F2R1-HRI Master of Science in Human Robot Interaction

PROGRAMME DETAILS
Programme Code: F2R1-HRI
Department: Computer Science
Main Award: MSC - Master of Science
Full Award Title: Master of Science in Human Robot Interaction
Level: Postgraduate Taught

LOCATION OF STUDY
<table>
<thead>
<tr>
<th>Location</th>
<th>Edinburgh</th>
<th>Scottish Borders</th>
<th>Orkney</th>
<th>Dubai</th>
<th>Malaysia</th>
<th>Approved Learning Partner</th>
<th>Independent Distance Learners</th>
<th>Collaborative Learning Partner</th>
<th>Other</th>
</tr>
</thead>
</table>

ASSOCIATED AWARDS
<table>
<thead>
<tr>
<th>Programme Code</th>
<th>Award</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2A3-ZZZ</td>
<td>PGCERT</td>
<td>Postgraduate Certificate in Computer Science</td>
</tr>
<tr>
<td>F2R1-HRI</td>
<td>MSC</td>
<td>Master of Science in Human Robot Interaction</td>
</tr>
<tr>
<td>F2R2-HRI</td>
<td>PGDIP</td>
<td>Postgraduate Diploma in Human Robot Interaction</td>
</tr>
</tbody>
</table>

ACCREDITATION
Accreditation will be sought from The Chartered Institute for IT (a.k.a. BCS) when it next visits Heriot-Watt University in 2020 as part of its 5 year cycle of visits.

LEARNING OUTCOMES – SUBJECT MASTERY
Understanding, Knowledge and Cognitive Skills

- Critical understanding of the main theories, principles and concepts relating to the domain of human robot interaction including terminology, conventions, standards and methodologies.

- Understanding and use of a significant range of the main skills, techniques and practices in robotic software engineering, and a range of specialised skills, research and investigation techniques, and practices in human robot interaction informed by current practices within the AI, HCI and Robotics domains.

- Broad and deep knowledge of the HRI areas of AI, data mining, machine learning, search and optimization, intelligent agents, knowledge representation and inference, planning, as well as application-based knowledge and skills relating to HRI, and specialist knowledge and skills in applications relating to a number of specialist areas such as automation, conversational agents, data visualization and analytics, robotics and virtual reality.

Scholarship, Enquiry and Research (Research Informed Learning)

- Extensive, detailed and critical understanding of at least one specialist area within the domain of HRI application development obtained through researching the background to a substantial and challenging HRI engineering project that incorporates a multimodal interface by personal scholarship, design and development of a detailed HRI solution.

- Detailed knowledge and understanding of intelligent software engineering relating to multimodal interface application developments as well as the practical skills in how to exploit them in support of original and
creative HRI application development.

◦ Specialist and critical knowledge, understanding and skills in a number of mainstream and specialist areas within the domain of HRI application development including robotics, automation, conversational agents, data mining and data visualization.

LEARNING OUTCOMES – PERSONAL ABILITIES

Industrial, Commercial and Professional Practice

◦ Demonstrate critical awareness of current issues within HRI application development, and make informed judgements about them in the light of relevant professional standards.

◦ Demonstrate an awareness of professional and research issues in the HRI discipline, and an ability to critique current techniques and practice.

Autonomy, Accountability and Working With Others

◦ Work autonomously and within teams, as appropriate, demonstrating a capability for both taking and critically reflecting on roles and responsibilities.

◦ Develop and utilise advanced problem-solving skills and techniques in the shared development of original and creative solutions to general and specialist HRI engineering issues.

◦ Develop and demonstrate skills and techniques in communication with peers and academic/industrial staff, using a range of appropriate methods to suit different levels of knowledge and expertise within the audience.

Communication, Numeracy & Information and Communications Technology

◦ Develop and demonstrate the ability to communicate and present the main issues involved in HRI application development to a literate audience with appropriate use of modern presentational tools and aids.

◦ Demonstrate appropriate use of methods of calculation and estimation involved in planning HRI engineering solutions and solving multimodal interface design of such HRI applications as well as study them from a research perspective.

APPROACHES TO TEACHING AND LEARNING

This programme is offered in a traditional campus-based, cohort model. Within the timetable, courses offer traditional lecture-based materials, small group tutorials and a variety of laboratory-based practicals. Students are expected to complete coursework in groups, teams and pairs, as well as individually, and courses offer a range of types of coursework for assessment, from discursive essay-style assignments to code design and generation. In some courses, team teaching approaches are adopted to provide additional support and variety, and electronic support, in the form of email lists, newsgroups and bulletin boards are widely used to disseminate information and support student communication and practice.
EDUCATIONAL AIMS OF THE PROGRAMME

- Detailed knowledge and critical understanding of the main areas of human robot interaction (including theories, principles and concepts). Significant range of principal and specialist skills, techniques and practices in the HRI domain.

- Specialist knowledge of HRI techniques as they apply to developing interactive multimodal interfaces and HRI applications.

- Ability to critically review existing practice and develop original and creative solutions to problems within the human robot interaction domain.

- Ability to communicate and work effectively with peers and academic staff in a variety of tasks, demonstrating appropriate levels of autonomy and responsibility.

- Ability to plan and execute a significant project of research, investigation or development in a specialist area within artificial intelligence, demonstrating extensive, detailed and critical understanding of that specialism.
ASSESSMENT POLICIES

Postgraduate programmes consist of two phases:

- A *taught phase*, consisting of a set of 8 taught courses, some mandatory and some optional, defined in the programme structure, which the students will study over two semesters. Assessment of the taught phase is through a variety of methods including coursework and/or examination. Students must submit all elements of assessment before being permitted to progress.

- A *dissertation phase*, consisting of an appropriate technical research project and project dissertation report.

- Students will normally complete the taught phase, at which point progression to the dissertation phase is dependent on assessed performance as being of Masters level standard. To progress students must get grade D or better in the 8 taught courses, get a taught course average of 50% and pass F21RP with a mark of at least 45%.

- Any student will be able to retake the assessment of up to a maximum of 3 courses at the next opportunity, subject to payment of the appropriate fees to the University, and may be required to do so to obtain the necessary credits for completion of their programme or for progression. Students may only resit courses for which their examination grade is E or F (or a D but only if that is required for them to qualify for an MSc degree). The method of reassessment for each course is specified in the appropriate course descriptor.

- Students meeting the required standards for Postgraduate Diploma and Postgraduate Certificate in the taught phase, but not meeting the Masters standard, will not be permitted to progress to the dissertation phase. Students may be recommended to graduate with a Postgraduate Diploma or a Postgraduate Certificate at this point.

- Students failing to meet the required standards for Postgraduate Diploma and Postgraduate Certificate in coursework and examination in the taught phase will not be permitted to progress to the dissertation phase, nor will they be eligible for any award.

PROGRAMME STRUCTURE

<table>
<thead>
<tr>
<th>Mandatory Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Code</strong></td>
</tr>
<tr>
<td>X 1 1</td>
</tr>
<tr>
<td>X 1 1</td>
</tr>
<tr>
<td>X 1 2</td>
</tr>
<tr>
<td>X 1 2</td>
</tr>
<tr>
<td>X 1 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optional Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Code</strong></td>
</tr>
<tr>
<td>X 1 1</td>
</tr>
</tbody>
</table>
X 1 1 F21DL Data Mining and Machine Learning 15 11
X 1 1 F21GA 3D Graphics and Animation 15 11
X 1 1 F21SA Statistical Modelling and Analysis 15 11
X 1 1 F29AI Artificial Intelligence and Intelligent Agents 15 9
X 1 2 B31SE Image Processing 15 11
X 1 2 F21AD Advanced Interaction Design 15 11
X 1 2 F21BD Big Data Management 15 11
X 1 2 F21GP Computer Games Programming 15 11

COMPOSITION NOTES(PG)

8 taught courses (4 mandatory and 4 optional) plus MSc Dissertation

<table>
<thead>
<tr>
<th></th>
<th>Mandatory Credits</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Optional Credits</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Elective Credits</td>
<td></td>
</tr>
<tr>
<td>Dissertation Credits</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>180</td>
</tr>
</tbody>
</table>

AWARDS, CREDITS AND CRITERIA(PG)

<table>
<thead>
<tr>
<th></th>
<th>Overall Credits</th>
<th>Specific Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters Degree</td>
<td>180</td>
<td>180 SCQF credits including a minimum of 150 credit at Level 11</td>
</tr>
<tr>
<td>Postgraduate Diploma</td>
<td>120</td>
<td>120 SCQF credits including a minimum of 90 credit at Level 11</td>
</tr>
<tr>
<td>Postgraduate Certificate</td>
<td>60</td>
<td>60 SCQF credits including a minimum of 40 credit at Level 11</td>
</tr>
</tbody>
</table>

Award Requirements

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Overall</th>
<th>Overall</th>
<th>Basis of Overall Mark/Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Course</td>
<td>Mark</td>
<td>Grade</td>
<td></td>
</tr>
<tr>
<td>Total Course</td>
<td>Passes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master (Distinction)</td>
<td>8+Diss</td>
<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C (at the 1st attempt) plus a Dissertation at grade A.</td>
</tr>
<tr>
<td>Master</td>
<td>8+Diss</td>
<td>50</td>
<td>C</td>
<td>Credit Weighted Average greater than or equal 50% over 8 courses at grades A-D plus a Dissertation at minimum grade C.</td>
</tr>
<tr>
<td>Diploma (Distinction)</td>
<td>8</td>
<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C (at the 1st attempt)</td>
</tr>
<tr>
<td>Diploma</td>
<td>8</td>
<td>40</td>
<td>D</td>
<td>Credit Weighted Average greater than or equal 40% over 8 courses at grades A-E</td>
</tr>
<tr>
<td>Certificate</td>
<td>4</td>
<td>40</td>
<td>D</td>
<td>Credit Weighted Average greater than or equal 40% over 4 courses at grades A-E</td>
</tr>
</tbody>
</table>

DURATION OF STUDY

<table>
<thead>
<tr>
<th></th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Diploma</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Certificate</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

RE-ASSESSMENT (PG)

1. A student who has been awarded a Grade E or F in a course may be re-assessed in that course. A student who has been awarded a Grade D in a course my be re-assessed in that course in order to proceed to or be eligible to receive the award of Masters.
2. A student shall be permitted only one re-assessment opportunity in a maximum of three taught courses. The opportunity for re-assessment in four or more taught courses shall be at the discretion of the Progression Board.
3. Any further re-assessment opportunities in a course will require the approval of the Postgraduate Studies Committee.
4. A student may be permitted, at the discretion of the Progression Board, to be re-assessed in the dissertation, project or other supervised research component of the course of study.

PROGRESSION TO DISSERTATION/PROJECT

Students may progress to the Dissertation if they have met the progression requirements (taught course credit weighted average of 50% or better, all courses at Grade D or above and 45% or better in F21RP)