Bournemouth University

Programme Specification – Section 1

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 MEng (Hons) Mechanical Engineering – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 / 120 (60 ECTS) Level 6 credits / 120 (60 ECTS) Level 7 credits	
Intermediate award(s), title(s) and credits BEng (Hons) Mechanical Engineering – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits / 120 (60 ECTS) Level 6 credits Dip HE Mechanical Engineering – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits Cert HE Mechanical Engineering – 120 (60 ECTS) Level 4 credits	
UCAS Programme Code(s) (where applicable and if known) H105	**HECoS (Higher Education Classification of Subjects) Code and balanced or major/minor load.**100190 (100%)
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 IED: Accredited by the Institution of Engineering Designers to fully meet the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) for 2019-2023 intake years IMechE: Accredited by the Institution of Mechanical Engineers to meet in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) for the 2019 intake year.	
Places of delivery Bournemouth University, Talbot Campus	
Mode(s) of delivery Full-time/Full-time sandwich	**Language of delivery** English
Typical duration Programme duration: 4 years full-time / 5 years full-time sandwich Level 4: 1 year Level 5: 1 year Optional sandwich placement: 1 year Level 6: 1 year Level 7: 1 year	
Date of first intake September 2019	**Expected start dates** September
Maximum student numbers Not applicable	**Placements** 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.

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Partner(s) Not applicable	**Partnership model** Not applicable
Date of this Programme Specification September 2023	
Version number v2.3-0924	
Approval, review or modification reference numbers E20171857 BU 1819 01 EC 1819 23 E192033 – previously v1.1-0919 EC 1920 44 FST 2122 03 Approved 10/11/2021 – previously v2.0-0921 FST 2122 20, approved 23/03/2022, previously v2.1 EC 2122 64, approved 19/07/2022 EC 2223 02 EC 2223 32 FST2324 02, approved 29/09/2023, previously v2.2	
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PROGRAMME STRUCTURE

Programme Award and Title: MEng (Hons) Mechanical Engineering

Year 1/Level 4
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 Subject Code
			Exam 1	Exam 2	Cwk 1	Cwk 2			
Engineering Design with Practice	Core	20			60	40	50	v1.3	100182
Engineering Principles A	Core	20	60		40		50	v1.3	100190
Engineering Principles B	Core	20	60		40		50	v1.3	100190
Materials with Practice	Core	20	60		40		50	v1.4	100203
Electrical and Electronic Principles	Core	20			50	50	50	v2.2	100163
Engineering Mathematics	Core	20	50	50			40	v2.2	101028

Progression requirements: Requires 120 credits at Level 4
Exit qualification: Cert HE Mechanical Engineering (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 Subject Code
			Exam 1	Exam 2	Cwk 1	Cwk 2			
Manufacturing and Engineering Materials	Core	20			100		40	v1.2	100202 (balanced) 100203 (balanced)
Stress and Dynamics	Core	20	50	50			50	v3.2	100190
Engineering Simulation	Core	20			50	50	50	v2.2	100182 (balanced) 100431 (balanced)
Fluids and Thermodynamics	Core	20	100				50	v2.2	100577 (balanced) 100431 (balanced)
Management and Commercialisation	Core	20			100		40	v1.2	101221
Engineering Mathematics for Mechanical Systems Design	Core	20			50	50	40	v1.2	101028 (balanced) 100182 (balanced)

Progression requirements: Requires 120 credits at Level 5
Exit qualification: Dip HE Mechanical Engineering (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 3 or 4/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 Subject Code
			Exam 1	Cwk 1	Cwk 2			
Engineering Project	Core	40		100		24	v2.1	100190
Thermofluids and Energy Conversion	Core	20	100			50	v2.2	100184
Business Development	Core	20		100		36	v2.1	101221
Advanced Stress and Vibration	Core	20	100			50	v2.2	100190
Computational Engineering FT	Core	20		100		40	v2.1	100160

Progression requirements: Requires 120 credits at Level 6
Exit qualification: BEng (Hons) Mechanical Engineering
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.

Year 4 or 5/Level 7
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 Subject Code
			Exam 1	Cwk 1	Cwk 2			
Interdisciplinary Group Project	Core	20		100		31	V2.0	100182
Project Management	Core	20		100		31	v2.1	100812
Major Engineering Team Project	Core	20		100		31	V2.0	100182
Structural Integrity	Core	20	100			31	V3.0	100190
Failure Analysis and Prevention	Core	20	100			31	V3.0	100190
Advanced Materials	Core	20	100			31	V2.0	100225

Exit qualification: MEng (Hons) Mechanical Engineering
Sandwich UG award: Requires 120 credits at Level 4, 120 credits at Level 5, 120 credits at Level 6, 120 credits at Level 7 and successful completion of a placement year.
Full-time UG award: Requires 120 credits at Level 4, 120 credits at Level 5, 120 credits at Level 6 and 120 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 a set of modern professional mechanical engineering skills at the forefront of the discipline informed by research and industry.
- have the ability to independently select appropriate strategies to successfully plan and execute a mechanical engineering project underpinned by relevant research literature and adapt them in unfamiliar situations to produce innovative designs, systems, components or processes to fulfil new needs effectively.
- have the ability and confidence to apply their knowledge and skills to complex/unfamiliar mechanical engineering problems individually or in a group, and also communicate effectively with both those working in the field of engineering and with the wider public.
- have the ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of the mechanical engineering discipline.
- have a mastery of a range of project management techniques demonstrating analytical and critical thinking with respect to the planning of engineering design and development projects.
- have a working knowledge and understanding of business related issues, encompassing finance, development, marketing, and legal issues.
- 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.
- are able to confidently apply appropriate science, mathematics and engineering tools for solving problems in mechanical engineering, and the ability to assess the limitations of particular cases.
- have an appreciation of the social, environmental and ethical considerations affecting their engineering judgement.
- demonstrate effective leadership and the ability to manage relationships in project teams.

The MEng (Hons) Mechanical Engineering programme integrates the study of scientific and engineering principles, manufacturing and materials knowledge with business and management skills to produce graduates who will lead in developing and advancing the mechanical engineering 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.

The masters level (level 7) broadens and deepens the students' knowledge, understanding, skills and awareness from the bachelor's degree. Broadening is obtained through the Project Management and Advanced Materials units, while deepening is obtained through the Structural Integrity and Failure Analysis and Prevention units. Students apply the knowledge, understanding and skills gained in the taught units in solving complex and unfamiliar engineering problems through interdisciplinary and major engineering team projects which also develop their team working skills.

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 incorporates business and management units to develop knowledge and understanding of the commercial, economic and management aspects of engineering. All students receive seminars on professional behaviour and ethical conduct as part of their final year projects unit.

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 projects, 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 programmes to include CAD/CAM and Rapid Manufacturing. Students apply experimental mechanics techniques to validate engineering designs and also engage in electronic design and manufacture.

From the perspectives of the graduate and the employer, this route of study is an effective means to gaining the academic requirements for IEng or CEng.

ALIGNMENT WITH THE UNIVERSITY'S STRATEGIC PLAN

The MEng (Hons) Mechanical Engineering 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.

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: 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 systematic engineering design processes, involving analysing and solving unfamiliar engineering problems related to mechanical engineering;

A2 an increased range of mechanical and related engineering theories and concepts;

A3 modern mechanical engineering technologies and processes for potential application in industry at a professional engineer level taking account of a range of commercial and industrial constraints;

A4 the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service;

A5 advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose;

A6 the selection and application of different advanced techniques used in the management and control of projects, with special emphasis on both project management and teams.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• independent/group research (for project) (A1, A3, A6);

• lectures (A1-A6);

• seminars (A1–A6);

• practical tutorials (A3, A6);

• directed reading (A2, A3);

• use of the VLE (A1-A6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual/group projects (A1, A3, A6);

• examinations (A2);

• coursework (A1–A6).</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>B1 develop analytical thinking in respect of part and assembly design utilising comprehensive understanding of the scientific principles of own specialisation and related disciplines;

B2 evaluate critically current research and advanced scholarship to formulate, plan, execute and report on a project involving scientific knowledge and skills, and original mechanical engineering design in a structured and disciplined manner;

B3 critically reflect upon interpersonal skills required to operate in a team environment as a professional mechanical engineer;</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• Independent/group research (for project) (B2 – B5);

• lectures (B1–B5);

• seminars (B1–B5);

• practical tutorials (B1);

• directed reading (B1–B5);</td></tr>
</table>

B4 undertake independent evaluation and argument of alternative approaches to situations, problems or issues that occur when managing a project; **B5** plan, execute and report on the management of a complex/unfamiliar mechanical engineering project.	• use of the VLE (B1–B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual/group projects (B2- B5); • 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 identify, understand, assess and employ the appropriate advanced analytical models to solve mechanical engineering design problems recognising their limitations for particular cases; **C2** independently apply advanced simulation tools to analyse mechanical engineering design problems; **C3** use highly specialised manual and/or computer-based methods for engineering communication and presentation; **C4** apply and critically evaluate various management techniques to ensure efficient operation of a team; **C5** diagnose the causes of the different types of service failure, through the application of appropriate engineering analysis methods, and the ability to propose methods of avoiding them in future; **C6** use workshop-based material processing tools and machines, safely and effectively; **C7** use modern engineering technologies and tools to establish innovative non-routine mechanical engineering solutions and adapt engineering designs. **C8** be able to integrate knowledge and understanding of advanced materials and apply them in the solution of engineering problems.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • Individual/group projects (C1-C4, C7); • practical tutorials (C1-C3, C5-C8); • seminars (C1-C8); • use of the VLE (C1–C8). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual/group projects (C1-C4, C7, C8); • coursework (C1–C8).
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 communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards; **D2** work effectively in collaboration with others, including staff and students;	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • Individual/group projects (D1, D2, D3-D7);

D3 demonstrate creativity in problem solving and the application of knowledge across discipline areas; **D4** identify and work towards targets for personal, career, and academic development; **D5** be independent and reflective learners; **D6** gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media; **D7** distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere.	• practical tutorials (D3, D6); • seminars (D1 – D7); • use of the VLE (D1 – D7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual/group projects (D1, D2, D3-D7); • coursework (D1–D7).

LEVEL 6/BEng (Hons) INTENDED LEVEL OUTCOMES

A: 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 modern mechanical engineering technologies and processes for potential application in industry at a professional engineer level; **A2** a range of mechanical and related engineering theories and concepts; **A3** the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service; **A4** the planning, implementation and presentation of an individual project; **A5** business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (A1-A5); • lectures (A1-A5); • seminars (A1–A5); • practical tutorials (A2, A3); • directed reading (A1, A2, A4, A5); • use of the VLE (A1-A5).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (A1-A5); • examinations (A2); • coursework (A1–A5).
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 learning outcomes:

B1 approach and implement mechanical engineering in a methodical and disciplined manner; **B2** evaluate and synthesise information from a number of sources in order to gain a coherent understanding of mechanical engineering theory and practice; **B3** evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to mechanical engineering problems; **B4** plan and implement mechanical engineering design projects individually and in a group; **B5** demonstrate a level and type of education to allow the pursuit of postgraduate research in a related discipline; **B6** critically evaluate modern mechanical engineering technologies research and future trends.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (B1- B6); • group exercises (B2, B4); • practical tutorials (B3, B4, B6); • directed reading (B2, B6); • use of the VLE (B1-B6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (B1-B6); • Examinations (B2, B5); • coursework (B1–B6).
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 identify, understand and employ the appropriate analytical models to solve mechanical engineering design problems; **C2** use highly specialised manual and/or computer-based methods for engineering communication and presentation; **C3** be able to employ efficiently advanced modelling, simulation and analysis packages in mechanical engineering design; **C4** critically review and select engineering materials and material processing methods for the design of components; **C5** select and use basic workshop-based material processing tools and machines, safely and effectively; **C6** identify and safely use appropriate laboratory methods; **C7** use modern engineering technologies and tools to establish mechanical engineering solutions and adapt engineering designs.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C7); • practical tutorials (C2, C3, C5, C6, C7); • seminars (C1, C4); • use of the VLE (C1-C7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C7); • coursework (C1–C7).
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 communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards; **D2** work effectively in collaboration with others, including staff and students; **D3** demonstrate creativity in problem solving and the application of knowledge across discipline areas; **D4** identify and work towards targets for personal, career, and academic development **D5** be independent and reflective learners; **D6** use IT including the Web, spreadsheets, presentation and word processing; **D7** solve numerical and statistical problems using appropriate techniques.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1); • individual project (D1, D3-D7); • practical tutorials (D3, D6, D7); • seminars (D1, D2, D3, D5); • group exercises (D1, D2, D6); • use of the VLE (D1 – D7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual projects (D1, D3-D7); • examination (D7); • coursework (D1–D7).

LEVEL 5/DipHE INTENDED LEVEL OUTCOMES

A: Knowledge and understanding 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 an increased range of mechanical engineering principles and processes; **A2** analytical tools to apply them to engineering design and technological problems at a professional mechanical engineer level; **A3** the physical and analytical principles required to achieve solutions to a range of standard and non-standard mechanical engineering problems; **A4** management issues relating to businesses involved in design and engineering; **A5** appropriate mathematical methods to solve engineering problems.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1- A5); • seminars (A1 – A5); • directed reading (A1-A5); • use of the VLE (A1-A5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • Examinations and in-class tests (A1, A3, A5); • coursework (A1 – A5).

<table>
<tr><td>B: Intellectual skills

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 mechanical engineering in a methodical and disciplined manner;

B2 identify and evaluate information from a number of sources in order to gain a coherent understanding of mechanical engineering theory and practice;

B3 evaluate and apply scientific knowledge and skills in the development and implementation of practical solutions to mechanical engineering problems;

B4 plan and implement solutions to mechanical engineering design problems individually and in a group.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1 - B4);

• seminars (B1 – B4);

• directed reading (B1 – B4);

• use of the VLE (B1 – B4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• Examinations and in-class tests (B1,B2);

• coursework (B1 – B4).</td></tr>
<tr><td>C: Practical skills

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">C1 identify, understand and employ the appropriate mathematical models to solve mechanical engineering design problems;

C2 use highly specialised manual and/or computer-based methods for engineering communication and presentation;

C3 be able to employ efficiently advanced modelling, simulation and analysis packages in mechanical engineering design;

C4 review and select engineering materials and material processing methods for the design of components;

C5 use basic workshop-based material processing tools and machines, safely and effectively;

C6 safely use appropriate laboratory methods;

C7 collect, analyse, evaluate, present and use research information.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (C1 - C3, C6);

• coursework (C1 – C7);

• practical exercises (C1 – C7);

• group exercises (C1-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• examinations and in-class tests (C1, C4);

• coursework (C1-C7).</td></tr>
<tr><td>D: Transferable skills

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>
</table>

D1 communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards; **D2** work effectively in collaboration with others, including staff and students; **D3** demonstrate an enhanced ability in problem solving and the application of knowledge across discipline areas; **D4** identify and work towards targets for personal, career, and academic development; **D5** be independent and reflective learners; **D6** use IT including the Web, spreadsheets, presentation and word processing; **D7** solve numerical and statistical problems using appropriate techniques.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1 – D7); • seminars (D1- D7); • use of the VLE (D1 – D7); • directed reading (D1- D7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework (D1 – D7); • examinations and in-class tests (D1, D3, D5); • practical exercises (D1, D3, D6).

LEVEL 4/Cert HE INTENDED LEVEL OUTCOMES

A: Knowledge and understanding 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 mechanical engineering principles and processes; **A2** analytical tools to gain confidence in applying them to mechanical engineering design and technological problems at a professional mechanical engineer level; **A3** mathematical fundamentals, models and processes and their application to a range of mechanical engineering principles and processes.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1- A3); • seminars (A1 – A3); • directed reading (A1-A3); • use of the VLE (A1-A3).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations and in-class tests (A1-A3); • coursework essays (A1 – A3); • practical exercises (A1).
B: Intellectual skills 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 mechanical engineering in a methodical and disciplined manner; **B2** review and use information from a number of sources in order to gain a coherent understanding of mechanical engineering theory and practice; **B3** evaluate and apply basic scientific knowledge and skills in the development and implementation of practical solutions to mechanical engineering problems.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1, B2); • seminars (B1 – B3); • directed reading (B1 – B3); • use of the VLE (B1 – B3).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations and in-class tests (B1, B2); • coursework (B1 – B3); • practical exercises (B3).
C: Practical skills 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 mechanical engineering design problems; **C2** use highly specialised manual and/or computer-based methods for engineering communication and presentation; **C3** review and select engineering materials and material processing methods for the design of components; **C4** use basic workshop-based material processing tools and machines, safely and effectively; **C5** use basic electrical and electronic components, safely and effectively; **C6** safely use appropriate laboratory methods.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1 – C6); • coursework (C1 – C6); • practical exercises (C1 – C6); • group exercises (C1-C6).
	Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • examinations and in-class tests (C1, C3); • coursework (C1- C6); • practical exercises (C1- C6).
D: Transferable skills 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; **D2** work effectively in collaboration with others, including staff and students; **D3** demonstrate ability in problem solving and the application of knowledge across discipline areas; **D4** identify and work towards targets for personal, career, and academic development; **D5** develop reflection in learning; **D6** use IT including the Web, spreadsheets, presentation and word processing; **D7** solve numerical and statistical problems using appropriate techniques.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1 – D6); • seminars (D1- D7); • use of the VLE (D1 – D7); • directed reading (D1- D7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • coursework (D1 – D7); • examinations and in-class tests (D1, D3, D7); • practical exercises (D1- D7).

ADMISSION REGULATIONS

Please refer to the BU website for further information regarding admission regulations for this programme: https://www.bournemouth.ac.uk/study/courses/meng-hons-mechanical-engineering-0

ASSESSMENT REGULATIONS

The regulations for this programme are the University's Standard Integrated Masters Assessment Regulations (https://intranetsp.bournemouth.ac.uk/pandptest/6a-standard-assessment-regulations-integrated-masters.pdf) with the following exceptions:

COMPENSATION (Section 7)
Compensation may only be applied for up to 20 credits across all levels of the programme and cannot be applied to the level 7 group project units.

PROGRESSION (Section 8)
To proceed to Level 7, students must normally achieve 120 Level 6 credits, and will be required to complete the BEng (Hons) part of the programme with an upper second class or first class profile. Where appropriate, students must successfully complete the specified work experience.

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 3000 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

	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	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	D 1	D 2	D 3	D 4	D 5	D 6	D 7
LEVEL 7	Structural Integrity (20)	x	x	x	x	X		x					x	x			x		x		x		x			x	
	Interdisciplinary Group Project (20)	x				x	x			x		x				x					x	x	x	x	x	x	x
	Major Engineering Team Project (20)	x		x	x	x	X	x	x	x	x	X	x	x	x	x		x	x		x	x	x	x	x	x	x
	Failure Analysis and Prevention (20)	x	x	x	x	x		x					x				x				x		x			x	
	Advanced Materials (20)		x					x					x				x			x	x		x			x	
	Project Management (20)					x	x		X	x	x					x					x	x		x	x		x
LEVEL 6	Computational Engineering (20)	x	x	x	x	X		x					x	x	x		x		x		x		x		x	x	
	Thermofluids and Energy Conversion (20)	x	x	x	x	X		x	X				x	x			x		x		x	x	x		x	x	x
	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
	Business Development (20)						x				x	x									x	x	x	x	x	x	x
	Advanced Stress and Vibration (20)	x	x	x	x	x		x					X				x				x		x				
LEVEL 5	Manufacturing and Engineering Materials (20)	x	x	x				x	x				X				x			x	x	x					
	Management and Commercialisation (20)						x				x	x				x					x	x	x				
	Engineering Simulation (20)	x	x	x	x			x					X	x	x		x				x		x			x	
	Engineering Mathematics for Mechanical Systems Design (20)	x	x	x	x			x			x	x	X	x	x						x	x	x			x	
	Stress and Dynamics (20)	x	x	x	x			x					X	x			x				x		x				
	Fluids and Thermodynamics (20)	x	x	x	x			x					X				x				x		x				
LEVEL 4	Engineering Mathematics (20)	x		x	x			x					x								x	x				x	
	Electrical and Electronic Principles (20)	x		x	x			x	x				x	x							x	x				x	
	Engineering Design and Practice (20)	x		x	x	x	x	x	x			x	x	x	x			x	x		x	x	x	x	x	x	x
	Engineering Principles A (20)	x		x	x			x					x	x							x	x				x	
	Materials and Practice (20)	x		x	x			x									x	x		x	x	x				x	
	Engineering Principles B (20)	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. systematic engineering design processes, involving analysing and solving unfamiliar engineering problems related to mechanical engineering; 2. an increased range of mechanical and related engineering theories and concepts; 3. modern mechanical engineering technologies and processes for potential application in industry at a professional engineer level taking account of a range of commercial and industrial constraints; 4. the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service; 5. advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose; 6. the selection and application of different advanced techniques used in the management and control of projects, with special emphasis on both project management and teams.	**C – Subject-specific/Practical Skills** This programme provides opportunities for students to: 1. identify, understand, assess and employ the appropriate advanced analytical models to solve mechanical engineering design problems recognising their limitations for particular cases; 2. independently apply advanced simulation tools to analyse mechanical engineering design problems; 3. use highly specialised manual and/or computer-based methods for engineering communication and presentation; 4. apply and critically evaluate various management techniques to ensure efficient operation of a team; 5. diagnose the causes of the different types of service failure, through the application of appropriate engineering analysis methods, and the ability to propose methods of avoiding them in future; 6. use workshop-based material processing tools and machines, safely and effectively; 7. use modern engineering technologies and tools to establish innovative non-routine mechanical engineering solutions and adapt engineering designs. 8. be able to integrate knowledge and understanding of advanced materials and apply them in the solution of engineering problems.
B – Intellectual Skills This programme provides opportunities for students to: 1. develop analytical thinking in respect of part and assembly design utilising comprehensive understanding of the scientific principles of own specialisation and related disciplines; 2. evaluate critically current research and advanced scholarship to formulate, plan, execute and report on a project involving scientific knowledge and skills, and original mechanical engineering design in a structured and disciplined manner; 3. critically reflect upon interpersonal skills required to operate in a team environment as a professional mechanical engineer; 4. undertake independent evaluation and argument of alternative approaches to situations, problems or issues that occur when managing a project; 5. plan, execute and report on the management of a complex/unfamiliar mechanical engineering project.	**D – Transferable Skills** This programme provides opportunities for students to: 1. communicate effectively and confidently by oral, written and visual means to appropriate professional and academic standards; 2. work effectively in collaboration with others, including staff and students; 3. demonstrate creativity in problem solving and the application of knowledge across discipline areas; 4. identify and work towards targets for personal, career, and academic development; 5. be independent and reflective learners; 6. gather, select, and analyse a range of experimental and fieldwork data and present professionally using appropriate media; 7. distil, synthesise and critically analyse alternative approaches and methodologies to problems and research results reported in literature and elsewhere.