Bournemouth University

# Programme Specification – Section 1

## KEY PROGRAMME INFORMATION

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| **Originating institution(s)**<br>Bournemouth University | **Faculty responsible for the programme**<br>Faculty of Science and Technology |
| **Final award(s), title(s) and credits**<br>BEng (Hons) Mechatronics and Robotics – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 / 120 (60 ECTS) Level 6 credits | |
| **Intermediate award(s), title(s) and credits**<br>Dip HE Mechatronics and Robotics – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits<br>Cert HE Mechatronics and Robotics – 120 (60 ECTS) Level 4 credits | |
| **UCAS Programme Code(s) (where applicable and if known)** | **HECoS (Higher Education Classification of Subjects) Code and balanced or major/minor load**<br>100170 (100%) |
| **External reference points**<br>UK Quality Code for Higher Education;<br>Part A: Setting and Maintaining Academic Standards;<br>Chapter A1: UK and European reference points for academic standards (May 2015) - incorporates the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (Qualification Frameworks), Foundation Degree qualification benchmark, Master's Degree Characteristics and Subject Benchmark Statements;<br>Subject benchmark statements - Engineering (2023);<br>UK Standard for Professional Engineering Competence and Commitment (UK-SPEC): The Accreditation of Higher Education Programmes (AHEP) forth edition from the Engineering Council UK (August 2020).. | |
| **Professional, Statutory and Regulatory Body (PSRB) links**<br>Accreditation will be sought from the Institution of Engineering Designers (IED) and the Institution of Mechanical Engineers (IMechE) to meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) in 2025. | |
| **Places of delivery**<br>Bournemouth University, Talbot Campus | |
| **Mode(s) of delivery**<br>Full-time/Full-time sandwich | **Language of delivery**<br>English |
| **Typical duration**<br>Programme duration: 3 years full-time / 4 years full-time sandwich<br>Level 4: 1 year<br>Level 5: 1 year<br>Optional sandwich placement: 1 year<br>Level 6: 1 year | |
| **Date of first intake**<br>September 2025 | **Expected start dates**<br>September |
| **Maximum student numbers**<br>Not applicable | **Placements**<br>Optional sandwich placement in industry between level 5 and 6 (30 weeks minimum). Students are expected to search for suitable placement opportunities, with the support of the Faculty placements team. |
| **Partner(s)**<br>Not applicable | **Partnership model**<br>Not applicable |
| **Date of this Programme Specification**<br>June 2024 | |
| **Version number**<br>v1.0-0925 | |
| **Approval, review or modification reference numbers**<br>E232435 | |
| **Author**<br>Dr Roya Haratian, Dr Nigel Garland and Dr Diogo Montalvão | |

## PROGRAMME STRUCTURE

| **Programme Award and Title:** BEng (Hons) Mechatronics and Robotics | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Year 1/Level 4**<br>Students are required to complete all 6 core units | | | | | | | | | |
| **Unit Name** | **Core/ Option** | **No of credits** | **Assessment Element Weightings** | | | | **Expected contact hours per unit** | **Unit version no.** | **HECoS Code (plus balanced or major/minor load)** |
| | | | **Exam 1** | **Exam 2** | **Cwk 1** | **Cwk 2** | | | |
| Engineering Design with Practice | Core | 20 | | | 60 | 40 | 50 | 2.0 | 100182 |
| Engineering Principles A | Core | 20 | 100 | | Pass/Fail | | 50 | 2.0 | 100430 (balanced)<br>100431 (balanced) |
| Mechatronics and Robotics Principles | Core | 20 | 50 | | 50 | | 50 | 1.0 | 100430 (balanced)<br>100170 (balanced) |
| Materials with Practice | Core | 20 | 60 | | 40 | | 50 | 2.0 | 100203 (balanced)<br>100184 (balanced) |
| Electrical and Electronic Principles | Core | 20 | | | 50 | 50 | 50 | 3.0 | 100163 |
| Engineering Mathematics | Core | 20 | 60 | | 40 | | 40 | 3.0 | 101028 |
| **Progression requirements:** Requires 120 credits at Level 4<br>**Exit qualification:** Cert HE Mechatronics and Robotics (requires 120 credits at Level 4) | | | | | | | | | |

**Year 2/Level 5**
Students are required to complete all 6 core units

| Unit Name | Core/ Option | No of credits | Assessment Element Weightings | | | | Expected contact hours per unit | Unit version no. | HECoS Code (plus balanced or major/minor load) |
|---|---|---|---|---|---|---|---|---|---|
| | | | Exam 1 | Exam 2 | Cwk 1 | Cwk 2 | | | |
| Robotic Digital Control | Core | 20 | | | 50 | 50 | 50 | 1.0 | 100170 |
| Stress and Dynamics | Core | 20 | 70 | | 30 | | 50 | 4.0 | 100190 |
| Engineering Simulation | Core | 20 | | | 50 | 50 | 50 | 3.0 | 100182 (balanced)<br>100163 (balanced) |
| Engineering Design Tools | Core | 20 | | | 100 | | 50 | 2.0 | 100182 |
| Management and Commercialisation | Core | 20 | | | 100 | | 40 | 2.0 | 101221 (balanced)<br>100078 (balanced) |
| Engineering Mathematics for Mechanical Systems Design | Core | 20 | | | 50 | 50 | 40 | 2.0 | 101028 (balanced)<br>100182 (balanced) |

**Progression requirements:** Requires 120 credits at Level 5
**Exit qualification:** Dip HE Mechatronics and Robotics (requires 120 credits at Level 4 and 120 credits at Level 5)

**Year 3/Level P - Optional placement year in industry/business**
The optional sandwich placement is taken between levels 5 and 6.

**Progression requirements:** Satisfactory completion of a minimum 30-week placement in industry/business. Students who do not choose to undertake the optional sandwich placement may progress directly from Level 5 to Level 6.

**Year 3or4/Level 6**
Students are required to complete all 5 core units.

| Unit Name | Core/ Option | No of credits | Assessment Element Weightings | | | Expected contact hours per unit | Unit version no. . | HECoS Code (plus balanced or major/minor load) |
|---|---|---|---|---|---|---|---|---|
| | | | Exam 1 | Cwk 1 | Cwk 2 | | | |
| Engineering Project | Core | 40 | | 80 | 20 | 24 | 3.0 | 100190 |
| Mechatronics | Core | 20 | | 40 | 60 | 50 | 1.0 | 100170 |
| Innovation and Professional Practice | Core | 20 | 30 | 70 | | 40 | 1.0 | 100078 (balanced)<br>100814 (balanced) |
| Computational Engineering | Core | 20 | | 100 | | 40 | 3.0 | 100160 |
| Advanced Robotics | Core | 20 | | 100 | | 40 | 1.0 | 100170 |

**Exit qualification:** BEng (Hons) Mechatronics and Robotics
**Sandwich UG award:** Requires 120 credits at Level 4, 120 credits at Level 5, 120 credits at Level 6 and successful completion of a placement year.
**Full-time UG award:** Requires 120 credits at Level 4, 120 credits at Level 5 and 120 credits at Level 6.

## AIMS OF THE DOCUMENT

The aims of this document are to:

- define the structure of the programme;
- specify the programme award titles;
- identify programme and level learning outcomes;
- articulate the regulations governing the awards defined within the document.

## AIMS OF THE PROGRAMME

This programme aims to develop creative, innovative and resourceful graduates, who:

- have a set of modern professional mechatronics and robotic skills informed by research and industry.
- have the ability and confidence to apply their knowledge and skills to specific mechatronics and robotics problems individually or in a group, and also communicate effectively with both those working in the general field of engineering and with the wider public.
- have a broad understanding of business and management processes, security risks, and the application of business law and intellectual property.
- have knowledge and understanding of a wide range of modern materials, technologies and processes.
- have the ability to apply appropriate science, mathematics and engineering tools for solving complex problems in mechatronics and robotics, and the ability to assess the limitations of particular cases.
- Recognise that the impacts of their decisions may be global and long-lasting and are able to apply the principles of ethics as well as sustainability through the UNSD Goals.
- Are equipped to work with stakeholders and social and cultural structures, both within and outside of their normal community of practice, recognising the benefits and importance of equality, diversity and inclusion. that the impacts of their decisions may be global and long-lasting.

The BEng (Hons) Mechatronics and Robotics programme integrates the study of scientific and engineering principles of mechanical systems, electronics and intelligent computer-based control with business and management skills to produce graduates who will contribute to developing and advancing the mechatronics and robotics field.

An integrated approach is used to develop the understanding and the application of concepts through projects. Theoretical, experimental and computational methods are introduced and compared to understand the limitations of each.

Engineering design is heavily integrated into the programme. A number of projects incorporate a build element to integrate Engineering Practice. Advanced modelling and simulation techniques are utilised to shorten design time and reduce market entry costs. The guidance for the projects reduce through the programmes and the students are required to fully research the problem as well as developing the design culminating in their final project.

The programme seeks to develop global citizens who understand how the world works economically, politically, socially, culturally, technologically and environmentally. They will be able to balance the demands of industry against ethical practice and social and environmental impacts identified in the UNSD Goals. Students will develop team-working skills and understand the importance and benefit of equality, diversity and inclusion.

Sustainability has been heavily built into the curriculum and is embedded in a number of projects. This is informed by the research conducted by the BU Sustainable Design Research cluster.

Engineering practice is integrated throughout the programmes through workshops and laboratories to gain a practical understanding of the theory. In year one students are given an introduction to workshop practice which develops through the programme to include CAD/CAM and Rapid Manufacturing.

Students apply experimental mechanics techniques to validate engineering designs, engage in electronic design and manufacture, and integrate to mechatronic and robotic solutions.

## ALIGNMENT WITH THE UNIVERSITY'S STRATEGIC PLAN

The BEng (Hons) Mechatronics and Robotics programme is informed by and aligned with Bournemouth University's 2025 strategic plan and the fusion of excellent teaching, world-class research and professional practice that is at the heart of the institution's visions and values. Students are supported by academics with a wealth of industry experience, many of whom are actively engaged with national professional engineering institutions. Academics delivering the programme are actively engaged in cutting edge research and consultancy projects, while students are encouraged to participate in a range of co-creation and co-publication projects. The programme's innovative pedagogic approach offers students the opportunity to learn by engaging in a series of practical, industry focused projects. These projects are aimed at equipping students with the full range of skills necessary to succeed in an innovative engineering environment, and are informed by the academic team's own industrial experience as well as by a network of industry contacts, who may also contribute directly to the programme by delivering guest lectures and providing opportunities for industrial visits.

## LEARNING HOURS AND ASSESSMENT

Bournemouth University taught programmes are composed of units of study, which are assigned a credit value indicating the amount of learning undertaken. The minimum credit value of a unit is normally 20 credits, above which credit values normally increase at 20-point intervals. 20 credits is the equivalent of 200 study hours required of the student, including lectures, seminars, assessment and independent study. 20 University credits are equivalent to 10 European Credit Transfer System (ECTS) credits.

The assessment workload for a unit should consider the total time devoted to study, including the assessment workload (i.e. formative and summative assessment) and the taught elements and independent study workload (i.e. lectures, seminars, preparatory work, practical activities, reading, critical reflection).

Assessment per 20 credit unit should normally consist of 3,000 words or equivalent. Dissertations and Level 6 and 7 Final Projects are distinct from other assessment types. The word count for these assignments is 5,000 words per 20 credits, recognising that undertaking an in-depth piece of original research as the capstone to a degree is pedagogically sound.

## STAFF DELIVERING THE PROGRAMME

Students will usually be taught by a combination of senior academic staff with others who have relevant expertise including – where appropriate according to the content of the unit – academic staff, qualified professional engineers, demonstrators/technicians and research students.

## INTENDED LEARNING OUTCOMES – AND HOW THE PROGRAMME ENABLES STUDENTS TO ACHIEVE AND DEMONSTRATE THE INTENDED LEARNING OUTCOMES

## PROGRAMME INTENDED OUTCOMES

<table>
<tr><td>A: Knowledge and understanding<br><br>This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:</td></tr>
<tr><td rowspan="2">A1 modern mechatronics and robotics technologies and processes for potential application in industry at a professional engineer level;<br><br>A2 a range of mechatronics, robotics and related engineering theories and concepts to analyse and solve complex problems;<br><br>A3 the appropriate analytical and/or computer tools for efficiently and effectively predicting and optimising complex problems;<br><br>A4 the planning, implementation and presentation of an individual project;<br><br>A5 the business environment and management processes including security risk to operations and assets, and intellectual property rights;<br><br>A6 the importance and benefit of equality, diversity and inclusion, as well as being able to balance the demands of industry against social and environmental impacts identified in the UNSD Goals.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• independent research (for project) (A1-A6);<br>• lectures (A1-A6);<br>• seminars (A1–A6);<br>• practical tutorials (A2, A3);<br>• directed reading (A1, A2, A4, A5);<br>• use of the VLE (A1-A6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• individual project (A1-A5);<br>• examinations (A6);<br>• coursework (A1–A6).</td></tr>
<tr><td>B: Intellectual skills<br><br>This programme provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:</td></tr>
<tr><td rowspan="2">B1 approach and implement mechatronics and robotics in a methodical and disciplined manner;<br><br>B2 evaluate and synthesise information from a number of sources in order to gain a coherent understanding of mechatronics and robotics theory and practice;<br><br>B3 evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to complex mechatronics and robotics problems;<br><br>B4 plan and implement mechatronics and robotics design projects individually and in a group;<br><br>B5 demonstrate a level and type of education to allow the pursuit of postgraduate research in a related discipline;</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• independent research (for project) (B1- B6);<br>• group exercises (B2, B4);<br>• practical tutorials (B3, B4, B6);<br>• directed reading (B2, B6);<br>• use of the VLE (B1-B6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• individual project (B1-B6);<br>• Examinations (B2, B5);<br>• coursework (B1–B6).</td></tr>
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<tr><td>B6 critically evaluate modern mechatronics and robotics technologies research and future trends.</td><td></td></tr>
<tr><td>C: Practical skills<br><br>This programme provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:</td></tr>
<tr><td rowspan="2">C1 identify, understand and employ the appropriate analytical models to solve complex mechatronics and robotics design problems;<br><br>C2 use highly specialised manual and/or computer-based methods for engineering communication and presentation;<br><br>C3 be able to employ efficiently advanced modelling, simulation and analysis packages in mechatronics and robotics design;<br><br>C4 critically review and select engineering materials and material processing methods for the design of components;<br><br>C5 select and use basic workshop-based material processing tools and machines, safely and effectively;<br><br>C6 identify and safely use appropriate laboratory methods;<br><br>C7 use modern engineering technologies and tools to establish mechatronics and robotics solutions and adapt engineering designs.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• individual project (C1-C7);<br>• practical tutorials (C2, C3, C5, C6, C7);<br>• seminars (C1, C4);<br>• use of the VLE (C1-C7).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• individual project (C1-C7);<br>• coursework (C1–C7).</td></tr>
<tr><td>D: Transferable skills<br><br>This programme provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:</td></tr>
<tr><td rowspan="2">D1 communicate effectively and confidently by oral, written and visual means to technical and non-technical audiences;<br><br>D2 work effectively in collaboration with others, including staff and students;<br><br>D3 demonstrate creativity in problem solving and the application of knowledge across discipline areas;<br><br>D4 identify and work towards targets for personal, career, and academic development<br><br>D5 be independent and reflective learners;<br><br>D6 use IT including the Web, spreadsheets, presentation and word processing;<br><br>D7 solve numerical and statistical problems using appropriate techniques.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (D1);<br>• individual project (D1, D3-D7);<br>• practical tutorials (D3, D6, D7);<br>• seminars (D1, D2, D3, D5);<br>• group exercises (D1, D2, D6);<br>• use of the VLE (D1 – D7).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• individual projects (D1, D3-D7);<br>• examination (D7);<br>• coursework (D1–D7).</td></tr>
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## LEVEL 5/DipHE INTENDED LEVEL OUTCOMES

<table>
<tr><td>A: Knowledge and understanding<br><br>This level provides opportunities for students to develop and demonstrate knowledge and understanding of:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 an increased range of mechatronics and robotics principles and processes;<br><br>A2 analytical tools to apply them to engineering design and technological problems at a professional mechatronics and robotics level;<br><br>A3 the physical and analytical principles required to achieve solutions to a range of standard and non-standard mechatronics and robotics problems;<br><br>A4 management issues relating to engineering and design businesses including security risk to operations and assets, and intellectual property rights;<br><br>A5 appropriate mathematical methods to solve engineering problems.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (A1- A5);<br>• seminars (A1 – A5);<br>• directed reading (A1-A5);<br>• use of the VLE (A1-A5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• Examinations and in-class tests (A1, A3, A5);<br>• coursework (A1 – A5).</td></tr>
<tr><td>B: Intellectual skills<br><br>This level provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td rowspan="2">B1 approach and implement mechatronics and robotics in a methodical and disciplined manner;<br><br>B2 identify and evaluate information from a number of sources in order to gain a coherent understanding of mechatronics and robotics theory and practice;<br><br>B3 evaluate and apply scientific knowledge and skills in the development and implementation of practical solutions to mechatronics and robotics problems;<br><br>B4 plan and implement solutions to mechatronics and robotics design problems individually and in a group.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (B1 - B4);<br>• seminars (B1 – B4);<br>• directed reading (B1 – B4);<br>• use of the VLE (B1 – B4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• Examinations and in-class tests (B1,B2);<br>• coursework (B1 – B4).</td></tr>
<tr><td>C: Practical skills<br><br>This level provides opportunities for students to:</td><td>The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td>C1 identify, understand and employ the appropriate mathematical models to solve mechatronics and robotics design problems;</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</td></tr>
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|---|---|
| **C2** use highly specialised manual and/or computer-based methods for engineering communication and presentation;<br><br>**C3** be able to employ efficiently advanced modelling, simulation and analysis packages in mechatronics and robotics design;<br><br>**C4** review and select engineering materials and material processing methods for the design of components;<br><br>**C5** use basic workshop-based material processing tools and machines, safely and effectively;<br><br>**C6** safely use appropriate laboratory methods;<br><br>**C7** collect, analyse, evaluate, present and use research information. | • lectures (C1 - C3, C6);<br>• coursework (C1 – C7);<br>• practical exercises (C1 – C7);<br>• group exercises (C1-C4).<br><br>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• examinations and in-class tests (C1, C4);<br>• coursework (C1-C7). |
| **D: Transferable skills**<br><br>This level provides opportunities for students to: | The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes: |
| **D1** communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards;<br><br>**D2** work effectively in collaboration with others, including staff and students;<br><br>**D3** demonstrate an enhanced ability in problem solving and the application of knowledge across discipline areas;<br><br>**D4** identify and work towards targets for personal, career, and academic development;<br><br>**D5** be independent and reflective learners;<br><br>**D6** use IT including the Web, spreadsheets, presentation and word processing;<br><br>**D7** solve numerical and statistical problems using appropriate techniques. | Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (D1 – D7);<br>• seminars (D1- D7);<br>• use of the VLE (D1 – D7);<br>• directed reading (D1- D7).<br><br>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• coursework (D1 – D7);<br>• examinations and in-class tests (D1, D3, D5);<br>• practical exercises (D1, D3, D6). |

## LEVEL 4/Cert HE INTENDED LEVEL OUTCOMES

| | |
|---|---|
| **A: Knowledge and understanding**<br><br>This level provides opportunities for students to develop and demonstrate knowledge and understanding of*:* | The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes: |
| **A1** a range of mechatronics and robotics principles and processes;<br><br>**A2** analytical tools to gain confidence in applying them to mechatronics and robotics design and technological problems at a professional mechanical engineer level; | Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (A1- A3);<br>• seminars (A1 – A3);<br>• directed reading (A1-A3);<br>• use of the VLE (A1-A3). |

| | |
|---|---|
| **A3** mathematical fundamentals, models and processes and their application to a range of mechatronics and robotics principles and processes. | Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• examinations and in-class tests (A1-A3);<br>• coursework essays (A1 – A3);<br>• practical exercises (A1). |
| **B: Intellectual skills**<br><br>This level provides opportunities for students to: | The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes: |
| **B1** approach and implement mechatronics and robotics in a methodical and disciplined manner;<br><br>**B2** review and use information from a number of sources in order to gain a coherent understanding of mechatronics and robotics theory and practice;<br><br>**B3** evaluate and apply basic scientific knowledge and skills in the development and implementation of practical solutions to mechatronics and robotics problems. | Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (B1, B2);<br>• seminars (B1 – B3);<br>• directed reading (B1 – B3);<br>• use of the VLE (B1 – B3). |
| | Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• examinations and in-class tests (B1, B2);<br>• coursework (B1 – B3);<br>• practical exercises (B3). |
| **C: Practical skills**<br><br>This level provides opportunities for students to: | The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes: |
| **C1** understand and employ appropriate analytical models to solve mechatronics and robotics design problems;<br><br>**C2** use highly specialised manual and/or computer-based methods for engineering communication and presentation;<br><br>**C3** review and select engineering materials and material processing methods for the design of components;<br><br>**C4** use basic workshop-based material processing tools and machines, safely and effectively;<br><br>**C5** use basic electrical and electronic components, safely and effectively;<br><br>**C6** safely use appropriate laboratory methods. | Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (C1 – C6);<br>• coursework (C1 – C6);<br>• practical exercises (C1 – C6);<br>• group exercises (C1-C6). |
| | Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• examinations and in-class tests (C1, C3);<br>• coursework (C1- C6);<br>• practical exercises (C1- C6). |
| **D: Transferable skills** | The following learning and teaching and assessment strategies and methods |

<table>
<tr><td>This level provides opportunities for students to:</td><td>enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards;<br><br>D2 work effectively in collaboration with others, including staff and students;<br><br>D3 demonstrate ability in problem solving and the application of knowledge across discipline areas;<br><br>D4 identify and work towards targets for personal, career, and academic development;<br><br>D5 develop reflection in learning;<br><br>D6 use IT including the Web, spreadsheets, presentation and word processing;<br><br>D7 solve numerical and statistical problems using appropriate techniques.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• lectures (D1 – D6);<br>• seminars (D1- D7);<br>• use of the VLE (D1 – D7);<br>• directed reading (D1- D7).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):<br><br>• coursework (D1 – D7);<br>• examinations and in-class tests (D1, D3, D7);<br>• practical exercises (D1- D7).</td></tr>
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## ADMISSION REGULATIONS

The regulations for this programme are the University's Standard Undergraduate Admission Regulations with the following exceptions:

Entry to Level 4
Applicants will require A-Level Mathematics and any Science or Technology subject or equivalent.

Entry to Level 5
Applicants to level 5 for the BEng programme Mechatronics and Robotics require:

- an HNC Engineering at Bournemouth and Poole College with Merit

or

- an HNC with Merit in an engineering discipline accredited to EngTech

Entry to Level 6
Students who have successfully completed the FdEng Engineering (Mechanical Design) programme at Bournemouth and Poole with a minimum classification of Merit will be eligible to apply for entry with advanced standing to the Level 6 of the BEng (Hons) Mechatronics and Robotics programme at Bournemouth University and credited with 120 credits at Level 4 and 120 credits at Level 5.

Additionally, other applicants to level 6 for the BEng programme Mechatronics and Robotics require a FdSc, FdEng or HND with Merit in an engineering discipline accredited to EngTech, partial IEng or IEng.

Transfer from MEng to BEng (Hons) Mechatronics and Robotics
Students can request to transfer from MEng (Hons) Mechatronics and Robotics to BEng (Hons) Mechatronics and Robotics, at any point during the programme. Each transfer will be considered on a case by case basis.

## PROGRESSION ROUTES

Partnership arrangements provide formally approved progression routes through which students are eligible to apply for a place on a programme leading to a BU award. Please find information on

International Partnerships here: https://www.bournemouth.ac.uk/collaborate/global-bu/international-partnerships

## ASSESSMENT REGULATIONS

The regulations for this programme are the University's Standard Undergraduate Assessment Regulations (6A) with the following approved exceptions to clauses 7.1 and 7.2 which align the programme with the requirements of The Engineering Council, Accreditation of Higher Education Programmes (AHEP):

**COMPENSATION**
Compensation may only be applied for up to 20 credits across all levels of the programme and cannot be applied to individual or group project units.

## PLACEMENT ELEMENT

This programme offers students, under the guidance of the Placement Tutor and the Placement Coordinator, the opportunity to complete a sandwich year with a minimum 30-week placement before level 6.

Successful completion of the 30-week placement is optional. The placement is assessed on a pass/fail basis using a 3,000-word reflective report. The 30-week sandwich placement must be completed between levels 5 and 6 and is a requirement for progression to level 6 for the successful completion of the sandwich mode award.

Placement draws on some or all of the units studied on the first two levels of the programme. It provides the opportunity for the student to develop their abilities and understanding of mechanical engineering and related subjects, as well as providing a platform for successful entry into the profession following graduation. It applies and develops understanding and skills acquired in Levels 4 and 5, makes a major contribution to the understanding of the final level units, further develops final projects by utilising the context of the work experience as appropriate and enhances students' prospects of future employment.

http://intranetsp.bournemouth.ac.uk/pandptest/4k-placements-policy-and-procedure.pdf

## Programme Skills Matrix

| | Programme Intended Learning Outcomes<br>Unit | A 1 | A 2 | A 3 | A 4 | A 5 | A 6 | B 1 | B 2 | B 3 | B 4 | B 5 | B 6 | C 1 | C 2 | C 3 | C 4 | C 5 | C 6 | C 7 | D 1 | D 2 | D 3 | D 4 | D 5 | D 6 | D 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L6** | Mechatronics (20) | x | x | x | | | | x | x | x | | x | x | x | | x | x | | x | x | x | x | x | | x | x | x |
| **L6** | Computational Engineering (20) | x | x | x | | | | x | | x | | x | | x | x | x | x | | | | x | | x | | x | x | x |
| **L6** | Engineering Project (40) | X | x | X | X | X | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| **L6** | Innovation and Professional Practice (20) | | | | | X | x | | | | | x | | | | | | | | | x | x | x | x | x | x | |
| **L6** | Advanced Robotics (20) | x | x | x | | | | x | x | x | | x | | x | | x | x | | x | | x | | x | | | x | x |
| **L5** | Robotic Digital Control (20) | x | x | x | | | | x | x | x | | | | x | x | x | x | | x | x | x | x | | | | | |
| **L5** | Management and Commercialisation (20) | | | | | x | x | | | | | | | | | | | | | | x | x | x | | | | |
| **L5** | Engineering Simulation (20) | x | x | x | | | | x | x | x | | | | x | x | x | | | x | x | x | | x | | | x | x |
| **L5** | Engineering Mathematics for Mechanical Systems Design (20) | x | x | x | x | | | x | x | x | x | | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| **L5** | Stress and Dynamics (20) | x | x | x | | | | x | | x | | | | x | | | x | | x | | x | | x | | | | x |
| **L5** | Engineering Design Tools (20) | x | x | x | | | | x | x | | | | | x | x | | x | | x | x | x | | x | | | x | x |
| **L4** | Engineering Mathematics (20) | x | | x | | | | x | x | | | | | x | | | | | | | x | x | | | | | x |
| **L4** | Electrical and Electronic Principles (20) | x | x | x | | | | x | x | | | | | x | | x | | | x | | x | x | | | | x | x |
| **L4** | Engineering Design with Practice (20) | x | x | x | x | | | x | x | x | x | | | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| **L4** | Engineering Principles A (20) | x | x | x | | | | x | x | | | | | x | | x | | | x | | x | x | | | | x | x |
| **L4** | Materials with Practice (20) | x | x | x | | | | x | x | | | | | | | x | x | x | x | | x | x | | x | | x | x |
| **L4** | Mechatronics and Robotics Principles (20) | x | x | x | | | | x | x | | x | | | x | | x | | | x | | x | x | x | | | x | x |

## PSRB Output Standard Matrix

This course has been developed to meet in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) and students will need to complete an approved format of further learning pursuant to the requirements of UK-SPEC. See the Engineering Council UK website (https://www.engc.org.uk/ahep) for more information on the learning outcomes..

| EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ceng Rq FL | | AHEP4 Level >> | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 4 |
| Programme Title: | Beng (Hons) Mechatronics and Robotics | | | | | | | | | | | | | | | | | | | |
| | Module code | Compulsory | Science and Maths | Engineering Analysis | | | Design and Innovation | | The Engineer and Society | | | | | Engineering Practice | | | | | | |
| | | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 | C17 | C18 |
| Total Count | 86 | | 10 | 10 | 10 | 8 | 1 | 7 | 1 | 4 | 4 | 4 | 1 | 8 | 6 | 1 | 3 | 4 | 3 | 1 |
| Core Count | 86 | | 10 | 10 | 10 | 8 | 1 | 7 | 1 | 4 | 4 | 4 | 1 | 8 | 6 | 1 | 3 | 4 | 3 | 1 |
| Year 1 | *Eng Design w Practice* | x | | | | x | | x | | | | | | x | x | | | x | x | |
| | *Eng Mathematics* | x | x | x | | | | | | | | | | | | | | | | |
| | *Eng Principles A* | x | x | x | | | | | | | | | | x | | | | | | |
| | *Mechatronics & Robotics Principles* | x | x | | | | | x | | x | | | | x | | | | | | |
| | *Elec & Electronic Principles* | x | | | x | x | | | | | | | | x | x | | | | | |
| | *Materials w Practice* | x | | | | | | | | | | x | | x | x | | | | | |
| Year 2 | *Eng Math for Mech Systems Design* | x | x | x | x | x | | x | | | | | | | | | | x | x | |
| | *Eng Simulation* | x | x | x | x | | | x | | | | | | | | | | | | |
| | *Robotic Digital Control* | x | | | x | x | | x | | | | | | | | | | | | |
| | *Management & Commercialisation* | x | | | | | | | | | x | x | | | | | x | x | | |
| | *Engineering Design Tools* | x | x | x | x | x | | | | | | | | x | x | | | | | |
| | *Stress and Dynamics* | x | x | x | x | | | | | | | | | | | | | | | |
| Year 3 | *Mechatronics* | x | | x | x | x | | x | | | | | | x | x | | | x | | |
| | *Computational Engineering* | x | x | x | x | x | | x | | | | | | | | | | | | |
| | *Innovation and Professional Practice* | x | | | | | | | | x | x | | x | | | x | x | | | |
| | *Engineering Project* | x | x | x | x | x | x | | x | x | x | x | | | x | | x | | x | x |
| | *Advanced Robotics* | x | x | x | x | | | | | x | x | x | | x | | | | | | |