Bournemouth University

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 Design –180 (90 ECTS) Level 7 credits	
Intermediate award(s), title(s) and credits PGDip Mechanical Engineering Design - 120 (60 ECTS) Level 7 credits PGCert Mechanical Engineering Design - 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: Part A: Setting and Maintaining Academic Standards; Chapter A1: UK and European reference points for academic standards (October 2013) - 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 (2015); UK standard for professional Engineering Competence: Engineering Technician, Incorporated Engineer and Chartered Engineer Standard (UK-SPEC) third edition from the Engineering Council UK (January 2014); UK Standard for Professional Engineering Competence: The Accreditation of Higher Education Programmes third edition from the Engineering Council UK (May 2014).	
Professional, Statutory and Regulatory Body (PSRB) links Accredited by the Institution of Engineering Designers and Institution of Mechanical Engineers as meeting the further learning requirement for Chartered Engineer (CEng) registration for the 2019-2023 intake years	
Places of delivery Bournemouth University, Talbot Campus	
Mode(s) of delivery full-time/part-time	**Language of delivery** English
Typical duration Programme duration: 12/15 Months full-time 24 months part-time	
Date of first intake September 2022	**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 December 2022	
Version number Version 2.4-0923	
Approval, review or modification reference numbers E20171859 EC 1819 23 E192033 Previously v1.0-0919 BU 1819 01 Previously v2.0-0919	

FST 2021 01 – Approved 06/11/20 - Previously v2.1-0120 FST 2021 08 - Approved 05/05/2021 - Previously v2.2-0921 FST 2122 16 – Approved 02/02/2022 – Previously v2.3-0922
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PROGRAMME STRUCTURE

Programme Award and Title: MSc Mechanical Engineering Design

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			
Structural Integrity	Core	20	100			31	V3.0	100190
Failure Analysis and Prevention	Core	20		100		31	V3.0	100190
Interdisciplinary Group Project	Core	20		100		31	V2.0	100182
Advanced Materials	Core	20	100			31	V2.0	100225
Life Cycle Management	Core	20		100		31	V1.1	100048 (balanced) 100180 (balanced)
Research Methods	Core	20		100		31	V2.1	100962

Progression requirements: Requires 120 credits at Level 7

Exit qualification:
PGCert Mechanical Engineering Design requires 60 credits at Level 7. Student must pass two subject specific units (from Structural Integrity, Materials Failure and Prevention, Advanced Materials or Life Cycle Management)
PgDip Mechanical Engineering Design 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			
Mechanical Engineering Design Individual Masters Project	Core	60		90	10	7.5	FST V2.1	100190 (balanced) 100182 (balanced)

Exit qualification: MSc Mechanical Engineering Design 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 specific design problems individually or in a group, and also communicate effectively with both those working in the field of design engineering and with the wider public;
- have knowledge of advanced materials, their properties and their applications at the cutting edge of the field.
- have comprehensive knowledge and understanding of a wide range of material and structural failure theories;
- can design for the ecological and environmental needs of people and industry in a sustainable society;
- are fully conversant with contemporary information resources and use them effectively and efficiently.

MSc Mechanical Engineering Design is a course for graduate designers who wish to enhance their skills/knowledge/experience in 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.

Whilst there are a number of ways to achieve academic requirements, it is becoming increasingly common that would-be Chartered Engineers will hold an appropriate Masters degree. The course is primarily targeted at undergraduate engineering graduates. 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 Design programme is informed by and aligned with Bournemouth University's 2012-18 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

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** 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** the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load; **A6** life cycle assessment and influencing sustainable development within the design process.	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). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (A1-A6); • 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 recognise the key changes that happen in a material's properties as its size is reduced to the nanoscale; **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;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (B1- B7); • group exercises (B3, B5); • practical tutorials (B5); • use of the VLE (B1-B7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (B1-B7);

B6 identify appropriate sources of information and evaluate them critically in terms of reliability and relevance to a particular topic; **B7** deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data.	• coursework (B1–B7).
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 apply structural integrity theories to solve a range of 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 (referring to numbered Intended Learning Outcomes): • individual project (C1-C4); • practical tutorials (C1-C4); • seminars (C1 –C4); • use of the VLE (C1-C4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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 (referring to numbered Intended Learning Outcomes): • 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; **A2** a range of structural integrity theories; **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** the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load; **A6** life cycle assessment and influencing sustainable development within the design process.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1-A6); • seminars (A1–A6); • practical tutorials (A1, A2, A5, A6); • directed reading (A3, A4); • use of the VLE (A1-A6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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 recognise the key changes that happen in a material's properties as its size is reduced to the nanoscale; **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 (referring to numbered Intended Learning Outcomes): • group exercises (B2, B4); • practical tutorials (B4); • use of the VLE (B1-B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • practical tutorials (C1-C4);

C2 diagnose the causes of the different types of service failure and the ability to propose methods of avoiding them in future; **C3** independently apply structural integrity theories to solve a range of engineering problems. **C4** be able to apply typical product/service lifecycle scenarios to a project at the initial concept stage.	• seminars (C1 –C4); • use of the VLE (C1-C4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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); • seminars (D1-D6); • use of the VLE (D1 – D6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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 (referring to numbered Intended Learning Outcomes): • lectures (A1-A4); • seminars (A1–A4); • practical tutorials (A1-A4); • use of the VLE (A1-A4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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 (referring to numbered Intended Learning Outcomes): • group exercises (B3); • practical tutorials (B3); • use of the VLE (B1-B3).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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 (referring to numbered Intended Learning Outcomes): • practical tutorials (C1-C3); • seminars (C1 –C3); • use of the VLE (C1-C3).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • 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;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1-D3); • seminars (D1-D6); • use of the VLE (D1 – D6).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

D5 work autonomously and become reflective learners; **D6** communicate effectively and confidently to appropriate professional and academic standards.	• coursework (D1–D6).

ADMISSION REGULATIONS

The regulations for this programme are the University's Standard Postgraduate Admission Regulations (https://intranetsp.bournemouth.ac.uk/pandptest/3a-postgraduate-admissions-regulations.doc) with the following exceptions:

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

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 Design qualification to meet the academic requirements for professional registration.

ASSESSMENT REGULATIONS

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

COMPENSATION (Section 7)
Compensation may only be applied for up to 20 credits at level 7 and cannot be applied to the level 7 group project unit.

Programme Skills Matrix

	Units	Programme Intended Learning Outcomes																							
		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
LEVEL 7	**Research Methods**				x						x		x	x					x	x	x	x	x	x
	Advanced Materials	x						x						x	x					x		x	x	x
	Life Cycle Management						x					x		x				x		x	x	x	x	x
	Interdisciplinary Group Project			x					x	x	x		x	x	x				x	x	x	x	x	x
	Failure Analysis and Prevention					x								x		x	x			x		x	x	x
	Structural Integrity		x			x								x		x	x			x		x	x	x
	Mechanical Design Engineering Individual Masters Project (60 credits)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

A – Subject Knowledge and Understanding

This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:

1. the state-of-the-art materials technologies and industrial demands for continued development of new structural materials of high performance;
2. a range of structural integrity theories;
3. selection and application of different techniques used in the management and control of projects, with special emphasis on project teams;
4. methodology, research planning, and experiment design and analysis techniques;
5. the mechanisms of common static and dynamic failures in metallic, polymeric and ceramic materials, when under load;
6. life cycle assessment and influencing sustainable development within the design process.

B – Intellectual Skills

This programme provides opportunities for students to:

1. recognise the key changes that happen in a material's properties as its size is reduced to the nanoscale;
2. formulate, plan, execute and report on a project involving original engineering design in a structured and disciplined manner;
3. critically reflect upon interpersonal skills required to operate in a team environment as a professional design engineer;
4. develop a high level of ability to analyse, evaluate and critically appraise a range of engineering problems to formulate a solution strategy;
5. quantify the environmental impact of a product/system through Life Cycle Analysis techniques;
6. identify appropriate sources of information and evaluate them critically in terms of reliability and relevance to a particular topic;
7. deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data.

C – Subject-specific/Practical Skills

This programme provides opportunities for students to:

1. apply and critically evaluate various management techniques to ensure efficient operation of a team;
2. diagnose the causes of the different types of service failure and the ability to propose methods of avoiding them in future;
3. independently apply structural integrity theories to solve a range of engineering problems.
4. be able to apply typical product/service lifecycle scenarios to a project at the initial concept stage.

D – Transferable Skills

This programme provides opportunities for students to:

1. demonstrate problem solving skills and the application of knowledge across the discipline areas;
2. gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media;
3. distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere;
4. demonstrate initiative, self-direction and exercise personal responsibility for management of own learning;
5. work autonomously and become reflective learners;
6. communicate effectively and confidently to appropriate professional and academic standards.

MSc Mechanical Engineering Design
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