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| <b>PROGRAMME SPECIFICATION<br/>(Taught Postgraduate)</b> |  <b>Newcastle<br/>University</b> |
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| <b>1</b> | <b>Awarding Institution</b>     | Newcastle University                                    |
| <b>2</b> | <b>Teaching Institution</b>     | Newcastle University                                    |
| <b>3</b> | <b>Final Award</b>              | MSc                                                     |
| <b>4</b> | <b>Programme Title</b>          | Robotics and AI<br>Robotics and AI Science (exit award) |
| <b>5</b> | <b>Programme Code</b>           | 5524F<br>5526F (exit award)                             |
| <b>6</b> | <b>Programme Accreditation</b>  | N/A                                                     |
| <b>7</b> | <b>QAA Subject Benchmark(s)</b> | N/A                                                     |
| <b>8</b> | <b>FHEQ Level</b>               | 7                                                       |
| <b>9</b> | <b>Last updated</b>             | June 2024                                               |

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| <b>10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Programme Aims</b> |
| <p>The programme aims:</p> <ol style="list-style-type: none"> <li>1. To gain an advanced knowledge and understanding of specialist topics in Robotics and AI;</li> <li>2. To develop transferable skills in research and knowledge acquisition;</li> <li>3. To satisfy the professional development needs of the individual and their employers; providing relevant training to engineering graduates who wish to pursue a career in the fields of AI and robotics; and</li> <li>4. To provide a foundation for further postgraduate studies.</li> </ol> |                       |

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| <b>11</b>                                                                                                                                                                                             | <b>Learning Outcomes</b>                                                                                                                                                                                                             |
| <p>The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes associated with the theme of Robotics and AI.</p> |                                                                                                                                                                                                                                      |
| <b>Knowledge and Understanding</b>                                                                                                                                                                    |                                                                                                                                                                                                                                      |
| <p>On completing the programme students should have gained and be able to demonstrate:</p>                                                                                                            |                                                                                                                                                                                                                                      |
| A1                                                                                                                                                                                                    | A knowledge and understanding of advanced topics in the field of Robotics and AI selected from: Industrial automation, PLCs and Robotics, Mechatronics Engineering, Machine Learning, Linear Control Design, Applied AI and Robotics |
| A2                                                                                                                                                                                                    | The technical expertise that underpins informed project planning, design and decision making in the area of AI and robotics                                                                                                          |
| A3                                                                                                                                                                                                    | Expertise with the use of computer packages towards development of design solutions for AI analysis and control and robotics applications.                                                                                           |
| A4                                                                                                                                                                                                    | A particular topic connected with AI and robotics studied in-depth as part of a research project.                                                                                                                                    |
| <b>Teaching and Learning Methods</b>                                                                                                                                                                  |                                                                                                                                                                                                                                      |
| <p>Acquisition of A1 to A4 is through a combination of lectures, tutorials, student centred learning, coursework and project work.</p>                                                                |                                                                                                                                                                                                                                      |

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| <b>Assessment Strategy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <p>Formative assessment in particular areas occurs through tutorial exercises (computer based and written) and coursework. The primary means of assessing factual knowledge is through closed book written examination. This is supported through assessed coursework and case studies.</p> <p>In depth individual learning forms part of the research project, which is assessed by a literature survey, a presentation exercise, dissertation and oral examination. (A1-A4).</p>                                                                                                                                                                                                                                                                                      |  |
| <b>Intellectual Skills</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <p>On completing the programme students should be able to:</p> <p>B1 Select and apply appropriate methods for modelling and analysing problems in robotics and AI.</p> <p>B2 Use scientific principles in the modelling and analysis of robotic systems and in the development of AI solutions</p> <p>B3 Select and apply appropriate methods for developing robotics and AI solutions to practical problems</p> <p>B4 Produce engineering solutions to problems through the application of knowledge and understanding in robotics and AI.</p> <p>B5 Create new designs in AI and robotics through synthesis of ideas from a wide range of sources</p> <p>B6 Develop ideas and opinions through the critical appraisal of information from a wide range of sources</p> |  |
| <b>Teaching and Learning Methods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <p>Acquisition of B1 to B6 is through a combination of lectures, tutorials, coursework and project work.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <b>Assessment Strategy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <p>Intellectual abilities are assessed through a mixture of written examinations, coursework assignments. The research project, which is assessed by dissertation and oral examination, provides evidence of the ability to carry out a research project (B1-B6).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| <b>Practical Skills</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <p>On completing the programme students should be able to:</p> <p>C1 Use relevant test and measurement equipment</p> <p>C2 Use software packages relevant to robotics and AI</p> <p>C3 Plan, execute and report a research project</p> <p>C4 Design solutions to systems or components in selected areas of robotics and AI</p> <p>C5 Search for and retrieve information from a wide range of sources</p>                                                                                                                                                                                                                                                                                                                                                              |  |
| <b>Teaching and Learning Methods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <p>Acquisition of C1 to C5 is through a combination of lectures, tutorials, coursework and project work.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <b>Assessment Strategy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <p>C1 to C5 are not explicitly assessed but are necessary for successful completion of coursework and project.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <b>Transferable/Key Skills</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| <p>On completing the programme students should be able to:</p> <p>D1 Communicate effectively</p> <p>D2 Critically appraise information from a wide range of sources</p> <p>D3 Create and innovate in problem solving</p> <p>D4 Use general IT tools such as word processors, spreadsheets</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |

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| D5    Manage time and resources                                                                            |
| <b>Teaching and Learning Methods</b>                                                                       |
| D1 to D5 are introduced and developed via a combination of tutorial examples, coursework and project work. |
| <b>Assessment Strategy</b>                                                                                 |
| Skills D1 to D3 are necessary to complete examinations and assignments to a satisfactory standard          |
| Skills D4 and D5 are essential for satisfactory completion of the project                                  |

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| <b>12    Programme Curriculum, Structure and Features</b>                                                                                                                                                                                                                                                                |
| <b>Basic structure of the programme</b>                                                                                                                                                                                                                                                                                  |
| The course comprises 100 taught credits, plus 20 credits of laboratory based coursework. MSc students also complete an individual project with dissertation (60 credits).                                                                                                                                                |
| The course is offered once per year in a three semester structure with all lectured material and the research methods module being in semesters 1 and 2. The project will take place in Semester 2 and 3.                                                                                                                |
| <b>Key features of the programme (including what makes the programme distinctive)</b>                                                                                                                                                                                                                                    |
| This programme is aimed at students who wish to pursue advanced studies in the area of Automation and Control.                                                                                                                                                                                                           |
| Advanced knowledge and understanding (A1 to A3) of specialist topics in Automation and Control are gained primarily through the selected modules. This is reinforced through tutorial exercises and coursework assignments.                                                                                              |
| Intellectual abilities (B1 to B6) are introduced through the chosen modules and are reinforced through tutorial exercises, coursework assignments. Tutorial exercises and coursework assignments also develop practical skills (C1, C2, C4, C5) and transferable skills (D1 to D5)                                       |
| The research project involves individual acquisition of knowledge and abilities (A2 to A4, B1 to B5), project planning and execution (C3). Experience is also gained of practical skills (C1 to C5). Satisfactory completion of the dissertation and examination requires command of the transferable skills (D1 to D5). |
| <b>Programme regulations (link to on-line version)</b>                                                                                                                                                                                                                                                                   |
| <a href="#">-R5524F.pdf</a>                                                                                                                                                                                                                                                                                              |

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| <b>13    Support for Student Learning</b>                                                                                         |
| Generic information regarding University provision is available at the following link.<br><br><a href="#">Generic Information</a> |

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| <b>14    Methods for evaluating and improving the quality and standards of teaching and learning</b>                              |
| Generic information regarding University provision is available at the following link.<br><br><a href="#">Generic Information</a> |

*Accreditation reports*

*Additional mechanisms*

## **15 Regulation of assessment**

Generic information regarding University provision is available at the following link.

[Generic Information](#)

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

The University Prospectus: [Find a Degree | Postgraduate | Newcastle University \(ncl.ac.uk\)](#)  
Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

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.