KEY PROGRAMME INFORMATION

Originating institution(s) Bournemouth University	**Faculty responsible for the programme** Faculty of Science and Technology
Final award(s), title(s) and credits MSc Mechanical Engineering –180 (90 ECTS) Level 7 credits	
Intermediate award(s), title(s) and credits PGDip Mechanical Engineering - 120 (60 ECTS) Level 7 credits PGCert Mechanical Engineering - 60 (30 ECTS) Level 7 credits	
UCAS Programme Code(s) (where applicable and if known) NA	**HECoS (Higher Education Classification of Subjects) Code and balanced or major/minor load** 100190 (balanced), 100182 (balanced)
External reference points UK Quality Code for Higher Education; Part A: Setting and Maintaining Academic Standards; 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; Subject benchmark statements - Engineering (2023); 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 Accreditation will be sought from the Institution of Engineering Designers (IED) and the Institution of Mechanical Engineers (IMechE) to meet, in full, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) in 2025.	
Places of delivery Bournemouth University, Talbot Campus	
Mode(s) of delivery full-time/part-time	**Language of delivery** English
Typical duration Programme duration: 15 months full-time (September intake) / 18 months full-time (January intake) 27 months part-time (September intake) / 30 months full-time (January intake)	
Date of first intake September 2025	**Expected start dates** September and January
Maximum student numbers Not applicable	**Placements** Not applicable
Partner(s) Not applicable	**Partnership model** Not applicable
Date of this Programme Specification June 2024	
Version number v1.0-0925	
Approval, review or modification reference numbers E232435	
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PROGRAMME STRUCTURE

Programme Award and Title: MSc Mechanical Engineering

Stage 1/Level 7
Students are required to complete 6 core units.

Unit Name	Core/ Option	No of credits	Assessment Element Weightings			Expected contact hours per unit	Unit version no.	HECoS Subject Code
			Exam 1	Cwk 1	Cwk 2			
Advanced Structural Mechanics	Core	20	70	30		26	1.0	100190
Failure Analysis and Prevention	Core	20	70	30		26	4.0	100190
Interdisciplinary Group Project	Core	20		100		26	3.0	100182
Model Based Engineering	Core	20		100		26	1.0	100182
Life Cycle Management	Core	20		100		26	2.0	100048 (balanced) 100180 (balanced)
Robotic Control Design	Core	20		100		26	2.0	100170 (major) 100163 (minor)

Progression requirements: Requires 120 credits at Level 7

Exit qualification:
PGCert Mechanical Engineering requires 60 credits at Level 7. Student must pass two subject specific units (from Advanced Structural Mechanics, Failure Analysis and Prevention, Model Based Engineering or Life Cycle Management)
PgDip Mechanical Engineering requires 120 credits at Level 7. Students must pass all taught units excluding the individual project.

Stage 2/Level 7
Students are required to complete the Individual Project.

Unit Name	Core/ Option	No of credits	Assessment Element Weightings			Expected contact hours per unit	Unit version no.	HECoS Subject Code
			Exam 1	Cwk 1	Cwk 2			
Individual Engineering Masters Project	Core	60		90	10	10 (excluding supervision)	3.0	100190 (balanced) 100182 (balanced)

Exit qualification: MSc Mechanical Engineering requires 180 credits at Level 7.

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 the ability and confidence to apply their knowledge and skills to a specific engineering design problem through a planned and executed individual project, communicating the outcomes effectively with both those working in the field of design engineering and with the wider public;
- have knowledge of advanced robotic control systems, their applications, and an ability to apply to solve engineering design problems.
- have comprehensive knowledge and understanding of a wide range of material and structural failure theories;
- have comprehensive knowledge and understanding of a wide range of existing and emerging theories, technologies and processes and demonstrate professional competence and critical awareness when selecting and applying them for design and analysis.
- 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.

MSc Mechanical Engineering is a course for graduate engineers and design engineers who wish to enhance their skills/knowledge/experience in mechanical engineering and engineering design and gain the internationally recognised tile of Chartered Engineer (CEng) but do not currently meet the academic requirements. It is generally accepted that professionals holding CEng status benefit from significantly improved careers prospects than their peers.

The masters programme broadens and deepens the students' knowledge, understanding, skills and awareness from the bachelor's degree. Broadening is obtained through the Life Cycle Management and Robotic Control Design units, while deepening is obtained through the Advanced Structural Mechanics, Failure Analysis and Prevention and Model Based Engineering units. Students apply the knowledge, understanding and skills gained in the taught units in solving complex and unfamiliar problems through the interdisciplinary group 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.

The course is primarily targeted at engineering graduates holding a BSc or BEng honours degree accredited as partially meeting the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng). Applicants may be recently qualified graduates or those who completed their degrees some time ago.

ALIGNMENT WITH THE UNIVERSITY'S STRATEGIC PLAN

The MSc Mechanical Engineering 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.

As a general rule, time devoted to assessment should normally represent approximately 25% of the student learning time for a unit (i.e. 50 hours for a 20-credit unit), leaving the rest for specific programme-related activities, including lectures, seminars, preparatory work, practical activities, reading, critical reflection and independent learning.

Of the time devoted to assessment, every 10 hours of student effort is equivalent to approximately 1,000 words of coursework or 1 hour of examination. Therefore, as a guideline, a 20-credit unit would normally require the equivalent of approximately 5,000 words in total (e.g. a 2,000-word written coursework and a 3-hour unseen examination).

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 practitioners, 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: Subject knowledge and understanding

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 advanced methodologies for digital workflow of engineering specification and control through model based engineering;

A2 theory underpinning the control of robotic systems;

A3 selection and application of different techniques used in the management of projects, with particular emphasis on the ethics, equality, diversity and inclusion of project teams;

A4 methodology, research planning, and experiment design and analysis techniques;

A5 a range of structural integrity theories and the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load;

A6 the social, economic and environmental impact of decision making throughout the product lifecycle. life cycle assessment and influencing sustainable development within the design process.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• independent research (for project) (A1-A6);
• lectures (A1-A6);
• seminars (A1–A6);
• practical tutorials (A1, A2, A5, A6);
• directed reading (A3, A4);
• use of the VLE (A1-A6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual project (A1-A6);
• coursework (A1–A6);
• Examinations (A5).</td></tr>
<tr><td>B: Intellectual skills

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 outcomes:</td></tr>
<tr><td rowspan="2">B1 develop strategies for identifying and balancing system specifications efficiently across optimised components;

B2 formulate, plan, execute and report on a project involving original engineering design in a structured and disciplined manner;

B3 critically reflect upon interpersonal skills required to operate in a team environment as a professional design engineer;

B4 develop a high level of ability to analyse, evaluate and critically appraise a range of engineering problems to formulate a solution strategy;

B5 quantify the environmental impact of a product/system through Life Cycle Analysis techniques;

B6 identify appropriate sources of information and evaluate them critically in terms of reliability and relevance to a particular topic;</td><td>Learning and teaching strategies and methods:

• independent research (for project) (B1- B7);
• group exercises (B3, B5);
• practical tutorials (B5);
• use of the VLE (B1-B7).</td></tr>
<tr><td>Assessment strategies and methods:

• individual project (B1-B7);
• coursework (B1–B7).</td></tr>
</table>

B7 deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data.	
C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
C1 apply and critically evaluate various management techniques to ensure efficient operation of a team; **C2** diagnose the causes of the different types of service failure and the ability to propose methods of avoiding them in future; **C3** independently select and apply theoretical, computational and analytical techniques to solve a range of complex engineering problems. **C4** be able to apply typical product/service lifecycle scenarios to a project at the initial concept stage.	Learning and teaching strategies and methods: • individual project (C1-C4); • practical tutorials (C1-C4); • seminars (C1 –C4); • use of the VLE (C1-C4). Assessment strategies and methods: • individual project (C1-C4); • coursework (C1–C4).
D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D1 demonstrate problem solving skills and the application of knowledge across the discipline areas; **D2** gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media; **D3** distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere; **D4** demonstrate initiative, self-direction and exercise personal responsibility for management of own learning; **D5** work autonomously and become reflective learners; **D6** communicate effectively and confidently to appropriate professional and academic standards.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1-D3); • individual project (D1-D6); • seminars (D1-D6); • use of the VLE (D1 – D6). Assessment strategies and methods: • individual projects (D1-D6); • coursework (D1–D6).

PGDip INTENDED OUTCOMES

A: Subject knowledge and understanding This programme 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 programme learning outcomes:
A1 the state-of-the-art materials technologies and industrial demands for continued development of new structural materials of high performance;	Learning and teaching strategies and methods: • lectures (A1-A6);

A2 theory underpinning the control of robotic systems; **A3** selection and application of different techniques used in the management and control of projects, with special emphasis on project teams; **A4** methodology, research planning, and experiment design and analysis techniques; **A5** a range of structural integrity theories and the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load; **A6** the social, economic and environmental impact of decision making throughout the product lifecycle. life cycle assessment and influencing sustainable development within the design process.	• seminars (A1–A6); • practical tutorials (A1, A2, A5, A6); • directed reading (A3, A4); • use of the VLE (A1-A6). Assessment strategies and methods: • coursework (A1–A6).
B: Intellectual skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme outcomes:
B1 develop strategies for identifying and balancing system specifications efficiently across optimised components; **B2** critically reflect upon interpersonal skills required to operate in a team environment as a professional design engineer; **B3** develop a high level of ability to analyse, evaluate and critically appraise a range of engineering problems to formulate a solution strategy; **B4** quantify the environmental impact of a product/system through Life Cycle Analysis techniques; **B5** identify appropriate sources of information and evaluate them critically in terms of reliability and relevance to a particular topic.	Learning and teaching strategies and methods: • group exercises (B2, B4); • practical tutorials (B4); • use of the VLE (B1-B5). Assessment strategies and methods: • coursework (B1–B5).
C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
C1 apply and critically evaluate various management techniques to ensure efficient operation of a team; **C2** diagnose the causes of the different types of service failure and the ability to propose methods of avoiding them in future; **C3** independently select and apply theoretical, computational and analytical techniques to solve a range of complex engineering problems. **C4** be able to apply typical product/service lifecycle scenarios to a project at the initial concept stage.	Learning and teaching strategies and methods: • practical tutorials (C1-C4); • seminars (C1 –C4); • use of the VLE (C1-C4). Assessment strategies and methods: • coursework (C1–C4).

D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D1 demonstrate problem solving skills and the application of knowledge across the discipline areas; **D2** gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media; **D3** distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere; **D4** demonstrate initiative, self-direction and exercise personal responsibility for management of own learning; **D5** work autonomously and become reflective learners; **D6** communicate effectively and confidently to appropriate professional and academic standards.	Learning and teaching strategies and methods: • lectures (D1-D3); • seminars (D1-D6); • use of the VLE (D1 – D6). Assessment strategies and methods: • coursework (D1–D6).

PGCert INTENDED OUTCOMES

A: Subject knowledge and understanding This programme 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 programme learning outcomes:
A1 the state-of-the-art materials technologies and industrial demands for continued development of new structural materials of high performance; **A2** a range of structural integrity theories; **A3** the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load; **A4** life cycle assessment and influencing sustainable development within the design process.	Learning and teaching strategies and methods: • lectures (A1-A4); • seminars (A1–A4); • practical tutorials (A1-A4); • use of the VLE (A1-A4). Assessment strategies and methods: • coursework (A1–A4).
B: Intellectual skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme outcomes:
B1 recognise the key changes that happen in a material's properties as its size is reduced to the nanoscale; **B2** develop a high level of ability to analyse, evaluate and critically appraise a range of engineering problems to formulate a solution strategy; **B3** quantify the environmental impact of a product/system through Life Cycle Analysis techniques;	Learning and teaching strategies and methods: • group exercises (B3); • practical tutorials (B3); • use of the VLE (B1-B3). Assessment strategies and methods: • coursework (B1–B3).

C: Practical skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
C1 diagnose the causes of the different types of service failure and the ability to propose methods of avoiding them in future; **C2** independently apply structural integrity theories to solve a range of engineering problems. **C3** be able to apply typical product/service lifecycle scenarios to a project at the initial concept stage.	Learning and teaching strategies and methods: • practical tutorials (C1-C3); • seminars (C1 –C3); • use of the VLE (C1-C3). Assessment strategies and methods: • coursework (C1–C3).
D: Transferable skills This programme provides opportunities for students to:	The following learning and teaching and assessment strategies and methods enable students to achieve and to demonstrate the programme learning outcomes:
D1 demonstrate problem solving skills and the application of knowledge across the discipline areas; **D2** gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media; **D3** distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere; **D4** demonstrate initiative, self-direction and exercise personal responsibility for management of own learning; **D5** work autonomously and become reflective learners; **D6** communicate effectively and confidently to appropriate professional and academic standards.	Learning and teaching strategies and methods: • lectures (D1-D3); • seminars (D1-D6); • use of the VLE (D1 – D6). Assessment strategies and methods: • coursework (D1–D6).

ADMISSION REGULATIONS

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

All applicants to the programme will be interviewed to determine if they are standard or non-standard route applicants. It will be ensured that non-standard route applicants will be made fully aware that they will not be entitled to use the MSc Mechanical Engineering qualification to meet the academic requirements for professional registration.

Additionally, applicants who wish to meet the Engineering Council registration requirements (standard route applicants) for the Masters programme Mechanical Engineering require a degree accredited to partial CEng level.

ASSESSMENT REGULATIONS

The regulations for this programme are the University's Standard Postgraduate 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 (Section 7)

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.

Programme Skills Matrix

	Programme Intended Learning Outcomes Units	A 1	A 2	A 3	A 4	A 5	A 6	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	D 1	D 2	D 3	D 4	D 5	D 6
L7	Robotic Control Design		x								x			x			x		x	x		x	x	x
L7	Model Based Engineering	X						x						x	x		x			x		x	x	x
L7	Life Cycle Management						x				x	x		x				x		x	x	x	x	x
L7	Interdisciplinary Group Project			x					x	x			x	x	x				x	x	x	x	x	x
L7	Failure Analysis and Prevention					x								x		x	x			x		x	x	x
L7	Advanced Structural Mechanics					x								x		x	x			x		x	x	x
L7	Individual Engineering Masters Project	x	x	x	x	x	x	x	x		x	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 full, 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 (http://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 through FL																				
Programme Title:	MSc Mechanical Engineering																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			M1	M2	M3	M4	M5	(no 6)	M7	(no 8)	(no 9)	(no 10)	(no 11)	(no 12)	(no 13)	(no 14)	(no 15)	M16	M17	(no 18)
Total Count	27		4	5	3	6	3		1									1	4	
Core Count	27		4	5	3	6	3		1									1	4	
Year 4-A	*Robotic Control Design*	x	x	x	x	x	x													
	Interdisciplinary Group Project	x											x					x	x	
	Model Based Engineering	x		x	x	x	x	x											x	
	Failure Analysis and Prevention	x	x	x		x														
	Advanced Structural Mechanics	x	x	x		x														
	Lifecycle Management	x			x	x			x										x	
Year 4-B	*Individual Engineering Masters Project*	x	x	x		x	x												x	x