## Computer Science (Human Computer Interaction) MEng (Hons) 2016-2017

### Summary

<table>
<thead>
<tr>
<th>UCAS code</th>
<th>Award</th>
<th>Title</th>
<th>Duration</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>I142</td>
<td>MEng</td>
<td>Computer Science (Human Computer Interaction) MEng (Hons)</td>
<td>4 years</td>
<td>FT</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Schools</th>
<th>Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Engineering and Physical Sciences</td>
</tr>
<tr>
<td>Awarding Institution</td>
<td>University of Manchester</td>
</tr>
<tr>
<td>Programme Accreditation</td>
<td></td>
</tr>
<tr>
<td>Relevant QAA benchmark(s)</td>
<td>Computing</td>
</tr>
</tbody>
</table>
Aims and intended learning outcomes

Our programmes aim to:

1) enable graduates to exhibit a high level of practical and theoretical skills over a broad range of Computer Science together with a knowledge of currently available techniques and technologies in Human Computer Interaction.

2) explore the principles that support developments in a rapidly changing subject.

3) provide opportunities for students to understand the wide range of research challenges facing Computer Science and Human Computer Interaction, as well as the breadth and depth of research undertaken in this top-rated school, so they are prepared to embark on research here or elsewhere.

4) develop competent professionals able to play a leading part in many different commercial, industrial and academic activities and adapt rapidly to changing technology.

5) meet industry demand for high calibre graduates who will take a lead in continuing technological change.

6) prepare students for the social, organisational and professional context in which they will be working.

7) In addition, the with Industrial Experience programmes aim to: give extensive practical experience of an industrial or business environment where students are able to apply and develop their skills, both technical and personal.

8) In addition, the MEng programmes aim to: prepare high fliers for professional practice in Computer Science by enhanced depth and breadth of study together with increased emphasis on industrial relevance through industrially related group projects.

Intended learning outcomes (UG)

Knowledge & understanding

A1 ⬠ Know and understand the essential mathematics relevant to computer science.

A2 ⬠ Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface techniques

A3 ⬠ Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication

A4 ⬠ Recognise and appreciate the professional and ethical responsibilities of the practising computer professional, including understanding the need for quality

A5 ⬠ Know and understand the principles and techniques of a number of application areas informed by the research directions of the subject, such as artificial intelligence, databases and computer graphics

A6 ⬠ Apply their knowledge of computing in a commercial or industrial context

A7 ⬠ Show a critical understanding of the broad context within which Computer Science resides, including issues such as quality, reliability, enterprise, employment law, accounting and health and safety

A8 ⬠ Have a comprehensive knowledge and critical awareness of selected specialist fields at the forefront of computer science, studied at masters level

Intellectual (thinking) skills

B1 ⬠ Solve a wide range of problems related to the analysis, design and construction of computer systems.

B2 ⬠ Design and implement a software or hardware system of significant size

B3 ⬠ Identify a range of solutions and critically evaluate and justify proposed design solutions

B4 ⬠ Solve computer science problems with pressing commercial or industrial constraints

B5 ⬠ Generate an innovative design to solve a problem containing a range of commercial and industrial constraints
Practical skills

C1 (UG) Plan and undertake a major individual project
C2 (UG) Prepare and deliver coherent and structured verbal and written technical reports
C3 (UG) Give technical presentations suitable for the time, place and audience
C4 (UG) Use the scientific literature effectively and make discriminating use of Web resources
C5 (UG) Design, write and debug computer programs in appropriate languages
C6 (UG) Use appropriate computer-based design support tools
C7 (UG) Apply computer science skills in a commercial or industrial environment
C8 (UG) Demonstrate initiative taking, innovation and self-management in an industrially related group project
C9 (UG) Integrate previously acquired skills and apply them to new, demanding situations

Transferable skills

D1 (UG) Display an integrated approach to the deployment of communication skills
D2 (UG) Use IT skills and display mature computer literacy
D3 (UG) Work effectively with and for others
D4 (UG) Strike the balance between self-reliance and seeking help when necessary in new situations
D5 (UG) Display personal responsibility by working to multiple deadlines in complex activities
D6 (UG) Employ discrete and continuous mathematical skills as appropriate
D7 (UG) Demonstrate significantly enhanced group working abilities
D8 (UG) Further develop career plans and personal objectives
D9 (UG) Communicate effectively with non-specialist as well as computer scientist professionals at a range of levels
D10 (UG) Undertake a range of technical roles within a team and be able to display leadership

Intended learning outcomes (PG)

Knowledge and Understanding

A1 (At all levels) Acquire a knowledge of a range of advanced topics in Computer Science beyond undergraduate level and at the forefront of research
A2 (At all levels) Understand, apply and develop leading-edge technologies in two of the following themes: Advanced Web Technologies, Computational Biology, Concurrency, Data Management, Health Informatics, Learning from Data, Logic and Automated Reasoning, Management, Mobile Computing, Text Mining, Security, Software Engineering, Visual Computing
A3 (MSc & PG Diploma) Have a knowledge & understanding of research methodology & practice

Intellectual Skills

B1 (MSc and PG Diploma levels only) Develop and evaluate original ideas in a research context
B2 (All) Use methodologies for development of computational systems at an advanced level
B3 (All) Perform problem-solving in academic and industrial environments
Practical Skills
C1  Develop applications to satisfy given requirements
C2  Organise & pursue a scientific or industrial research project (MSc and PG Diploma only)
C3  Use, manipulate and develop large computational systems
C4  Perform independent information acquisition and management

Transferable Skills and Personal Qualities
D1  Work and communicate effectively as a team member
D2  Prepare and present seminars to a professional standard (MSc level only)
D3  Understand ethical issues related to professional activities
D4  Write theses and reports to a professional standard (MSc and PG Diploma)
D5  Perform independent and efficient time-management

Generic reference to outcome group
G1  Knowledge and Understanding
G2  Intellectual Skills
G3  Practical Skills
G4  Transferable Skills and Personal Qualities
G5  Not specified
Teaching, learning and assessment methods

Learning and Teaching on all our programmes aims to combine an understanding of fundamental CS and HCI principles, development of strong practical skills and the group-working, learning and communication skills that are essential for any computing professional.

Course units which involve practical elements all have associated laboratory exercises, usually in timetabled sessions with staff and demonstrator support. Most labs operate a system of face-to-face marking in the lab so that students receive immediate feedback on their work. Units without labs all have regular coursework exercises to support skills development and feedback.

Most units are lecture based, with lab or coursework exercises used to reinforce and enhance knowledge and skills first encountered in lectures. The first year team project deviates significantly from this model and takes an Enquiry Based Learning approach. This unit aims to encourage students to be more actively engaged with, and responsible for, their own learning, to develop skills in problem solving, communication, independent learning, and group work, and to signal the importance we attach to independent learning. This approach is followed up in the second year with the workshop based approach used in the compulsory Software Engineering unit, which also contains a major group working component.

The choice of units offered to students on our programmes is very broad, but they also require depth in study into Human Computer Interaction. The first and second years are reasonably core and include units from Life Sciences, Psychology, and Social Science (specifically Social Statistics). The final years allows more choice. It is intended that by the end of the BSc the students will have been given a deep education in HCI and that if the student chooses to take the MEng year, they will be introduced to a number of specialist domains, or be able to pursue aspects already introduced to a higher level.

All students undertake an individual 3rd year project, supervised by a member of academic task, which usually involves the development of significant software or hardware product. Assessment of this unit involves presentations of plans and results and a major written report.

Assessment in almost all units is a combination of lab/coursework and examination.

Learning, Teaching and Assessment of intended learning outcomes

Knowledge and Understanding

<table>
<thead>
<tr>
<th>Learning and Teaching Processes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (A1, A2, A3, A4, A5, A6, A7)</td>
<td>Unseen written examinations (A1, A2, A3, A4)</td>
</tr>
<tr>
<td>Laboratory sessions (A2, A3)</td>
<td>Marked tutorial exercises (A1, A2, A3, A4)</td>
</tr>
<tr>
<td>Personal tutorials (A1, A2, A3, A4, A7)</td>
<td>Laboratory reports (A2, A3)</td>
</tr>
<tr>
<td>Problem solving classes (A1, A2, A3, A4)</td>
<td>Project reports (individual and group) (A3, A4, A5, A6, A7)</td>
</tr>
<tr>
<td>Problem-based learning (A2, A3, A4, A5, A6, A7)</td>
<td>Oral presentations (individual and group) (A3, A4, A5, A6, A7)</td>
</tr>
<tr>
<td>Projects (A3, A4, A5, A6, A7)</td>
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</tr>
<tr>
<td>Industrial seminars (A4, A5, A6, A7)</td>
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Intellectual Skills

<table>
<thead>
<tr>
<th>Learning and Teaching Processes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (B1, B2, B4, B5)</td>
<td>Unseen written examinations (B1, B2, B4)</td>
</tr>
<tr>
<td>Laboratory sessions (B1, B2)</td>
<td>Marked tutorial exercises (B1, B2)</td>
</tr>
<tr>
<td>Personal tutorials (B1, B2, B4)</td>
<td>Laboratory reports (B1, B2)</td>
</tr>
<tr>
<td>Problem solving classes (B1, B2, B4)</td>
<td>Project reports (individual and group) (B1, B2, B3, B4, B5)</td>
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<tr>
<td>Problem-based learning (B1, B2, B4)</td>
<td>Oral presentations (individual and group) (B1, B2, B3, B4, B5)</td>
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<tr>
<td>Projects (B1, B2, B3, B4, B5)</td>
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Practical Skills

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<thead>
<tr>
<th>Learning and Teaching Processes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (C4, C6)</td>
<td>Laboratory reports (C1, C2, C3, C4, C5, C6, C7)</td>
</tr>
<tr>
<td>Laboratory sessions (C1, C2, C3, C4, C5, C6, C7)</td>
<td>Project reports (individual and group) (C3, C4, C5, C6)</td>
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<tr>
<td>Projects (C3, C4, C5, C6, C9)</td>
<td>Oral presentations (individual and group) (C6, C8, C9)</td>
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<tr>
<td>Industrial placement (C8, C9)</td>
<td>Industrial placement reports (C8, C9)</td>
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Transferable skills

<table>
<thead>
<tr>
<th>Learning and Teaching Processes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (D3, D4, D5, D7)</td>
<td>Laboratory reports (D1, D3, D5, D6)</td>
</tr>
<tr>
<td>Laboratory sessions (D1, D3, D5, D6)</td>
<td>Essays (D2, D3)</td>
</tr>
<tr>
<td>Personal tutorials (D1, D2, D3, D4, D7)</td>
<td>Project reports (individual and group) (D1, D2, D3, D4, D5, D6, D7)</td>
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<tr>
<td>Problem solving classes (D4)</td>
<td>Oral presentations (individual and group) (D1, D3, D6, D7, D8)</td>
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<tr>
<td>Problem-based learning (D1, D2, D3, D4, D5, D6)</td>
<td>Industrial placement reports (D8)</td>
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<tr>
<td>Projects (D1, D2, D3, D4, D5, D6, D7)</td>
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<tr>
<td>Industrial placement (D8)</td>
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### Programme structure

**Level 1 - compulsory units**
All of the units in this pool are mandatory.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP10120</td>
<td>First Year Team Project</td>
<td>20</td>
</tr>
<tr>
<td>COMP15111</td>
<td>Fundamentals of Computer Architecture</td>
<td>10</td>
</tr>
<tr>
<td>COMP16121</td>
<td>Object Oriented Programming with Java 1</td>
<td>20</td>
</tr>
<tr>
<td>COMP16212</td>
<td>Object Oriented Programming with Java 2</td>
<td>10</td>
</tr>
<tr>
<td>COMP18112</td>
<td>Fundamentals of Distributed Systems</td>
<td>10</td>
</tr>
<tr>
<td>BIOL10832</td>
<td>Excitable Cells</td>
<td>10</td>
</tr>
<tr>
<td>PSYC10100</td>
<td>Research Methods</td>
<td>20</td>
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<tr>
<td>PSYC10431</td>
<td>Introduction to Cognition</td>
<td>5</td>
</tr>
<tr>
<td>PSYC11222</td>
<td>Brain and Behaviour</td>
<td>10</td>
</tr>
<tr>
<td>PSYC11322</td>
<td>Sensation &amp; Perception</td>
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**Level 2 options**

**Level 2 - compulsory units**
All of the units in this pool are mandatory.

<table>
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<th>Code</th>
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<tbody>
<tr>
<td>COMP23111</td>
<td>Fundamentals of Databases</td>
<td>10</td>
</tr>
<tr>
<td>COMP23420</td>
<td>Software Engineering</td>
<td>20</td>
</tr>
<tr>
<td>COMP25111</td>
<td>Operating Systems</td>
<td>10</td>
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<tr>
<td>COMP28112</td>
<td>Distributed Computing</td>
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</tr>
<tr>
<td>BIOL22332</td>
<td>Motor Systems for Human Computer Interaction</td>
<td>10</td>
</tr>
<tr>
<td>BIOL22341</td>
<td>Sensory Systems for Human Computer Interaction</td>
<td>10</td>
</tr>
<tr>
<td>PSYC21112</td>
<td>Perception &amp; Action</td>
<td>5</td>
</tr>
<tr>
<td>PSYC21122</td>
<td>Cognitive Neuroscience</td>
<td>10</td>
</tr>
<tr>
<td>PSYC21141</td>
<td>Language &amp; Communication</td>
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</tr>
<tr>
<td>SOST20022</td>
<td>Essentials of Survey Design &amp; Analysis</td>
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</table>

**Level 2 - option pool 1**
From this option pool choose 10 credits.

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP25212</td>
<td>System Architecture</td>
<td>10</td>
</tr>
<tr>
<td>COMP28411</td>
<td>Computer Networks</td>
<td>10</td>
</tr>
<tr>
<td>COMP28512</td>
<td>Mobile Systems</td>
<td>10</td>
</tr>
<tr>
<td>BIOL21321</td>
<td>Membrane Excitability</td>
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**Level 3 options**

**Level 3 - compulsory units**
All of the units in this pool are mandatory.

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<tbody>
<tr>
<td>COMP30030</td>
<td>3rd Year Project (Joint Hons 30 Credits)</td>
<td>30</td>
</tr>
<tr>
<td>COMP33511</td>
<td>User Experience</td>
<td>10</td>
</tr>
<tr>
<td>MCEL30031</td>
<td>Enterprise Management for Computer Scientists</td>
<td>10</td>
</tr>
<tr>
<td>MCEL30032</td>
<td>Managing Finance in Enterprises for Computer Scientists</td>
<td>10</td>
</tr>
<tr>
<td>SOST30022</td>
<td>Advanced Social Network Analysis</td>
<td>20</td>
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</table>

**Level 3 - option pool 1**
From this option pool choose 20 credits.

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP31111</td>
<td>Verified Development</td>
<td>10</td>
</tr>
<tr>
<td>COMP33711</td>
<td>Agile Software Engineering</td>
<td>10</td>
</tr>
<tr>
<td>COMP33812</td>
<td>Software Evolution</td>
<td>10</td>
</tr>
<tr>
<td>COMP34412</td>
<td>Natural Language Systems</td>
<td>10</td>
</tr>
<tr>
<td>COMP36512</td>
<td>Compilers</td>
<td>10</td>
</tr>
<tr>
<td>COMP38120</td>
<td>Documents, Services and Data on the Web</td>
<td>20</td>
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</table>

**Level 3 - option pool 2**
From this option pool choose 20 credits.

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
<th>Theme</th>
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<tbody>
<tr>
<td>BIOL31681</td>
<td>Clocks, Sleep &amp; the Rhythms of Life</td>
<td>10</td>
<td>None</td>
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<tr>
<td>BIOL31692</td>
<td>Learning, Memory &amp; Cognition</td>
<td>10</td>
<td>None</td>
</tr>
<tr>
<td>BIOL31732</td>
<td>Developmental Neurobiology</td>
<td>10</td>
<td>None</td>
</tr>
<tr>
<td>PSYC31122</td>
<td>Emotion</td>
<td>20</td>
<td>None</td>
</tr>
<tr>
<td>PSYC31132</td>
<td>Cases in Clinical Neuropsychology</td>
<td>20</td>
<td>None</td>
</tr>
<tr>
<td>PSYC31142</td>
<td>The Psychology of Time</td>
<td>10</td>
<td>None</td>
</tr>
<tr>
<td>SOAN30811</td>
<td>Anthropology of Vision, Memory and the Senses</td>
<td>20</td>
<td>None</td>
</tr>
<tr>
<td>SOST30031</td>
<td>Modelling Social Inequality</td>
<td>20</td>
<td>None</td>
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</table>

**Level 4 - compulsory units**

All of the units in this pool are mandatory.

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>COMP40901</td>
<td>UG MEng Industrial Project</td>
<td>25</td>
</tr>
<tr>
<td>MCEL40042</td>
<td>Business Feasibility Study</td>
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**Level 4 - option pool 1**

From this option pool choose 45 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP60411</td>
<td>Modelling data on the web</td>
<td>15</td>
</tr>
<tr>
<td>COMP60711</td>
<td>Data Engineering</td>
<td>15</td>
</tr>
<tr>
<td>COMP61011</td>
<td>Foundations of Machine Learning</td>
<td>15</td>
</tr>
<tr>
<td>COMP61021</td>
<td>Modelling and visualization of high-dimensional data</td>
<td>15</td>
</tr>
<tr>
<td>COMP61232</td>
<td>Mobile and Energy Efficient Systems</td>
<td>15</td>
</tr>
<tr>
<td>COMP61242</td>
<td>Mobile Communications</td>
<td>15</td>
</tr>
<tr>
<td>COMP61332</td>
<td>Text Mining</td>
<td>15</td>
</tr>
<tr>
<td>COMP62342</td>
<td>Ontology Engineering for the Semantic Web</td>
<td>15</td>
</tr>
<tr>
<td>COMP62421</td>
<td>Querying Data on the Web</td>
<td>15</td>
</tr>
<tr>
<td>COMP62532</td>
<td>Component-based Software Development</td>
<td>15</td>
</tr>
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**Level 4 - option pool 2**

From this option pool choose 15 credits.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP60532</td>
<td>Principles of Digital Biology</td>
<td>15</td>
</tr>
<tr>
<td>BIOL60771</td>
<td>Advanced Biotechnology</td>
<td>15</td>
</tr>
<tr>
<td>BIOL61820</td>
<td>Bioinformatics for Systems Biology</td>
<td>15</td>
</tr>
<tr>
<td>PSYC60132</td>
<td>Cognitive and Social Neuroscience</td>
<td>15</td>
</tr>
<tr>
<td>SOST70011</td>
<td>Introduction to Statistical Modelling</td>
<td>15</td>
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**Level 4 - option pool 3**

From this option pool choose 15 credits.

<table>
<thead>
<tr>
<th>Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>COMP60542</td>
<td>Introduction to Health Informatics</td>
<td>15</td>
</tr>
<tr>
<td>BIOL60140</td>
<td>Advanced Methods for Biological Sequence Analysis</td>
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</tr>
<tr>
<td>PSYC60142</td>
<td>Clinical and Behavioural Neuroscience</td>
<td>15</td>
</tr>
<tr>
<td>SOST70292</td>
<td>Multilevel Modelling</td>
<td>15</td>
</tr>
</tbody>
</table>

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Mechanisms for programme revision

Course units are reviewed annually by the Undergraduate Committee, as part of the Annual Review process, taking into account the results and comments from Course Unit Evaluation Questionnaires. Input is also received from the Teaching Assessment Panel, which has a responsibility for monitoring teaching quality in the School; similar processes are followed in the other participating Schools.

Programmes have been reviewed regularly by groups created specifically for this purpose; the last major review resulted in a new programme portfolio design which started in the first year in 2008-9. The responsibility for leadership of programme review is now in the hands of the Director of Teaching Strategy (currently Dr Steve Pettifer) who chairs a School Teaching Strategy Committee. On the commencement of each new review, input will be sought from all participating Schools.