<table>
<thead>
<tr>
<th>Mandatory Courses &amp; Dissertation/Project</th>
<th>Credit Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Course Title</td>
<td>SCQF</td>
</tr>
<tr>
<td>√ 1</td>
<td>F29AI Artificial Intelligence &amp; Intelligent Agents</td>
<td>15</td>
</tr>
<tr>
<td>√ 1</td>
<td>F21DL Data Mining &amp; Machine Learning</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21CA Conversational Agents &amp; Spoken Language Processing</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21RP Research Methods and Project Planning</td>
<td>15</td>
</tr>
<tr>
<td>√ 3</td>
<td>F21MP Masters Project &amp; Dissertation</td>
<td>60</td>
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<table>
<thead>
<tr>
<th>Optional Courses</th>
<th>Credit Value</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Code</td>
<td>Course Title</td>
<td>SCQF</td>
</tr>
<tr>
<td>√ 1</td>
<td>F21BC Biologically Inspired Computation</td>
<td>15</td>
</tr>
<tr>
<td>√ 1</td>
<td>F21DV Data Visualisation and Analytics</td>
<td>15</td>
</tr>
<tr>
<td>√ 1</td>
<td>F21SC Industrial Programming</td>
<td>15</td>
</tr>
<tr>
<td>√ 1</td>
<td>F21MC Mobile Communications and Programming</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21AD Advanced Interaction Design</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21GP Computer Games Programming</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21RO Intelligent Robotics</td>
<td>15</td>
</tr>
<tr>
<td>√ 2</td>
<td>F21SM Software Engineering Master Class</td>
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</tr>
<tr>
<td>√ 2</td>
<td>F21VE Virtual and Augmented Realities</td>
<td>15</td>
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</table>

8. Composition

8 taught courses (5 mandatory + 3 optional) plus a dissertation

9. Awards, Credits & Level

The awards, credits and level for this programme is in line with University Regulations as set out below (please tick)

Yes √ No

If you have selected "No" please amend the statement below and highlight changes.

Masters Degree 180 SCQF Credits including a minimum of 150 SCQF credits at Level 11
Postgraduate Diploma 120 SCQF Credits including a minimum of 90 SCQF credits at Level 11
Postgraduate Certificate 60 SCQF Credits including a minimum of 40 SCQF credits at Level 11
Form P7  Heriot-Watt University – Postgraduate Programme Structure & Notes Template

1. Programme Code(s) (recruitment & exit awards)
   F2A1-ASM / F2A2-ASM / F2A3-ZZZ

2. Programme Titles for all awards (unabbreviated)
   MSc / Postgraduate Diploma Artificial Intelligence with Speech and Multimodal Interaction / Postgraduate Certificate Computer Science

3. Main Award(s) (to be recruited to)
   MSc F2A1-ASM / PG Diploma F2A2-ASM

4. Exit Awards (graduation only)
   PG Certificate F2A3-ZZZ

5. Type
   School Specialist Degree

6. Date of Production
   26 August 2014

10. PROGRAMME ACCREDITED BY
   Computing

12. LEVEL OF COURSES
<table>
<thead>
<tr>
<th>Level</th>
<th>Full-time</th>
<th>Part-time</th>
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</thead>
<tbody>
<tr>
<td>11</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>Levels 7-10(UG)</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Mixed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
   Courses not at level 11: (include codes) F29AI AI and Intelligent Agents

15. DURATION OF STUDY (MONTHS)
<table>
<thead>
<tr>
<th>Standard</th>
<th>Maximum</th>
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<tbody>
<tr>
<td>Full-time</td>
<td>Part-time</td>
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<tr>
<td>Masters</td>
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<tr>
<td>Diploma</td>
<td>9</td>
</tr>
<tr>
<td>Certificate</td>
<td>6</td>
</tr>
</tbody>
</table>

PROGRAMME NOTES

16. NOMINAL PASS MARK/GRAD (Highlight Changes)

<table>
<thead>
<tr>
<th>Mark</th>
<th>Grade</th>
<th>Coursework:</th>
<th>Examination:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td>50% C</td>
<td>various</td>
<td>various</td>
</tr>
<tr>
<td>Diploma</td>
<td>40% D</td>
<td>Courses on the programme may be assessed by coursework only, or by a mixture of coursework and examination.</td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td>40% D</td>
<td>For courses assessed by an examination, an explicit summative assessment is held at the end of the relevant semester. This is weighted with assessed coursework marks to provide a final course mark. There is a nominal pass mark on a per course basis. However, assessment marks are averaged for progression purposes.</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>40% D</td>
<td>For courses assessed by coursework only (including the project courses), summative assessment within and at the end of the course will provide a mark and grade.</td>
<td></td>
</tr>
</tbody>
</table>

18. RE-ASSESSMENT OPPORTUNITIES
The re-assessment policy for this programme is in line with University Regulations as set out below (please tick) Yes ✔ No

If you have selected "No" please amend the statement below and highlight changes.

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 may 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 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.

19. AWARD CRITERIA
The award criteria for this programme is in line with University Regulations as set out below (please tick) Yes ✔ No

If you have selected "No" please amend the statement below and highlight changes.

<table>
<thead>
<tr>
<th>Total Course Passes</th>
<th>Overall Mark/Grade</th>
<th>Basis of Overall Mark/Grade</th>
<th>Other Requirements</th>
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</thead>
<tbody>
<tr>
<td>Master (Distinction):</td>
<td>8 + Dissertation</td>
<td>&gt;= 70% / A</td>
<td>Credit weighted average &gt;=70% over 8 courses plus a dissertation/projects at grade A-C</td>
</tr>
<tr>
<td>Master:</td>
<td>8 + Dissertation</td>
<td>&gt;= 50% / C</td>
<td>Credit weighted average &gt;=50% over 8 courses at grades A-D plus a dissertation/projects at minimum grade C</td>
</tr>
<tr>
<td>Diploma (Distinction):</td>
<td>8</td>
<td>&gt;= 70% / A</td>
<td>Credit weighted average &gt;=70% over 8 courses at grades A-C</td>
</tr>
<tr>
<td>Diploma:</td>
<td>8</td>
<td>&gt;= 40% / D</td>
<td>Credit weighted average &gt;=40% over 8 courses at grades A-E</td>
</tr>
<tr>
<td>Certificate:</td>
<td>4</td>
<td>&gt;= 40% / D</td>
<td>Credit weighted average &gt;=40% over 4 courses at grades A-E</td>
</tr>
</tbody>
</table>
1. Programme Code(s) (recruitment & exit awards)
   F2A1-ASM / F2A2-ASM / F2A3-ZZZ

2. Programme Titles for all awards (unabbreviated)
   MSc / Postgraduate Diploma Artificial Intelligence with Speech and Multimodal Interaction / Postgraduate Certificate in Computer Science

3. Main Award(s) (to be recruited to)
   MSc F2A1-ASM / PG Diploma F2A2-ASM

4. Exit Awards (graduation only)
   PG Certificate F2A3-ZZZ

5. Type
   School Specialist Degree

6. Date of Production
   26 August 2014

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### 20. COURSE CHOICE/DISSERTATION

Students must take the 2 mandatory courses each in Semester 1 and Semester 2 (including a Semester 2 course on Research Methods). They must also select 4 from the available optional courses, 2 in Semester 1 and 2 in Semester 2. This selection is made at the beginning of the relevant semester with the possibility of changing the selection supported for a two-week period. Selection of a course depends on fulfilling the course knowledge and skill pre-requisites.

The Masters dissertation should be in the specialist topic area of the MSc namely Artificial Intelligence and address Spoken Language and/or Multimodal Interaction issues. It counts as 600 effort hours. Students may only progress 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). Students select a dissertation title in Semester 2, either internally from a list generated by the academic staff, by personally generating a topic and agreeing this with an academic supervisor, or externally with an industrial placement agreed with their Programme Director. Detailed guidelines on the conduct of the project and the production of the dissertation project are provided to the student, together with guidance on the level of support that they can expect to receive from their academic supervisor.

Dissertation marks are awarded with 90% of the marks coming from the dissertation itself, and 10% of the marks coming from a poster presentation and demonstration of the work. Dissertation marking is a two phase process – the academic supervisor provides a mark based predominantly on the project, in terms of technical quality, level of work undertaken, level of independence and responsibility of the student, with 25% of the marks being based on the quality of the dissertation document – the second reader concentrates primarily on the dissertation document, quality, style, accuracy, honesty, completeness, academic rigour, referencing, etc., with 25% of their marks being assigned to the technical quality of the project and level of work undertaken, as evidenced from the document. Once these marks have been produced, if they are within an acceptable range of one another (that range being determined by the Postgraduate Board of Studies and agreed with the External Examiner) then the marks are averaged to produce a single dissertation mark.

If the marks difference is outside the range specified, and the academic markers state there is not enough flexibility in their marks to overcome this problem, or the mark thus generated would affect the level of award achieved by the student, then a third reader will be introduced. The third reader marks to the same criteria as the second reader, as the dissertation document is regarded as the major academic instrument of record, and the mark produced by the third reader will be averaged with the original marks to produce the single dissertation mark. In all situations where a third reader is introduced the details of the marking process will be presented to the External Examiner at the Exam Board and, especially where the level of award for the student is affected, the External Examiner will be given the opportunity to review the dissertation document and comment specifically on the marking process and the appropriateness of the outcome.

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### 21. ADDITIONAL INFORMATION

All additional information relating to the programme can be found in the School Postgraduate Handbook and the Programme handbook, both of which are available to students online through Information for Current Postgraduate students on the Computer Science website.
**Form P10**

**Heriot-Watt University – Programme Description Template**

**Version 4.0 (2010/2011)**

1. **Programme Code(s) (recruitment & exit awards)**
   F2A1-ASM / F2A2-ASM / F2A3-ZZZ

2. **Programme Titles for all awards (unabbreviated)**
   MSc / Postgraduate Diploma Artificial Intelligence with Speech and Multimodal Interaction / Postgraduate Certificate in Computer Science

3. **Main Award(s) (to be recruited to)**
   MSc F2A1-ASM / PG Diploma F2A2-ASM

4. **Exit Awards (for graduation only)**
   PG Certificate F2A3-ZZZ

5. **Type**
   School Specialist Degree

6. **Programme Accredited by**
   Mathematical and Computer Sciences

7. **UCAS Code**
   Computing

8. **QAA Subject Benchmarking Group(s)**
   Computing

9. **Date of Production/Revision**
   August 2014/201415

10. **Educational Aims of the Programme**

   ♦ Detailed knowledge and critical understanding of the main areas of artificial intelligence (including theories, principles and concepts).
   ♦ Significant range of principal and specialist skills, techniques and practices in the AI domain.
   ♦ Specialist knowledge of AI techniques as they apply to developing interactive multimodal and spoken interfaces.
   ♦ Ability to critically review existing practice and develop original and creative solutions to problems within the AI and spoken multimodal interface 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.

12. **The Programme provides opportunities for learners to achieve the following outcomes:**

   **Subject Mastery**

   ♦ Critical understanding of the main theories, principles and concepts relating to the domain of artificial intelligence including terminology, conventions, standards and methodologies.
   ♦ Understanding and use of a significant range of the main skills, techniques and practices in intelligent software engineering, and a range of specialised skills, research and investigation techniques, and practices in speech and multimodal interaction informed by current practices within the AI and HCI domains.
   ♦ Broad and deep knowledge of the AI areas of data mining, machine learning, search and optimization, intelligent agents, knowledge representation and inference, planning, as well as application-based knowledge and skills relating to speech and multimodal interaction, and specialist knowledge and skills in applications relating to a number of specialist areas such as automation, biologically inspired computation, conversational agents, data visualization and analytics, robotics, spoken language processing and virtual reality.

   **Scholarship, Enquiry and Research**

   ♦ Extensive, detailed and critical understanding of at least one specialist area within the domain of AI application development obtained through researching the background to a substantial and challenging AI engineering project that incorporates a multimodal spoken interface by personal scholarship, design and development of a detailed AI solution.
   ♦ Detailed knowledge and understanding of intelligent software engineering relating to spoken and multimodal interface application developments as well as the practical skills in how to exploit them in support of original and creative AI application development.
   ♦ Specialist and critical knowledge, understanding and skills in a number of mainstream and specialist areas within the domain of AI application development including automation, conversational agents, robotics, spoken language processing, data mining and data visualization.
### Personal Abilities

#### Industrial, Commercial and Professional Practice
- Demonstrate critical awareness of current issues within AI 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 AI 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 AI 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 and ICT
- Develop and demonstrate the ability to communicate and present the main issues involved in AI 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 AI engineering solutions and solving speech and multimodal interface design of such AI applications.

### 13. 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.
<table>
<thead>
<tr>
<th>1. Programme Code(s) (recruitment &amp; exit awards)</th>
<th>2. Programme Titles for all awards (unabbreviated)</th>
<th>3. Main Award(s) (to be recruited to)</th>
<th>4. Exit Awards (for graduation only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F2A1-ASM / F2A2-ASM / F2A3-ZZZ</td>
<td><strong>MSc</strong> / Postgraduate Diploma Artificial Intelligence with Speech and Multimodal Interaction / Postgraduate Certificate in Computer Science</td>
<td><strong>MSc F2A1-ASM</strong> / <strong>PG Diploma F2A2-ASM</strong></td>
<td><strong>PG Certificate F2A3-ZZZ</strong></td>
</tr>
</tbody>
</table>

### 5. Type
- **School Specialist Degree**

### 6. Programme Accredited by
- **Mathematical and Computer Sciences**

### 7. UCAS Code
- **Computing**

### 8. School
- **Mathematical and Computer Sciences**

### 9. QAA Subject Benchmarking Group(s)
- **Computing**

### 10. Date of Production/Revision
- **August 2014/201415**

**14. 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 two stages: an appropriate technical research project and project dissertation report, and a poster and demonstration-based presentation.

- Students will normally complete the taught phase, at which point progression to the dissertation phase is dependent on assessed performance. To progress students must meet the criteria stipulated in point 9 below in the taught material.

- Students meeting the required standards for Masters in the taught phase (set out in point 9 below) will be permitted to progress to the dissertation phase.

- Students meeting the required standards for Postgraduate Diploma and Postgraduate Certificate (set out in point 9 below) 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 (set out in point 9 below) 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.

- 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.
1. To obtain an MSc Degree, candidates must gain 180 credits and must satisfy the examiners by achieving the required standards (set out in point 9 below) in two components:
   - Assessed taught material
   - Dissertation (set out in point 9 below)
2. To obtain a Postgraduate Diploma candidates must gain 120 credits and must satisfy the examiners by achieving the required standards (set out in point 9 below) in the assessed taught material.
3. To obtain a Postgraduate Certificate candidates must gain 60 credits and must satisfy the examiners by achieving the required standards (set out in point 9 below) in one component:
   - Assessed taught material
   - The Examiners may specify certain courses as mandatory to achieve the award of Postgraduate Certificate, to properly reflect the nature of the course.
4. Taught courses will be assessed by a variety of techniques appropriate to the learning outcomes of the specific course. Where a course is assessed by more than one component (for example examination and coursework or more than one item of coursework) students must complete each element of the assessment to a satisfactory level (Grade E or higher) to be permitted to proceed.
5. All course work must be submitted before the due date. Late submissions will only be accepted with the prior permission of the Programme Director.
6. In exceptional personal or medical circumstances students may be granted leave by the examiners to resit part or all of the assessment on one occasion only and at a date decided by the examiners, as stated in university regulations 4 and 5. This provision is in addition to the provision that students may retake assessment for courses in which they have achieved a grade less than D.
7. Dissertations must be submitted on or before the publicised submission date; dissertations submitted after that date and without the prior consent of the Programme Director may be assessed at a penalty.
8. Allowance for poor performance in or non-submission of a component on medical grounds is normally made only where supported by written testimony from a professional health practitioner. Such testimony must be lodged with the Programme Director prior to the Examination Board meeting.
9. The level of achievement expected in each component is an average of:
   - 40% for the Postgraduate Diploma and Certificate
   - 50% for the MSc Degree
   - MSc candidates displaying exceptional merit by obtaining a credit weighted average of 70% or more (at the first attempt) over 8 courses and the dissertation at grades A-C may be recommended for the award of MSc with Distinction. Postgraduate Diploma candidates displaying exceptional merit by obtaining a credit weighted average of 70% or more (at the first attempt) over 8 courses at grades A-C may be recommended for the award of Postgraduate Diploma with Distinction. Both distinction awards are at the discretion of the Exam Board.
### Programme Code(s) (recruitment & exit awards)

F2A1-ASM / F2A2-ASM / F2A3-ZZZ

### Programme Titles for all awards (unabbreviated)

MSc / Postgraduate Diploma Artificial Intelligence with Speech and Multimodal Interaction / Postgraduate Certificate in Computer Science

### Main Award(s) (to be recruited to)

MSc F2A1-ASM / PG Diploma F2A2-ASM

### Exit Awards (for graduation only)

PG Certificate F2A3-ZZZ

<table>
<thead>
<tr>
<th>5. Type</th>
<th>6. Programme Accredited by</th>
<th>7. UCAS Code</th>
<th>8. School</th>
<th>9. QAA Subject Benchmarking Group(s)</th>
<th>10. Date of Production/Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Specialist Degree</td>
<td></td>
<td></td>
<td>Mathematical and Computer Sciences</td>
<td>Computing</td>
<td>August 2014/201415</td>
</tr>
</tbody>
</table>

### Required Standards:

Candidates must achieve the following minimum levels of performance in:

**Assessed Taught Material**

- A credit weighted average across the 8 courses of 50% or better for Masters, with F21RP Research Methods at 45% or above and all others at grade D or above.
- A credit weighted average across the 8 courses of 40% or better for Postgraduate Diploma (120 credits) or a credit weighted average across 4 courses of 40% or better for Postgraduate Certificate (60 credits), with no course returning a result of less than grade E.
- All elements of assessment for each course must be completed to a satisfactory level (grade E).

**Dissertation**

- An average of 50% or better for Masters
- The Dissertation is conducted in two stages, these being:
  - Stage 1: A write up in a dissertation report (90%)
  - Stage 2: A poster presentation and demonstration of the project work and results (10%)

*The accompanying Programme Structure template provides details of courses, awards and credits for the programme.*

*The accompanying Programme Notes provide details of stage notes, progression requirements and award requirements for the programme.*