Resit Assessment Procedures:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be if appropriate re-examined during the August diet. This re-examination will consist of a formal examination or presentation/demonstrations assessment.

Recommended Reading
Barr and Feigenbaum: “Handbook of Artificial Intelligence”.

Additional Student Feedback
(Please specify details of when additional feedback will be provided)

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<tr>
<th>Date</th>
<th>Time</th>
<th>Room No</th>
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<tr>
<td>Thursday Wk 14</td>
<td>3.00-4.00pm</td>
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</table>

Session:

APPROVED

Course Director Signature: Dr A Thomson

Date of Last Modifications: 28 September 2012
Module Code: DM930  
Module Title: Knowledge Engineering and Management for Engineers

**Brief Description of Assessment:**

The class is assessed on performance in developing and presenting a knowledge-based system as a group addressing a suitable and agreed problem area. Description of the problem area, contained knowledge and suitability is worth 30%. General knowledge of the topic and overall coverage/effort 14%. Description, features, suitability to problem solving and pros and cons of the implementation vehicle (shell) is worth 26%. To show the level insights and clarity of understanding 30% is attributed to the quality, clarity, correctness and logic of the reported work.

**Assessment Timing:-**

Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

<table>
<thead>
<tr>
<th>Semester One</th>
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<th>WK7</th>
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<th>WK10</th>
<th>WK11</th>
<th>WK12</th>
<th>Exam Period</th>
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<tbody>
<tr>
<td></td>
<td>Problem area identification</td>
<td>Paper model approval</td>
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<td>Hand in Monday 12noon</td>
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</table>
Module Descriptor: Sustainable Engineering Postgraduate Programme

<table>
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<tr>
<th>Generic Module Title</th>
<th>Credit Value</th>
<th>Level</th>
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<tbody>
<tr>
<td>Risk Management (EF932)</td>
<td>10</td>
<td>5</td>
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</tbody>
</table>

**Timetable**

Semester 2, Weeks 1-12, Friday 1-3, M412

**General Aim**

Under Health and Safety legislation, and under the wider European Post-Seveso Directives, it is mandatory for many industries to carry out risk assessments with the aim of showing that risk is “As Low As Reasonably Practicable”. This module aims to introduce the fundamental techniques of risk analysis and risk-informed decision making. Students will have the opportunity to learn the general principles of methods and their place in risk management, as well as the chance to develop skills in applying these methods to variety of engineering examples.

**Syllabus**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Managing risks during lifetime of technological systems</td>
</tr>
<tr>
<td>2</td>
<td>Fault and event tree modelling</td>
</tr>
<tr>
<td>3</td>
<td>Using commercial software (e.g. Reliability Workbench) to support system risk analysis</td>
</tr>
<tr>
<td>4</td>
<td>Processes for identifying, assessing and managing common cause failures</td>
</tr>
<tr>
<td>5</td>
<td>Uncertainty and sensitivity analysis</td>
</tr>
<tr>
<td>6</td>
<td>Cost-benefit analysis to support ALARP assessments</td>
</tr>
<tr>
<td>7</td>
<td>Case studies - Industrial speaker</td>
</tr>
<tr>
<td>8</td>
<td>Role of the human in technological risk</td>
</tr>
<tr>
<td>9</td>
<td>Risk informed decision-making using Bayesian belief nets</td>
</tr>
<tr>
<td>10</td>
<td>Managing structured expert judgement to inform risk assessment</td>
</tr>
<tr>
<td>11</td>
<td>Case studies - Invited speaker</td>
</tr>
<tr>
<td>12</td>
<td>Risk Management processes and regulation</td>
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</table>

**Learning Outcomes**

- To understand the general process of risk management and its applications in industry
- To build risk models, appreciating the modelling issues involved in their application
- To understand key theoretical concepts and their application in the development of an ALARP case
- To use commercial software to conduct detailed risk analysis of technological systems

**Assessment Method(s)**

Class tests to assess understanding of key concepts and methods (50%) scheduled in weeks 6 and 12

Group assignment to develop full risk analysis of a technological system (50%)

**Coursework, case studies**

Major case studies (fully developed cases developed in collaboration with lead risk analysts in the partner organisations) include:

- NASA Space Shuttle Risk Assessment;
- RSSB UK Railway Network Risk Informed Investment Decisions
- Octel Chemical Plant Risk Modelling and Management

Invited speakers from industry (e.g. risk analysts or managers in relevant industries) and academics (e.g. international visitors to University).

**Recommended Reading**

- E-learning material customised for the module, originally developed with funding from EPSRC
- D. Vose "Risk Analysis"

**Lecturers**

<table>
<thead>
<tr>
<th>Lecturer</th>
<th>Ext no</th>
<th>Email</th>
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</thead>
<tbody>
<tr>
<td>Prof Lesley Walls</td>
<td>3616</td>
<td><a href="mailto:Lesley.walls@strath.ac.uk">Lesley.walls@strath.ac.uk</a></td>
</tr>
<tr>
<td>Dr Matthew Review</td>
<td>4578</td>
<td><a href="mailto:Matthew.j.revie@strath.ac.uk">Matthew.j.revie@strath.ac.uk</a></td>
</tr>
<tr>
<td>Professor Tim Bedford</td>
<td></td>
<td><a href="mailto:Tim.bedford@strath.ac.uk">Tim.bedford@strath.ac.uk</a></td>
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</table>
In Part B, teams of students will be formed, and each team will tackle a problem of practical relevance in close co-operation with industrial personnel. Each team will be required to make regular progress reports, culminating in the presentation of a final report to a panel of interested experts. Teams may be formed from within or across themes, however the latter option is favoured, as it provides students with an ideal opportunity to sample interdisciplinary project work. Please refer to your Pathway Director/Handbook for details of Group Projects available within your theme.

This component is valued at 40 PG credits.
EF936 Sustainable Engineering Group Project

Module Registrar: Directors of Distinct Pathways
Taught To (Course): Sustainable Engineering

Other Lecturers Involved: na
Credit Weighting: 40
Semester: 2

Assumed Prerequisites: na
Compulsory
Academic Level: 5

Module Format and Delivery (hours):

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tutorial</th>
<th>Laboratory</th>
<th>Project</th>
<th>Assignments</th>
<th>Private Study</th>
<th>Total</th>
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<tbody>
<tr>
<td>320</td>
<td>80</td>
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Educational Aim

The module extends across the various distinct pathways within the Faculty Postgraduate Programme in Sustainable Engineering. Students from different themes work collaboratively in teams to develop solutions for specific projects selected from an approved list addressing social, economic, or environmental aspects of sustainability, normally within an industrial or practice-based test bed, and/or in association with an appropriate design or industrial organisation. Field trips and regular progress reports are an important aspect of the project. Students present the outcomes of their group work at the annual student group project conference.

Learning Outcomes

On completion of the module the student is expected to be able to

LO1: demonstrate an ability to work across subject discipline boundaries in response to specific problem-solving tasks involving social, environmental, or economic aspects of sustainability

LO2: have an critical awareness of current design, production and management practices within industry

LO3: have an ability to apply analytical and modelling tools and techniques appropriately to specific design or industry-based problems

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Syllabus

The module will teach the following:

na

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

[Note: Criteria break the LO down into ‘teachable’ elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]

LO1
C1: Ability to contribute effectively to group work submission
C2: Ability to demonstrate an understanding and knowledge of social, environmental and economic sustainability in a group project written report and conference presentation
C3: Evidence of good structure, analysis and argument, and presentation skills in a written report and conference submission
LO2
C1: Demonstrate an awareness of current practices within industry in response to the specific project

LO3
C1: Demonstrate the application of appropriate tools and techniques in response to the specific project

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

12 Principles of Assessment and Feedback
(on Learning & Teaching web pages: www.strath.ac.uk/learnteach/teaching/staff/assessfeedback/12principles/)

Please state briefly how these are incorporated in this module.
- Examination by students of exemplars of previous project reports and conference presentations
- Students given choice of project topic from an approved list
- Natural peer dialogue in groups supported by discussion between staff and students of the assessment criteria and aims and objectives
- Delivery of high-quality feedback at the annual Sustainable Engineering Group Project Conference
- Conference presentation enhances student motivation and encourages positive self-esteem

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

<table>
<thead>
<tr>
<th>L/Outcomes</th>
<th>Examinations</th>
<th>Courseworks</th>
<th>Projects</th>
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<tr>
<td></td>
<td>Number</td>
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<td>Weighting</td>
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<td>LO1, 2 and 3</td>
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Indicate which learning outcomes (LO1, L02 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines:
Group Project Presentation (at the Sustainable Engineering Student Group Project Conference during week 12 of Semester 2)
Group Project Report (During Semester 2 Exam Period)

Resit Assessment Procedures:
Resubmission of Project Report

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of coursework.

Recommended Reading

TBA by Directors of Distinct Pathways (DDP)

Additional Student Feedback
(Please specify details of when additional feedback will be provided)

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Session: 2011/12

Approved:
| Course Director Signature: |
| Date of Last Modifications: |

(Updated November 2010)
# Module Timetable

**Module Code:** EF936  
**Module Title:** Sustainable Engineering Group Project

**Brief Description of Assessment:**  
Project Submission Part 1: Group Project Presentation  
Project Submission Part 2: Group Project Report

**Assessment Timing:**
Indicate on the table below the Start/Submission dates for each Assignment/Project and the timing of each Exam/Class Test(s).

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Exam Period:  
Part 1  
Part 2
Part C – Individual Project/Dissertation

In Part C students undertake supervised, individual project work, with the award of MSc being made on the basis of an acceptable report/dissertation submission. Students are encouraged to produce their dissertation in a style and format of their choosing including electronic submission (PDF Format). Notwithstanding this they should adhere to the guidelines shown below.

Students should check submission requirements with their Pathway Director as requirements may vary.

This component is valued at 60 PG credits.

FORMAT AND SUBMISSION OF DISSERTATIONS

Number of copies/Submission: Once permission to submit has been given by the student’s supervisor, two bound copies of dissertations should then be submitted to the Pathway Leader.

Materials specification: Materials used should be of high quality and conform, whenever possible, to the appropriate British or International Standard.

Paper Specification: Both copies should be on good quality A4 sized paper (210 mm x 297 mm).

Method of production: The text (including the summary) should be in printed form and of such a quality as will ensure a high standard of reproduction. All other material submitted (e.g. computer print-outs, diagrams and maps) should be of the same quality.

Abstract: The dissertation should include an Abstract of the contents, not exceeding three hundred words in length, which should be bound in at the beginning of the general text.

Title page: The dissertation should contain a title page or equivalent designator giving the name of the University Department, the title of the dissertation, the name of the author, the degree and the year of submission of the dissertation. Each separate component of the dissertation should contain such a title page or equivalent designator.

Declaration of author’s rights: The dissertation should include, on the page immediately subsequent to the title page, the following declaration of author’s rights:

‘The copyright of this dissertation belongs to the author under the terms of the United Kingdom Copyright Acts as qualified by University of Strathclyde Regulation 3.49. Due acknowledgement must always be made of the use of any material contained in, or derived from, this dissertation.’

Layout: The text should appear on the recto side of the page only, lines double or one-and-a-half spaced. There should be a margin (before trimming) of 40 mm at the left-hand (binding) edge, 25 mm at the fore edge, of 20 mm at the head of the page and of 40 mm at the tail. Illustrations, diagrams, tables, etc, may appear on either side of the page, whether or not the other side is blank, provided that legibility is not impaired. The margin should conform as far as possible to that specified above for text pages; in any event, there must be an adequate binding edge margin.

Pagination: Text pages should be numbered in continuous sequence. Preliminary material (e.g. contents pages and abstract) and appendices may be given separate pagination. Pages on the verso side, if they bear authorised material, should be numbered according to the facing page with the affix A.

Covers and binding: The covers should be board covered in black buckram. Both copies should be sewn, preferably on tapes.

Lettering: The lettering on all copies should be in gold. On the front board should appear the title, in 24-point capitals, and the author’s name, in 18-point capitals. On the spine should appear in 14-point capitals the author’s surname, followed by the author’s initials, the degree for which the dissertation was submitted, and the year of submission. 14-point lower case letters should be used in the name of the degree, as appropriate. The direction of the lettering should run from the base of the spine.
Useful Information

The University has many policies administered by various departments around the institution covering Health and Safety, Administrative and Personnel issues.

Information on these:

- Complaints and IT Systems
- Academic Matters
- Money Matters
- Etc

Can be found on the Student Homepage on the University’s website at http://www.strath.ac.uk/student.

Equality and Diversity

The University of Strathclyde is committed to achieving and promoting equality of opportunity in the learning, teaching, research and working environments.

We value the diversity of our students and support the development of mutual respect and positive relations between people.

The University has in place an Equality Policy, Disability Policy and Equality Outcomes which meet the requirements the Equality Act 2010.

You are advised to familiarise yourself with the University approach to equality and diversity and relevant developments and information by visiting the website: www.strath.ac.uk/equalitydiversity/equalityinformationforstudents/

It is important that you understand your rights and responsibilities. Any discriminatory practice, including cyber bullying, on your part may lead to the University initiating disciplinary action.

If you have any queries please bring these to the attention of staff or the University's Equality and Diversity office.

Email: equalopportunities@strath.ac.uk
Telephone: 0141 548 2811
www.strath.ac.uk/equalitydiversity/

Athena SWAN

The University currently holds a Bronze Athena SWAN award, recognising our commitment to advancing women's careers in science, technology, engineering, maths and medicine (STEMM) employment in academia.

The Athena SWAN Charter has been developed by the Equality Challenge Unit to encourage and recognise commitment to combating the under-representation of women in STEMM research and academia.

If you would like any additional information, please contact the Equality and Diversity office.
**Students with disabilities**

The University is committed to providing an inclusive learning and working environment for disabled people.

If you have, or think you have, a disability we encourage you to disclose it as soon as possible. Declaring your disability will enable you to access any additional support that you may need and help to ensure you become a successful student. The information you provide will be treated as confidential and will not be shared with other staff without your consent.

The University has a dedicated Disability Service that offers specific advice, information and assistance to disabled students, including information on the Disabled Students Allowance (DSA). Further information is available from the website:  [www.strath.ac.uk/disabilityservice/](http://www.strath.ac.uk/disabilityservice/)

In addition, each academic Department/ School (for HaSS) has at least one Departmental Disability Contact (DDC), who act as a first point of contact for disabled students. The Departmental Disability Contact list is available on the website at:  [www.strath.ac.uk/disabilityservice/ddc/](http://www.strath.ac.uk/disabilityservice/ddc/)

Please inform your course tutor, the DDC and a member of the Disability Service of your needs as soon as possible. The Disability Service will then formally communicate your needs to your Department/ School.

Email:  [disabilityservice@strath.ac.uk](mailto:disabilityservice@strath.ac.uk)
Telephone:  0141 548 3402
[www.strath.ac.uk/disabilityservice](http://www.strath.ac.uk/disabilityservice)

**Issues with Physical Access on campus**

If you experience an issue with physical access anywhere on campus, please email:  [physicalaccess@strath.ac.uk](mailto:physicalaccess@strath.ac.uk) where a member of Estates staff will be able to help.

**Classroom Protocol**

At the University we are committed to providing a safe learning environment where dignity is respected and discrimination or harassment, including cyber bullying does not occur on the basis of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation and socio-economic background. No student should intentionally be made to feel threatened or excluded from class participation.

You are reminded of your responsibility to show respect to fellow classmates and staff by remembering the following protocol for the duration of your studies:

- Attend all scheduled lectures/ seminars and/ or practical sessions such as labs, including any additional learning and teaching sessions.
- Arrive on time and remain in class until the end of the session. If you need to leave early for any reason, please notify the tutor at the beginning or prior to the class.
- Do not disrupt the class by habitually coming in late or coming and going from the classroom during the session. Students arriving late, without justified reasons, may be refused entry.
- Refrain from consistently interrupting another speaker and listen to the ideas of others with respect. Do not be rude or make personal attacks on individuals during group discussions.
- Inform and establish consent of the tutor if you wish to record the lecture. The recording must be used only for personal study.
- Do not bring food into the classroom, other than for medical reasons, e.g. diabetes. Beverages may be permissible at the tutor’s discretion if the room utilisation rules allow.

- Inform tutors of specific requirements for example the need to perform prayers for practising students of diverse faiths.

- Seek consent of students and staff before taking any photos, audio or visual recordings in the classroom. These must not be shared on any social network sites without permission.

- At any course related external visit you are acting as ambassadors of the University and are reminded to act as such.

- Refrain from smoking on premises as this is prohibited in all University buildings.

- Follow emergency instructions and health and safety procedures.

- Should you have any concerns please bring them to the attention of your tutor and/ or appropriate University staff.