PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	Graduate Diploma
4	**Programme Title**	Graduate Diploma in Chemical Process Engineering
5	**UCAS/Programme Code**	3317F
6	**Programme Accreditation**	IChemE, Energy Institute
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	6
9	**Date written/revised**	25/4/2008

10 Programme Aims

This programme is a conversion course designed for students with a good first degree in an engineering related science subject. It aims to provide them with training in chemical engineering to complement their scientific knowledge and allow them to apply for jobs within the chemical / materials processing industries.

The aim of the programme is to produce graduates who have a coherent understanding of chemical engineering, combining a sound theoretical grasp of the subject with practical experience and an awareness of the responsibilities of a chemical engineer to society and the environment

1. To recruit good students from a range of engineering related science backgrounds.
2. To equip students with a knowledge and understanding of the subject, including the core material specified by the accrediting professional institutions (The Institution of Chemical Engineers and the Energy Institute)
3. To enable students to eventually meet the requirements of the accrediting Institutions for Incorporated Membership
4. To equip students with appropriate practical skills in information processing, data analysis, problem solving, teamwork, and communication skills.
5. To encourage students to develop responsible attitudes towards the needs of society and the environment in the application of their engineering and economic knowledge and to ensure that they have particular regard for the importance of safety in their industrial life.
6. To encourage students to develop appropriate attitudes towards their own future professional development.
7. To provide an environment within the School such that students enjoy the University learning experience sufficiently to want to maintain contact with the School in its future recruiting, teaching, research and social activities.

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for Engineering

Knowledge and Understanding

On completing the programme students should:

A1 Knowledge and understanding of the essential facts, concepts, principles and theories of C&P Engineering.

A2 The role of chemical engineers in society and the constraints within which their

engineering judgement will be exercised, including the professional and ethical responsibilities of chemical engineers.

A3 The environmental and safety issues that affect C&P engineering and the issues associated with sustainable engineering solutions.

A4 Conceptual, elemental and detailed design of processes and process plant.

A5 Safe operation of processes and plant,

A6 Codes of practice, design, the assessment of safety and environmental risks, and the legislative framework for safety.

Teaching and Learning Methods

Knowledge and understanding is primarily imparted through a combination of lectures, tutorials, example classes, case studies, coursework and projects. In some cases the formal lectures are supplemented by computer assisted learning (CAL). A number of visiting lecturers and professors who work in the chemical industry contribute to A5, A6. Teaching is enhanced by the provision of challenging open-ended tasks.

Throughout the course, learners are encouraged to undertake independent reading to deepen, supplement and consolidate what is being taught/learnt and to broaden their individual knowledge and understanding of the subject. Students are given guidance and directed to engineering literature related to their design project. Feedback on essays and project reports allows students to refine their presentation techniques in these areas, and to assess the level of their knowledge and understanding.

Assessment Strategy

Testing the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of coursework reports, project reports and presentations. The proportion of in-course and written examination towards the final module assessment is usually 25 / 75 although this can vary as appropriate for the module and level of study. The External Examiner may also examine some students through oral examination.

Intellectual Skills

On completing the programme students should be able to:

B1 Select and apply appropriate scientific principles, mathematical methods and computer based methods for modelling and analysing engineering problems

B2 Critically analyse computational results and determine their strength and validity.

B3 Use the scientific literature effectively and to search for information to develop concepts.

B4 Produce a conceptual or elemental design to a specification.

B5 Produce a full design specification for a process or process plant.

B6 Identify the required cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact of the application of the design.

B7 Determine the criteria for evaluating the design solution and evaluate the outcome of the design against the original specification.

Teaching and Learning Methods

Subject-specific/professional skills are developed through project work (B2) and design exercises (B3-B8). Lectures, tutorials, case studies and seminars of specific modules develop skills B3 (Process Design), B4-B6, B7 and B8 (Plant Design). Students are required after appropriate guidance, to search the literature for information and submit all written work in an appropriate scientific/engineering format so that B1-B3 are thoroughly integrated into all submitted work.

All written work must be submitted in an appropriate scientific and engineering format and feedback on such work enhances learning of the skills B3-B8 culminating in the plant design

project. The design project is carried out in small groups (4-6 students) monitored by an academic supervisor.

Assessment Strategy

Practical skills are assessed through coursework and project reports, presentations, group oral discussions, and unseen written examinations. Skills B2-B8 form a major part of the assessment of the plant design project.

Practical Skills

On completing the programme students should be able to:

C1 Analyse and solve engineering problems.

C2 Design a process or process plant to meet a business or environmental need.

C3 Be creative in the solution of problems and in the development of designs.

C4 Evaluate designs and make improvements.

C5 Make engineering sketches and use computational tools and packages.

Teaching and Learning Methods

Practical skills are developed through the teaching and learning programme outlined above. Analysis and problem solving skills are developed through example classes, tutorials, coursework, and project work. Design skills are further developed through coursework activities and the design project. Individual feedback is given to students on all work produced.

Students are encouraged, following appropriate guidance, to plan and carry out their own investigative work and to analyse data in critical manner. Feedback provided on all submitted work provides opportunities for students to improve their intellectual skills. In particular, the design project provides the opportunity to develop skills C1-C4.

Assessment Strategy

Analysis and problem solving skills are assessed through unseen written examinations and coursework. Design skills are assessed through coursework reports, project reports, presentations and unseen written examinations. Creative and design skills are assessed through the design project reports and the design project presentation.

Transferable/Key Skills

On completing the programme students should be able to:

D1 Prepare technical reports, specifications and give technical presentations.

D2 Apply mathematical skills through modelling and analysis

D3 Work as a member of an interdisciplinary team.

D4 Develop ideas and solutions to engineering problems.

D5 Use information and communications technology.

D6 Manage resources and time, plan, organise and prioritise work effectively to meet deadlines.

D7 Learn independently in familiar and unfamiliar situations with open-mindedness and in the spirit of critical enquiry.

D8 Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

Teaching and Learning Methods

Transferable skills are developed through the teaching and learning programme outlined

above (and in section 11). Communication skills D1 are acquired through individual and team work throughout the design project, and developed through feedback on written reports and presentations made as part of the design project.

Transferable skills are applied in many subject-specific modules with students required to find information and give oral and/or written presentations throughout all years of study. Deadlines for submission of coursework are strictly enforced encouraging students to develop D5 and this is supported by guidance provided during Induction week. Design problems provide opportunity to develop skills D2-D7.

Assessment Strategy

Transferable and communication skills are assessed through coursework reports, presentations and oral examinations in a number of compulsory and optional modules.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The courses studied have been selected to introduce and develop students knowledge of the main subject areas within chemical engineering. The key chemical engineering subjects are covered in the course namely:

- Energy and Material Balances
- Fluid Flow
- Heat and Mass Transfer
- Reactor Engineering
- Process Safety
- Process Control

Chemical engineering design is introduced and practiced in the Design project. The emphasis of the course is on the ability to produce a design. The plant design project provides a central theme and the successful completion of the plant design is the main criterion used by the Institute of Chemical Engineers when deciding whether to allow graduates from this course to become Incorporated Engineers

Key features of the programme (including what makes the programme distinctive)

The duration of the course is one academic years of 31 weeks, arranged in three terms and currently divided into two Semesters and including an Induction week at the beginning of Semester 1.

Each student studies 120 credits during the course. These credits are compulsory.

The majority of the subjects studied are 10 credit modules, with the exception of the design project that is 40 credits. The design project is broken down into milestones to enable management of student progress during the project.

To gain a Graduate certificate in Chemical Engineering, the students must pass the year with an average of 40% or greater.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/regulations/programme/2009-2010/documents/3317GradDiplomaGW010409.pdf

13 Criteria for admission

Entry qualifications

The entry requirement is for a 2:2 degree in one of the following science subject areas

Chemistry
Materials Science
Physics

Biology
Biochemistry
Environmental Science

In addition prospective overseas students must provide evidence that they have a minimum entry standard of IELTS 6.5 (or equivalent)

Engineering requires a wide range of attributes and abilities, so selection is not solely based on academic grades. Selectors seek evidence of motivation and commitment form the Personal Statement and Reference on application forms.

Admissions policy/selection tools
Applicants meeting the entry qualifications and if appropriate the English language capability are automatically accepted via the E2R system. Applicants with non-standard qualifications are passed to the DPD for consideration on a case by case basis. Candidates based in the UK are invited for a visit, however for most overseas applicants a

Non-standard Entry Requirements
Students possessing an ordinary degree in Chemical Engineering from a recognised overseas institution may be considered for admission to the course after a review of the subjects they have studied and their references has been carried out by the DPD.

Additional Requirements

Level of English Language capability
Overseas applicant must provide evidence that they have a minimum entry standard of IELTS 6.5 (or equivalent)

14 Support for Student Learning

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid.

Help with academic writing is available from the Writing Centre.

Academic support
The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support
All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. In addition the University offers a range of support services, including one-to-one counselling and guidance or group sessions/workshops on a range of topics, such as emotional issues eg. Stress and anxiety,

student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Union Society operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

Support for students with disabilities
The University's Disability Support Service provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities. Access to specialist chemical engineering design software is provided by the design suite in Merz Court.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-sessional language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

15 Methods for evaluating and improving the quality and standards of teaching and learning

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the School Teaching and Learning Committee and at the Board of Studies. Student opinion is sought at the Staff-Student Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Teaching and Learning Committee. External Examiner reports are shared with institutional student representatives, through the Staff-Student Committee.

Student evaluations
All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking the students' views on the quality of the learning and teaching in their HEIs. With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback
Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms
The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a

review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching and Learning Committee on whether the programmes reviewed should be re-approved for a further five year period.

Accreditation reports

Additional mechanisms
All staff are subject to periodic peer observation of their teaching. Any issues arising are dealt with by the School Teaching and Learning Committee

16 Regulation of assessment

Pass mark
The pass mark is 40 (Undergraduate programmes)

Course requirements
Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35 is possible at each Stage and there are resit opportunities, with certain restrictions.

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions. For the Graduate Certificate in Chemical Engineering:

<40	Fail
40 or above	Pass

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus (see http://www.ncl.ac.uk/postgraduate/

The School Brochure (contact carol.mee@ncl.ac.uk)

The University Regulations (see http://www.ncl.ac.uk/calendar/university.regs/)

The Degree Programme Handbook

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Annex

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Intended Learning Outcome	Module codes (Compulsory in Bold)
A1	**CME1005, CME2001, CME2015, CME2016, CME2018, CME3024, CME3025**
A2	CME3009, CME3025
A3	CME3009, CME3025
A4	CME3009
A5	CME3025
A6	CME3009, CME3025
B1	**CME1005, CME2001, CME2015, CME2016, CME2018, CME3024**
B2	CME3009
B3	CME3009, **CME3024, CME3025**
B4	CME3009
B5	CME3009
B6	CME3009
B7	CME3009
C1	**CME1005, CME2001, CME2015, CME2016, CME2018, CME3009, CME3024, CME3025**
C2	CME3009
C3	CME2001, CME2015, CME3009, CME3025
C4	CME3009
C5	CME2001, CME2015, CME 3009, CME3025
D1	CME3009
D2	CME2001, CME 2016, CME2018, CME3009, CME3025
D3	CME2015, CME3009
D4	**CME1005, CME2001, CME2015, CME2016, CME2018, CME3009, CME3024, CME3025**
D5	CME3009, CME3024
D6	**CME1005, CME2001, CME2015, CME2016, CME2018, CME3009, CME3024, CME3025**
D7	CME3009
D8	CME3009