

Major Change to Existing Programme Review

Date of Review: 10 June 2013

Named Award:	Honours Bachelor Degree in Engineering
Programme Title:	Sustainable Energy
Award Type:	Honours Bachelor Degree
Award Class:	Major
NFQ Level:	8
Intakes Commencing:	September 2013
ECTS/ACCS Credits:	240 credits

Preamble

The Module & Programme Change Process (adopted AC 24/2/2010) outlines the procedure for reviewing and approving a major change to a programme other than through the normal Programmatic Review process.

Once submitted the proposal to change a programme will be reviewed by the Head of Academic Quality. She/he will then decide on one of the following review processes:

- 1. Review the proposal and after consulting with the proposers and the relevant Programme and Module Coordinators will decide to approve or reject new version of the Programme.*
- 2. Conduct an internal review of the proposed change which will involve an internal panel of reviewers. After consulting with the proposers and the relevant Programme and Module Coordinators the review panel will decide to approve or reject the new version of the programme.*
- 3. Conduct an external review of the proposed change which will involve consultation with external reviewers. Normally this type of review will also involve an internal review panel. Following consultation with the proposers, the relevant Programme and Module coordinators and the external experts the panel of internal reviewers will decide to approve or reject the new version of the programme.*

Following feedback from a number of sources, the Department of Process, Energy & Transport Engineering wished to propose a number of changes to the Bachelor of Engineering (Honours) in Sustainable Energy (CR510). Due to the delay in the Engineering Programmatic Review, the Department requested that the Registrar's Office process this proposal via the major change to Programme procedure.

All proposed new modules and revised modules have been reviewed by appropriate external reviewers and have undergone an internal module moderation process. The Dean of Academic Quality Enhancement decided to adopt the first review process above.

Proposal Summary

1. Approval for one year to run transition schedules shown in **Transitional (interim) schedule from September 2013 (programme ID 1224)** for the academic year 2013-2014 with a view to having the revised programme shown in **Sept 14_Bachelor of Engineering (Honours) in Sustainable Energy(Programme ID1292)** be approved at the upcoming programmatic review to run in 2014-2015. The summary of the changes is given in Table 1.
2. Approval for the new modules listed in Table 2 which also includes their associated external reviewers.
3. Approval to include the approved modules listed in Table 3 in the revised programme schedules.
4. Approval for the eight amended modules, including module re-titling where appropriate, as listed in Table 4.
5. Approval for a change in title from

Bachelor of Engineering (Honours) in Sustainable Energy
to **Bachelor of Engineering (Honours) in Sustainable Energy Engineering**

Background

The B.Eng. (Hons) in Sustainable Energy has been running since September 2008 and has had a total of circa 100 graduates over this time. Approximately fifty have completed the ab-initio programme with the remainder transferring into the final years of the degree having completed cognate Engineering Level 7 Ordinary Degrees.

It was a stated recommendation of the original programme review panel that the course be periodically reviewed to ensure the relevance was maintained and that feedback from graduate employment opportunities could be considered. This is especially important of a sector that is new to Ireland as an engineering discipline, and that is evolving very rapidly as the move to non-fossil fuel energy sources and new energy efficiency technologies gathers apace.

Programme design and delivery

The course board has conducted lengthy evaluation of the current course content, delivery and methods of assessment in order to develop the programmatic review proposals. In addition, consultations have taken place with industry, external examiners, members of the Professional Accrediting Institute (Energy Institute) and Faculty Staff.

The Course has been accredited by the Energy Institute since the initial course approval, and feedback from this process has informed the proposed changes. Notably the need for a systems approach to energy, the importance of team working and multi-disciplinary engagement, and the need to develop the course as required once the career opportunities for the graduates became clearer.

The proposals outlined in this document have been developed to try and ensure minimal disruption to the on-going delivery of the course, and it is hoped that in most cases a “step change” in the programme can be accomplished in a single year. There are a few instances where this may not be immediately possible and a case is made for these exceptions.

The general thematic content and subject strands within the programme have been largely unaffected, rather the changes have been made to fine-tune the content and delivery of material, removing excessive overlap and duplication, and adjusting some content to reflect the reality and needs of the emergent jobs market for the graduates.

One notable additional element is the introduction of more extensive team based and multi-disciplinary, problem solving work in the Product Design Module in Stage 3. This module is entirely team based, and requires the students to develop skills in team working, management, ideas generation and technical innovation as well as embracing commercial, marketing and business concepts. The opportunity will be made available for these students to work directly with others from other engineering disciplines as well as with students from the Accounting and Marketing Programmes. All groups will be required to submit an entry to the CIT Innovation Competition.

The programming elements of the degree have been extensively reviewed to provide more cohesive and incremental learning to be achieved as the students progress from entry level skills of manipulating spreadsheet data in year 1 to developing their own models for energy systems in the final year.

The electrical and electronic content of the programme has been revised to provide a more complete coverage of the appropriate course material, level of competency and understanding. In particular, a new focus has been developed on the integration of sensors, control elements and theoretical concepts and a systems level analysis of energy systems. This group of modules will benefit greatly from the development of the CIT National Sustainable Building Energy Testbed (NSBET) which is nearing completion in the Nimbus Building. Indeed some of the module content will be delivered by Nimbus staff directly involved with this cutting edge technology.

Summary of Changes

The following are the changes to the modules included in the programme:-

Seq	2012-2013		Final Schedule 2013-2014		Interim Schedule 2014-2015	
	Current Semester	Current Module	Proposed Semester	Proposed Module	Proposed Semester	Proposed Module
1	2	PHYS6007 Instrument Calibration	2	Microcontroller Applications	2	Microcontroller Applications
2	2	COMP6014 ICT for Eng Techs	3	SOFT6005 Programming Fundamentals I	3	SOFT6005 Programming Fundamentals I
3	3	MECH6022 Mech CAD and Design 2.1	2	CHEM6001 Engineering Chemistry	2	CHEM6001 Engineering Chemistry
4	4	MECH6021 3-D Mech Analysis	5	CHEP8013 Product Design	5	BULD7002 Building Energy Rating
5	5	MANU7003 Engineering Management*	6	Operations & Project Management*	7	INTR8009 Eng Project Management*
6	7	INTR8009 Eng Project Management*	7	Process Thermal Energy Network	7	Process Thermal Energy Network
7	1	MANU6003 BS Electrotech 1	1	Electrical Principles 1	1	Electrical Principles 1
8	3	MANU6004 BS Electrotech 2	3	Electrical Principles 2	3	Electrical Principles 2
9	5	ELEC7007 Electrotech for Mech L7	6	Power Electronics	6	Power Electronics
10	8	MECH8022 Energy Power Systems	7	Renewable Energy in Power Systems	7	Renewable Energy in Power Systems
11	4	ENVE6001 Wind Energy	4	Wind Energy Systems 1	4	Wind Energy Systems 1
12	8	MECH8014 Mechatronics Systems Design	8	INTR8010 Sensor Technology	8	INTR8010 Sensor Technology
13	7	MATH8005 Maths for Control & Quality	5	CHEP7004 Control and Instrumentation	5	CHEP7004 Control and Instrumentation
14	8	MECH8003 Energy Systems Control	8	CHEP8004 Automatic Process Control	8	MECH 8003 Energy Systems Control

Table 1: Summary of differences between the current schedule and the proposed transitional (Interim Schedule) and final schedules (September 2014)

Seq	Sem	Proposed Module	External reviewer Academic /Industrial
1	2	Microcontroller Applications	Dr Philip Owende (Senior Lecturer -ITB) Dr. Sean Condon, Director, ServusNet Informatics Ltd.
2	7	Process Thermal Energy Network	Prof. Richard Carbury Mr Xavier Dubuisson
3	1	Electrical Principles 1	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)
4	3	Electrical Principles 2	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)
5	6	Power Electronics	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)
6	7	Renewable Energy in Power Systems	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)
7	4	Wind Energy Systems 1	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)
8	7	Operations & Project Management	Prof. Neil Hewitt (Uni. Of Ulster), Ger O'Farrell (LIT)

Table 2: Proposed new modules with the associated external reviewers listed.

Seq	Proposed Semester	Proposed Module
1	3	SOFT6005 Programming Fundamentals I
2	2	CHEM6001 Engineering Chemistry
3	5	CHEP8013 Product Design
4	8	INTR8010 Sensor Technology
5	5	CHEP7004 Control and Instrumentation
6	8	CHEP8004 Automatic Process Control

Table 3: Existing modules to be included in the proposed programme.

Seq	Current Semester	Current Module	Proposed Semester	Renamed Module
1	1	INTR6006 Climate Change, Energy and Sustainability	1	INTR6006 Climate Change and Energy
2	1	INTR6012 Sustainable Energy	1	Energy Sources and Conversion
3	3	INTR6011 Sustainable Development	3	INTR6011 Sustainable Development
4	4	INTR6010 Sustainability and Transport	4	INTR6010 Sustainability and Transport
5	6	INTR7008 Solar and Geothermal Energy	7	INTR7008 Solar Energy
6	7	INTR8018 Energy Systems Modelling	7	INTR8018 Energy Systems Modelling
7	6	ELEC7008 Energy and the Environment	5	ELEC7008 Energy and the Environment
8	8	INTR8017 Sustainability Engineering	8	INTR8017 Sustainability Engineering

Table 4 Existing Modules that have been amended as part of this review process

Findings

Module Level

1. The new modules have undergone external and internal review and are recommended for approval.
2. The amendments to existing modules have been reviewed and are recommended for approval.

Programme Level

1. The changes proposed arise from an extensive consultation process involving a range of stakeholders including graduates, employers and professional bodies. The proposed transition schedule is recommended for approval for the upcoming academic year 2013-2014 for a period of one year.
2. The change in programme title is recommended for approval.