Bournemouth University

Programme Specification – Section 1

KEY PROGRAMME INFORMATION

Originating institution(s) Bournemouth University	**Faculty responsible for the programme** Faculty of Media, Science and Technology
Final award(s), title(s) and credits BEng (Hons) Engineering – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits / 120 (60 ECTS) / Level 6 credits BEng (Hons) Engineering (mechanical design) – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits / 120 (60 ECTS) / Level 6 credits BEng (Hons) Engineering (electronic design) – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits / 120 (60 ECTS) / Level 6 credits BEng (Hons) Engineering (manufacturing management) – 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits / 120 (60 ECTS) / Level 6 credits	
Intermediate award(s), title(s) and credits HNC Engineering (mechanical design) – 120 (60 ECTS) Level 4 credits HNC Engineering (electronic design) – 120 (60 ECTS) level 4 credits HNC Engineering (manufacturing management) – 120 (60 ECTS) Level 4 credits HNC Engineering (marine technologies) – 120 (60 ECTS) Level 4 credits FdEng Engineering (mechanical design) - 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits FdEng Engineering (electronic design) - 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits FdEng Engineering (manufacturing management) - 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits FdEng Engineering (marine technologies) - 120 (60 ECTS) Level 4 / 120 (60 ECTS) Level 5 credits	
UCAS Programme Code(s) (where applicable and if known) NA	**HECoS (Higher Education Classification of Subjects) Code and balanced or major/minor load.** 100184 (Major) 100213 (Minor)
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) fourth edition from the Engineering Council UK (January 2014); UK Standard for Professional Engineering Competence: The Accreditation of Higher Education Programmes fourth edition from the Engineering Council UK (Aug 2020).	
Professional, Statutory and Regulatory Body (PSRB) links The **BEng (Hons) Engineering** and **BEng Engineering (Mechanical Design)** programmes have been accredited by both the Institution of Engineering Designers (IED) and the Institution of Mechanical Engineers (IMechE) for the 2025 to 2029 intake years under the following terms: The accredited BEng (Hons) fully meets the exemplifying academic benchmark requirements, for registration as an Incorporated Engineer (IEng). It will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) and Students will need to complete an approved format of further learning pursuant to the requirements of UK-SPEC. The **BEng (Hons) Engineering (Manufacturing Management)** and **BEng (Hons) Engineering (Mechanical Design)** programmes have been accredited by the Institution of Engineering Designers (IED) for the 2025 to 2029 intake years under the following terms: The accredited BEng (Hons) fully meets the exemplifying academic benchmark requirements, for registration as an Incorporated Engineer (IEng). It will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) and Students will need to complete an approved format of further learning pursuant to the requirements of UK-SPEC. The **FdEng Engineering (Marine Technologies)** and **FdEng Engineering (Mechanical Design)** programmes have been accredited by both the Institution of Engineering Designers (IED) and the Institution of Mechanical Engineers (IMechE) for the 2025 to 2029 intake years under the following terms: The accredited FdEng will meet, in part, the exemplifying academic benchmark requirements, for registration as an Incorporated Engineer (IEng). It will meet, in part, the exemplifying academic benchmark requirements for registration as an Incorporated Engineer (IEng) and Students will need to complete an approved format of further learning pursuant to the requirements of	

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UK-SPEC.

The **FdEng Engineering (Manufacturing Management)** and **FdEng Engineering (Mechanical Design)** programmes have been accredited by the Institution of Engineering Designers (IED) for the 2025 to 2029 intake years under the following terms: The accredited FdEng fully meets the exemplifying academic benchmark requirements, for registration as an Incorporated Engineer (IEng). It will meet, in part, the exemplifying academic benchmark requirements for registration as a Chartered Engineer (CEng) and Students will need to complete an approved format of further learning pursuant to the requirements of UK-SPEC.

The **HNC Engineering (Marine technologies)**, **HNC Engineering (Mechanical Design)**, **HNC Engineering (Electronic Design)**, and **HNC Engineering (Manufacturing Management)**, have been accredited by the Institution of Engineering Designers (IED) for the 2025 to 2029 intake years under the following terms: The accredited HNC fully meets the exemplifying academic benchmark requirements for registration as an Engineering Technician (EngTech).

Mappings to PSRB outcomes for IEng and Partial CEng can be found in Appendix E.

Places of delivery Bournemouth & Poole College, Poole Campus levels 4 & 5 Bournemouth University, Talbot Campus level 6	
Mode(s) of delivery Day release levels 4 & 5 Part-time blended learning levels 6	**Language of delivery** English
Typical duration Programme duration:5 years part-time Level 4: 2 years Level 5: 12 months Level 6: 2 years	
Date of first intake September 2025	**Expected start dates** September
Maximum student numbers Not applicable	**Placements** NA – this programme is for those in engineering employment only.
Partner(s) Bournemouth & Poole College	**Partnership model** Franchise
Date of this Programme Specification October 2025	
Version number v1.3-0926	
Approval, review or modification reference numbers E232434 FST2425 17 approved 19/03/2025, previously v1.0 FST2425 28, approved 12/06/2025, previously v1.1 MST2526 01, approved 26/08/2025, previously v1.2 EC2526 09, approved 10/10/2025, version remains unchanged	
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PROGRAMME STRUCTURE

Students undertake one of the following pathways:

- HNC Engineering (Manufacturing Management) + FdEng Engineering (Manufacturing Management) + BEng Engineering (Manufacturing Management)
- HNC Engineering (Mechanical Design) + FdEng Engineering (Mechanical Design) + BEng Engineering (Mechanical Design)
- HNC Engineering (Electronic Design) + FdEng Engineering (Electronic Design) + BEng Engineering (Electronic Design)
- HNC Engineering (Marine Technologies) + FdEng Engineering (Marine Technologies) + BEng Engineering

Programme Award and Title: BEng (Hons) Engineering (Manufacturing Management)

Years 1&2 / 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			
Analytical Methods for Manufacturing	Core	20	50%	50%			110	4.0	101028
Business	Core	20			60%	40%	110	1.0	100079 (Major) 100812 (Minor)
Computer Aided Engineering	Core	20			50%	50%	110	4.0	100160
Manufacturing Processes	Core	20			60%	40%	110	4.0	100209 (Major) 100033 (Minor)
Project	Core	20			100%		110	4.0	100184
Supply Chain Management	Core	20			60%	40%	110	2.0	100209 (Major) 100093 (Minor)

Exit qualification: HNC Engineering (Manufacturing Management)
Part -Time award: requires 120 credits at Level 4

Programme Award and Title: BEng (Hons) Engineering (Manufacturing Management)
Admission Requirements: 120 credits at Level 4 from a relevant qualification

Year 3 / Level 5
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	Exam 2	Cwk 1	Cwk 2			
Industrial Robotics	Core	20			60%	40%	110	4.0	100170
Major Project	Core	40			100%		110	4.0	100184
Quality Management	Core	20			40%	60%	110	4.0	100213
The Engineering Professional	Core	20			50%	50%	110	4.0	100184

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Work Based Unit	Core	20			100%		110	4.0	100184

Exit qualification: FdEng Engineering (Manufacturing Management)
Part Time Award: Requires 120 credits at Level 4 and 120 credits at Level 5

Programme Award and Title: BEng (Hons) Engineering (Manufacturing Management)
Admission Requirements: 120 credits at Level 4 and 120 credits at Level 5 from a relevant accredited qualification

Year 4/5 /Level 6
Students are required to complete 4 core units and 1 option unit

Unit Name	**Core/ Option**	**No of credits**	**Assessment Element Weightings**				**Expected contact hours per unit**	**Unit version no.**	**HECoS Code (plus balanced or major/minor load)**
			Exam 1	**Exam 2**	**Cwk 1**	**Cwk 2**			
BEng Project (FL)	Option	40			100%		39	2.0	100184
Advanced Engineering (FL)	Core	20			100%		25	3.0	100184
EPA BEng Project & Professional Practice (Manufacturing Engineer)	Option	40			100%		30	1.0	100184
Preparation for End Point Assessment (FL)	Option	0			Pass/ Fail	Pass/ Fail	24	1.0	100184
Innovation and Professional Practice (FL)	Core	20	30%		70%		25	1.1	101221
Manufacturing Operations (FL)	Core	20			100%		25	3.0	100209
Computational Engineering (FL)	Core	20			100%		25	3.0	100160

End Point Assessment

This award covers both integrated and non-integrated apprenticeships.
The end-point assessment (EPA) for the non-integrated apprenticeship is carried out by an external End Point Assessment Organisation and the degree apprentices must pass both the BEng Project FL and Preparation for End Point Assessment Unit to gain the exit qualification.
The end-point assessment (EPA) for the integrated apprenticeship must pass the EPA BEng Project & Professional Discussion (Manufacturing Engineer) unit.
The apprentice must pass the EPA to complete the apprenticeship and gain the exist qualification.

The EPA period must only start once the employer and BPC/BU are satisfied that the apprentice is demonstrating the knowledge, skills and behaviours of the apprenticeship standard, and all of the pre-requisite gateway requirements for EPA as defined in the assessment plan and apprenticeship funding rules have been met. Mappings to KSBs can be found in Appendix F.

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the BEng Engineering programmes
Exit qualification: BEng (Hons) Engineering (Manufacturing Management)
Part Time Award: Requires 120 credits at Level 4, 120 credits at Level 5 and 120 credits at Level 6.

OR

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Programme Award and Title: BEng (Hons) Engineering (Mechanical Design)

Years 1&2 / 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			
Analytical Methods for Design	Core	20	50%	50%			110	4.0	101028
Business	Core	20			60%	40%	110	1.0	100079 (Major) 100812 (Minor)
Computer Aided Engineering	Core	20			50%	50%	110	4.0	100160
Design Principles	Core	20			60%	40%	110	4.0	100182
Project	Core	20			100%		110	4.0	100184
Mechanical Design Principles	Core	20	40%		60%		110	4.0	100430 (Major) 100033 (Minor)

Exit qualification: HNC Engineering (Mechanical Design)
Part -Time award: requires 120 credits at Level 4

Programme Award and Title: BEng (Hons) Engineering (Mechanical Design)
Admission Requirements: 120 credits at Level 4, from a relevant qualification

Year 3 / 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			
Design Applications	Core	20			60%	40%	110	4.0	100182
Major Project	Core	40			100%		110	4.0	100184
Mechanical Design Application	Core	20	50%	50%			110	4.0	100430
The Engineering Professional	Core	20			50%	50%	110	4.0	100184
Work Based Unit	Core	20			100%		110	4.0	100184

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the FdEng Engineering programmes
Exit qualification: FdEng Engineering (Mechanical Design)
Part Time Award: Requires 120 credits at Level 4 and 120 credits at Level 5

Programme Award and Title: BEng (Hons) Engineering (Mechanical Design)
Admission Requirements: 120 credits at Level 4 and 120 credits at Level 5, from a relevant accredited qualification

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Year 4/5 /Level 6
Students are required to complete 4 core units and 1 option unit

Unit Name	Core/ Option	No of credits	Assessment Element Weightings				Expected contact hours per unit	Unit version no.	HECoS Code (plus balanced or major/minor load)
			Exam 1	Exam 2	Cwk 1	Cwk 2			
BEng Project (FL)	Option	40			100%		39	2.0	100184
Advanced Engineering (FL)	Core	20			100%		25	3.0	100184
EPA BEng Project & Professional Discussion (PDD Engineer)	Option	40			100%		39	1.0	
Preparation for End Point Assessment	Option	0			100%				
Innovation and Professional Practice (FL)	Core	20	30%		70%		25	1.1	101221
Advanced Stress and Vibration (FL)	Core	20	70%		30%		25	1.1	100190
Computational Engineering (FL)	Core	20			100%		25	3.0	100160

End Point Assessment

This award covers both integrated and non-integrated apprenticeships.
The end-point assessment (EPA) for the non-integrated apprenticeship is carried out by an external End Point Assessment Organisation and the degree apprentices must pass both the BEng Project FL and EPA Unit to gain the exit qualification.
The end-point assessment (EPA) for the integrated apprenticeship must pass the EPA BEng Project & Professional Discussion (PDD Engineer) unit.
The apprentice must pass the EPA to complete the apprenticeship and gain the exist qualification.

The EPA period must only start once the employer and BPC/BU are satisfied that the apprentice is demonstrating the knowledge, skills and behaviours of the apprenticeship standard, and all of the pre-requisite gateway requirements for EPA as defined in the assessment plan and apprenticeship funding rules have been met. Mappings to KSBs can be found in Appendix F.

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the BEng Engineering programmes
Exit qualification: BEng (Hons) Engineering (Mechanical Design)
Part Time Award: Requires 120 credits at Level 4, 120 credits at Level 5 and 120 credits at Level 6.

OR

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Programme Award and Title: BEng (Hons) Engineering (Electronic Design)

Years 1&2 / 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			
Analytical Methods for Design	Core	20	50%	50%			110	4.0	101028
Business	Core	20			60%	40%	110	1.0	100079 (Major) 100812 (Minor)
Circuit Analysis and Fault Location Techniques	Core	20	40%	60%			110	4.0	100165
Software Design Principles	Core	20	20%		80%		110	1.0	100365 (Major) 100373 (Minor)
Project	Core	20			100%		110	4.0	100184
Electronic Systems Design	Core	20	25%		75%		110	4.0	100165

Exit qualification: HNC Engineering (Electronic Design)
Part -Time award: requires 120 credits at Level 4

Programme Award and Title: BEng (Hons) Engineering (Electronic Design)
Admission Requirements: 120 credits at Level 4, from a relevant qualification

Year 3 / Level 5
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	Exam 2	Cwk 1	Cwk 2			
Applied Software in Engineering	Core	20			50%	50%	110	2.0	100374
Major Project	Core	40			100%		110	4.0	100184
Electronic Design Applications	Core	20			40%	60%	110	4.0	100165
The Engineering Professional	Core	20			50%	50%	110	4.0	100184
Work Based Unit	Core	20			100%		110	4.0	100184

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the FdEng Engineering programmes

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Exit qualification: FdEng Engineering (Electronic Design)
Part Time Award: Requires 120 credits at Level 4 and 120 credits at Level 5

Programme Award and Title: BEng (Hons) Engineering (Electronic Design)
Admission Requirements: 120 credits at Level 4 and 120 credits at Level 5, from a relevant accredited qualification

Year 4/5 /Level 6
Students are required to complete 5 core units and 1 option unit

Unit Name	Core/ Option	No of credits	Assessment Element Weightings				Expected contact hours per unit	Unit version no.	HECoS Code (plus balanced or major/minor load)
			Exam 1	Exam 2	Cwk 1	Cwk 2			
BEng Project (FL)	Option	40			100%		39	2.0	100184
Advanced Engineering (FL)	Core	20			100%		25	3.0	100184
EPA BEng Project & Professional Discussion (Manufacturing Engineer)	Option	40			100%		39	1.0	
Preparation for End Point Assessment	Option	0			100%				
Innovation and Professional Practice (FL)	Core	20	30%		70%		25	1.1	101221
Mechatronics (FL)	Core	20			40%	60%	25	2.0	100170
Manufacturing Operations (FL)	Core	20			100%		25	3.0	100209

End Point Assessment

This award covers both integrated and non-integrated apprenticeships.
The end-point assessment (EPA) for the non-integrated apprenticeship is carried out by an external End Point Assessment Organisation and the degree apprentices must pass both the BEng Project FL and Preparation for End Point Assessment Unit to gain the exit qualification.
The end-point assessment (EPA) for the integrated apprenticeship must pass the EPA BEng Project & Professional Discussion (Manufacturing Engineer) unit.
The apprentice must pass the EPA to complete the apprenticeship and gain the exist qualification.

The EPA period must only start once the employer and BPC/BU are satisfied that the apprentice is demonstrating the knowledge, skills and behaviours of the apprenticeship standard, and all of the pre-requisite gateway requirements for EPA as defined in the assessment plan and apprenticeship funding rules have been met. Mappings to KSBs can be found in Appendix F.

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the BEng Engineering programmes
Exit qualification: BEng (Hons) Engineering (Electronic Design)
Part Time Award: Requires 120 credits at Level 4, 120 credits at Level 5 and 120 credits at Level 6.

OR from any bracketed pathway including marine technologies

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Programme Award and Title: BEng (Hons) Engineering

Years 1&2 / 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			
Analytical Methods for Manufacturing	Core	20	50%	50%			110	4.0	101028
Business	Core	20			60%	40%	110	1.0	100079 (Major) 100812 (Minor)
Marine Electrical and Electronic Principles	Core	20	40%		60%		110	2.0	100194
Mechanical Design Principles	Core	20	40%		60%		110	4.0	100430 (Major) 100033 (Minor)
Project	Core	20			100%		110	4.0	100184
Supply Chain Management	Core	20			60%	40%	110	2.0	100209 (Major) 100093 (Minor)

Exit qualification: HNC Engineering Marine Technologies)
Part -Time award: requires 120 credits at Level 4

Programme Award and Title: BEng (Hons) Engineering
Admission Requirements: 120 credits at Level 4, from a relevant qualification

Year 3 / Level 5
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	Exam 2	Cwk 1	Cwk 2			
Marine Auxiliary Systems	Core	20			40%	60%	110	2.0	100170
Major Project	Core	40			100%		110	4.0	100184
Quality Management	Core	20			50%	50%	110	4.0	100213
The Engineering Professional	Core	20			50%	50%	110	4.0	100184
Work Based Unit	Core	20			100%		110	4.0	100184

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Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the FdEng Engineering programmes
Exit qualification: FdEng Engineering (Marine Technologies)
Part Time Award: Requires 120 credits at Level 4 and 120 credits at Level 5

Programme Award and Title: BEng (Hons) Engineering
Admission Requirements: 120 credits at Level 4 and 120 credits at Level 5 from a relevant accredited qualification

Programme Award and Title: BEng (Hons) Engineering

Year 4/5/Level 6
Students are required to complete 3 core units and choose 2 optional unit
Unit Computational Engineering (FL) may have limitations on numbers because of lab availability Unit Mechatronics (FL) may have limitations on numbers because of lab availability

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			
BEng Project (FL)	Option	40			100%		39	2.0	100184
Advanced Engineering (FL)	Core	20			100%		25	3.0	100184
EPA BEng Project & Professional Discussion (PDD Engineer)	Option	40			100%			1.0	
Preparation for End Point Assessment	Option	0			100%				
Innovation and Professional Practice (FL)	Core	20	30%		70%		25	1.1	101221
Advanced Stress and Vibration (FL)	Option	20	70%		30%		25	1.1	100190
Manufacturing Operations (FL)	Option	20			100%		25	3.0	100209
Computational Engineering (FL)	Option	20			100%		25	3.0	100160
Mechatronics (FL)	Option	20			40%	60%	25	2.0	100170

End Point Assessment

This award covers both integrated and non-integrated apprenticeships.
The end-point assessment (EPA) for the non-integrated apprenticeship is carried out by an external End Point Assessment Organisation and the degree apprentices must pass both the BEng Project FL and Preparation for End Point Assessment Unit to gain the exit qualification.
The end-point assessment (EPA) for the integrated apprenticeship must pass the EPA BEng Project & Professional Discussion (PDD Engineer) unit.
The apprentice must pass the EPA to complete the apprenticeship and gain the exist qualification.

The EPA period must only start once the employer and BPC/BU are satisfied that the apprentice is demonstrating the knowledge, skills and behaviours of the apprenticeship standard, and all of the pre-requisite gateway requirements for EPA

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as defined in the assessment plan and apprenticeship funding rules have been met. Mappings to KSBs can be found in Appendix F.

Progression requirements: Students with a minimum classification of Pass will be automatically accepted for entry with advanced standing to the BEng Engineering programme**s**
Exit qualification: BEng (Hons) Engineering
Part Time Award: Requires 120 credits at Level 4, 120 credits at Level 5 and 120 credits at Level 6

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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 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 an 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, demonstrating effective leadership and the ability to manage relationships in project teams, and communicating 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 a broad understanding of business and management processes, security risks, and the application of business law and intellectual property.
- 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.

The MEng (Hons) Engineering programme will develop high calibre engineers who are able to function both as an engineer and a technology leader in industries such as aerospace, marine, electronic, automotive, alternative energy, oil and gas, and similar high-tech industries.

Key to the exploitation of emerging technologies is understanding their behaviour, performance and limitations. The ability to model and simulate the performance of new technologies is paramount where design optimisation is required.

Advanced modelling and simulation techniques can also be harnessed to shorten design time and reduce market entry costs. This is essential where emerging technologies are exploited as existing methodologies may prohibit lengthy development programmes.

Understanding how emerging technologies can be harnessed through enterprise is essential for an innovative market. Therefore, sound business knowledge is required as well as identifying avenues for research funding and strategic collaboration.

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The main emphasis of the programme will be in studying solid-state mechanics, manufacturing, electronic design and/or modern/non-traditional engineering technologies and their integration. An aligned individual project at levels 5 and 6 together with up-to-date engineering skills will ensure the graduate can not only understand the technologies but apply them.

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 Inter-Disciplinary Group Project, Design Management and Robotic Control Design units, while deepening is obtained through the Life Cycle Management, Failure Analysis and Prevention and Model Based Engineering units. Students apply the knowledge, understanding and skills gained in the taught units through the MEng Project which provides an opportunity to critically investigate and report on a particular technical engineering issue in depth.

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.

The MEng (Hons) Engineering part time (flexible learning) route has been developed specifically for engineers in employment. The programme has flexible entry and exit points to suit those with different educational requirements. The programme at levels 6 and 7 is not a traditional day release programme, each unit is predominately studied through distance learning supported by a number of face-to-face tutorials with academic staff and peers. The programme does follow a more traditional day release model at level 4 and 5 which is taught at Bournemouth & Poole College. In addition, mentoring of students to enable them to gain professional engineering qualifications will be offered (dependent upon relevant industrial experience).

ALIGNMENT WITH THE UNIVERSITY'S STRATEGIC PLAN

The MEng (Hons) 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, 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.

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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.

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

PROGRAMME INTENDED OUTCOMES

LEVEL 6/BEng (Hons) Engineering (Mechanical Design)/ LEVEL 5/FdEng Engineering (Mechanical Design)/ LEVEL4/HNC Engineering (Mechanical Design) INTENDED LEVEL OUTCOMES

See Appendix A

LEVEL 6/BEng Engineering (Electronic Design)/ LEVEL 5/FdEng Engineering (Electronic Design)/ LEVEL 4/HNC Engineering (Electronic Design) INTENDED LEVEL OUTCOMES
See Appendix B

LEVEL 6/BEng Engineering (Manufacturing Management)/ LEVEL 5/FdEng Engineering (Manufacturing Management)/ LEVEL 4/HNC Engineering (Manufacturing Management) INTENDED LEVEL OUTCOMES
See Appendix C

LEVEL 6/BEng Engineering/ LEVEL 5/FdEng Engineering (Marine Technologies)/ LEVEL 4/HNC Engineering (Marine Technologies) INTENDED LEVEL OUTCOMES
See Appendix D

ADMISSION REGULATIONS

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

All applicants

- One A Level at grade C in a relevant subject or
- A BTEC National Certificate or National Diploma in Manufacturing or Engineering (Mechanical Design): students should normally have a Merit in Mathematics and/or Mechanical Principles,
- UCAS tariff points 32 from one full A Level or equivalent Level 3 qualification in a relevant subject.
- For degree apprentice applicants A Level at grade C in a relevant subject 32 UCAS Points or 90+ credits BTEC Engineering (Mechanical Design) 24 UCAS Points
- Four GCSEs of at least grade 4/C, to include English and Mathematics or an equivalent qualification
- For degree apprentice applicants Five GCSEs at at least grade 4/C, to include English and mathematics and a relevant subject

Entry to Level 6

- Applicants to level 6 for the BEng Engineering (all pathways) programme require a FdSc, FdEng or HND with Pass in a relevant engineering discipline accredited to EngTech, partial IEng or IEng.

PROGRESSION ROUTES

Partnership arrangements provide formally approved progression routes through which students are eligible to apply for a place on a programme leading to a BU award.
Please find information on Global Partnerships here: Global partnerships | Bournemouth University

ASSESSMENT REGULATIONS

The regulations for this programme are the University's Standard Undergraduate Assessment

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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, or those in the following list:

- Innovation and Professional Practice (Level 6);
- Mechatronics (Level 6);
- Computational Engineering (Level 6);
- Advanced Engineering (Level 6);
- Business (Level 4).

For those exiting at FdEng (level 5) the regulations for this programme are the University's Standard Foundation Degree Assessment Regulations (https://intranetsp.bournemouth.ac.uk/pandptest/6a-standard-assessment-regulations-foundation.pdf) 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, or those in the following list:

- Business (Level 4).

For those exiting at HNC (level 4) the regulations for this programme are the University's Standard Assessment Regulations for Higher National Programmes (https://intranetsp.bournemouth.ac.uk/pandptest/6a-standard-assessment-regulations-higher-national.pdf) 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, or those in the following list:

- Business (Level 4).

WORK BASED LEARNING (WBL) AND PLACEMENT ELEMENTS

As the part time degree apprentice students are employed in the engineering industry, all units offer informal opportunity for reflection on current practice which may be documented subsequently as evidence of work based learning.

All students, undertake a number of industry related projects. These can be carried out within a company or developed within the college/university environment. In both cases the projects involve direct contact with the customer and as such are 'live' projects. When a project is carried, students will normally design and develop a project specified by a company.

Site visits, presentations by and discussions with industry representatives will also ensure that a "real world" understanding of project management is achieved.

An assessed Work Based learning unit is incorporated within the FdEng Programme and offers an opportunity for learners to obtain credit for and to reflect upon their learning either formally by way of in-service training courses, or informally on a day-to-day basis in the workplace. Reflective logs are used to facilitate students' learning and encourage the transferability of knowledge between study and the workplace. The unit is designed to encourage the students to review what they do at work in light of the UK Standard for Professional Engineering Competence (UK-SPEC), fulfilling the competence and commitment requirements for registration as an Incorporated Engineer (IEng). The criteria for assessment of the Work Based Learning opportunities can be found in the level 5 Work Based Unit Specification.

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All students, undertake an industry related Major Project at level 5 and BEng Project at level 6. This can be carried out within a company or developed within the academic environment. In both cases the projects involve direct contact with the customer.

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	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	D 1	D 2	D 3	D 4	D 5	D 6	D 7
LEVEL 7	MEng Project (FL) (40)	x	x	x	x	x		x	x		x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
	Design Management (20)				x		x		x	x	x	x				x				x	x	x	x	x		x
	Life Cycle Management (20)			x	x			x					x	x					x	x	x	x	x	x		
	Model Based Engineering (20)	x	x	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
	Robotic Control Design (20)	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	

Programme Skills Matrix – BEng (Hons) Engineering

	Units	Programme Intended Learning Outcomes																								
		A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	C 1	C 2	C 3	C 4	C 5	C 6	C 7	D 1	D 2	D 3	D 4	D 5	D 6	D 7
LEVEL 6	Advanced Engineering (FL) (20)	x	x				x	x	x		x	x	x		x	x		x	x	x	x	x		x	x	x
	BEng Project (FL) or EPA BEng Project (FL) (40)	x	x	x	x	x	x	x	x		x		x	x	x			x	x	x		x	x	x	x	x
	Innovation and Professional Practice (FL) (20)			x	x	x				x	x									x	x	x	x	x	x	
	Computational Engineering (FL) (20)	x	x				x		x		x		x	x	x	x			x	x		x		x	x	x
	Mechatronics (FL) (20)	x	x																							
	Manufacturing Operations (FL) (20)	x	x					x			x	x	x			x				x	x	x		x	x	x
	Advanced Stress and Vibration (FL) (20)	x	x				x	x	x		x		x		x	x		x		x		x			x	x

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Programme Skills Matrix - BEng (Hons) Engineering (Mechanical Design)

	Units	Programme Intended Learning Outcomes																								
		A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	C 1	C 2	C 3	C 4	C 5	C 6	C 7	D 1	D 2	D 3	D 4	D 5	D 6	D 7
LEVEL 6	Advanced Engineering (FL) (20)	x	x				x	x	x		x	x	x		x	x		x	x	x	x	x		x	x	x
	BEng Project (FL) (40) or EPA BEng Project (FL)	x	x	x	x	x	x	x	x		x		x	x	x			x	x	x		x	x	x	x	x
	Innovation & Professional Practice (FL) (20)			x	x	x				x	x									x	x	x	x	x	x	
	Computational Engineering (FL) (20)	x	x				x		x		x		x	x	x	x			x	x		x		x	x	x
	Advanced Stress and Vibration (FL) (20)	x	x				x	x	x		x		x		x	x		x		x		x			x	x

Programme Skills Matrix – FdEng Engineering (Mechanical Design)

	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	D 1	D 2	D 3	D 4
LEVEL 5	Design Applications	x	x	x		x	x	x	x	x	x	x		x		x		x	x	
	Major Project	x	x	x	x	x	x	x	x	x	x	x		x		x		x	x	
	Mechanical Design Applications	x	x				x	x					x		x			x		
	The Engineering Professional				x	x					x						x	x	x	x
	Work Based Unit	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x

Programme Skills Matrix – HNC Engineering (Mechanical Design)

	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	D 1	D 2	D 3	D 4
LEVEL 4	Analytical Methods for Design	x	x					x												
	Business				x	x					x	x				x	x	x	x	x
	Computer Aided Engineering			x		x	x		x					x		x		x	x	x
	Design Principles	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Mechanical Design Principles	x	x	x				x		x			x		x				x	x
	Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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Programme Specification - Section 2

BEng (Hons) Engineering
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Programme Skills Matrix – BEng (Hons) Engineering (Electronic Design)

	Units	Programme Intended Learning Outcomes																								
		A 1	**A 2**	**A 3**	**A 4**	**A 5**	**B 1**	**B 2**	**B 3**	**B 4**	**B 5**	**B 6**	**C 1**	**C 2**	**C 3**	**C 4**	**C 5**	**C 6**	**C 7**	**D 1**	**D 2**	**D 3**	**D 4**	**D 5**	**D 6**	**D 7**
LEVEL 6	Advanced Engineering (FL) (20)	x	x				x	x	x		x	x	x		x	x		x	x	x	x	x		x	x	x
	BEng Project (FL) or EPA BEng Project (FL) (40)	x	x	X	X	x	x	x	x		x		x	x	x			x	x	x		x	x	x	x	x
	Innovation and Professional Practice (FL) (20)			X	x	x				x	x									x	x	x	x	x	x	
	Mechatronics (FL) (20)	x	x				x		x		x		x		x			x		x						x
	Manufacturing Operations (FL) (20)	x	x					x			x	x	x			x				x	x	x		x	x	x

Programme Skills Matrix – FdEng Engineering (Electronic Design)

	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**	**D 1**	**D 2**	**D 3**	**D 4**
LEVEL 5	Applied Software in Engineering	x	x	x		x	x	x	x	x		x	x	x	x					
	Electronic Design Applications	x	x	x		x	x	x	x	x		x	x	x	x					
	Major Project	x	x	x	x	x	x	x	x	x	x	x		x		x		x	x	
	The Engineering Professional				x	x					x						x	x	x	x
	Work Based Unit	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x

Programme Skills Matrix – HNC Engineering (Electronic Design)

	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**	**D 1**	**D 2**	**D 3**	**D 4**
LEVEL 4	Analytical Methods for Design	x	x					x												
	Business				x	x					x	x				x	x	x	x	x
	Circuit Analysis and Fault Location Techniques	x	x	x		x		x	x	x		x	x	x	x		x			
	Software Design Principles	x	x	x			x		x				x		x		x			
	Electronic Systems Design	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x			
	Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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Programme Skills Matrix – BEng (Hons) Engineering (Manufacturing Management)

	Units	Programme Intended Learning Outcomes																								
		A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	C 1	C 2	C 3	C 4	C 5	C 6	C 7	D 1	D 2	D 3	D 4	D 5	D 6	D 7
LEVEL 6	Advanced Engineering (FL) (20)	x	x				x	x	x		x	x	x		x	x		x	x	x	x	x		x	x	x
	BEng Project (FL) or EPA BEng Project (FL) (40)	x	x	x	X	x	x	x	x		x		x	x	x			x	x	x		x	x	x	x	x
	Innovation and Professional Practice (FL) (20)			x	X	x				x	x									x	x	x	x	x	x	
	Computational Engineering (FL) (20)	x	x				x		x		x		x	x	x	x			x	x		x		x	x	x
	Manufacturing Operations (FL) (20)	x	x					x			x	x	x			x				x	x	x		x	x	x

Programme Skills Matrix – FdEng Engineering (Manufacturing Management)

	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	D 1	D 2	D 3	D 4
LEVEL 5	Industrial Robotics			x	x		x		x		x		x		x		x			
	Major Project	x	x	x	x	x	x	x	x	x	x	x		x		x		x	x	
	Quality Management	x	x		x	x	x	x		x	x				x					
	The Engineering Professional				x	x					x						x	x	x	x
	Work Based Unit	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x

Programme Skills Matrix - HNC Engineering (Manufacturing Management)

	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	D 1	D 2	D 3	D 4
LEVEL 4	Analytical Methods for Manufacturing	x	x					x												
	Business				x	x					x	x				x	x	x	x	x
	Computer Aided Engineering			x		x	x		x					x		x		x	x	x
	Manufacturing Processes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Supply Chain Management	x	x			x	x	x		x	x	x			x	x	x			

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Programme Skills Matrix – FdEng Engineering (Marine Technologies)

	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	D 1	D 2	D 3	D 4
LEVEL 5	Marine Auxiliary Systems	x	x	x		x	x	x	x	x		x	x	x	x			x	x	
	Major Project	x	x	x	x	x	x	x	x	x	x	x		x		x		x	x	
	Quality Management	x	x		x	x	x	x		x	x				x					
	The Engineering Professional				x	x					x						x	x	x	x
	Work Based Unit	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x

Programme Skills Matrix - HNC Engineering (Marine Technologies)

	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	D 1	D 2	D 3	D 4
LEVEL 4	Analytical Methods for Manufacturing	x	x					x												
	Business				x	x					x	x				x	x	x	x	x
	Marine Electrical and Electronic Principles	x	x	x	x	x	x	x	x	x			x	x		x	x			
	Mechanical Design Principles	x	x	x				x		x			x		x				x	x
	Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Supply Chain Management	x	x			x	x	x		x	x	x			x	x	x			

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Appendix A

BEng Engineering (Mechanical Design) INTENDED LEVEL 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 modern engineering technologies and processes for potential application in industry at a professional engineer level; **A2** the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service; **A3** the planning, implementation and presentation of an individual project; **A4** business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects. **A5** the importance and benefit of equality, diversity and inclusion, as well as being able to balance the demands of industry against social and environmental impacts identified in the UNSD Goals.	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, A4); • directed reading (A1, A4, A5); • use of the VLE (A1-A5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (A1-A5); • examination (A1); • 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 outcomes:
B1 approach and implement 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 engineering theory and practice; **B3** evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to complex 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 engineering technologies research and future trends.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (B1-B3, B5); • group exercises (B2, B4); • practical tutorials (B6); • directed reading (B2, B6); • use of the VLE (B1-B6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (B1-B3, B5); • examination (B2); • coursework (B1–B6).
C: Practical skills	The following learning and teaching and assessment strategies and methods

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This programme provides opportunities for students to:	enable students to achieve and to demonstrate the programme learning outcomes:
C1 identify, understand and employ the appropriate analytical models to solve complex 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 engineering design; **C4** critically 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** identify and safely use appropriate laboratory methods; **C7** use modern engineering technologies and tools to establish innovative non-routine engineering solutions and adapt engineering designs.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-C7); • practical tutorials (C2, C3, C6); • seminars (C4); • use of the VLE (C1-C7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-C7); • coursework (C1–C7); • examination (C1).
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 technical and non-technical audiences; **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, D7); • seminars (D1); • 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/FdEng Engineering (Mechanical Design) INTENDED LEVEL OUTCOMES

A: Knowledge and understanding	The following learning and teaching and

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<table>
<tr><td>This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:</td><td>assessment strategies and methods enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 Routine and non-routine design problems and appropriate mathematical skills

A2 Wide range of scientific theories appropriate to design

A3 ITC relevant to advanced engineering design

A4 Professional and ethical responsibilities

A5 Regulatory framework for safe engineering practice

A6 Design techniques for the solution of routine and non-routine problems in the engineering context</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

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

• individual reports (A1-4, A6);
• group reports (A1-A6);
• professional review (A1-A6);
• unseen in-class tests (A1-A2).</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 level learning outcomes:</td></tr>
<tr><td rowspan="2">B1 Use mathematical and scientific techniques in the analysis of routine and non-routine engineering design problems with minimal guidance

B2 Use computer based techniques in the analysis of routine and non-routine engineering design problems with minimal guidance

B3 Analyse routine and non-routine engineering design problems at system, process and component level with minimal guidance

B4 Analyse routine and non-routine engineering design problems relating to balancing of cost, benefit and aesthetics with minimal guidance

B5 Develop new processes or products through the synthesis of ideas and data gathered from a wide range of sources</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1, B3-B4);
• seminars (B1-B5);
• directed reading (B4-B5);
• use of the VLE (B1, B3);
• project (B1-B5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (B1-B5);
• group reports (B1-B5);
• professional review (B1-B4);
• unseen in-class tests (B1, B3).</td></tr>
<tr><td>C: Practical 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 level learning outcomes:</td></tr>
<tr><td>C1 Use appropriate test and measurement equipment for</td><td>Learning and teaching strategies and methods (referring to numbered</td></tr>
</table>

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<table>
<tr><td>experimental laboratory investigation with minimal guidance

C2 Use engineering CAD, CAM and RM software to aid engineering design with minimal guidance

C3 Analyse experimental methods to evaluate the performance of engineering products or systems with minimal guidance

C4 Plan, schedule and execute routine and non-routine projects within an engineering context with minimal guidance</td><td>Intended Learning Outcomes):

• lectures (C3-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C1-C4).

Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• professional review (C1-C4).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td>D1 Operate effectively in commerce or industry in a wide range of different situations with minimal guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with minimal guidance

D3 Communicate effectively through report writing, presentation and debate

D4 Take leadership roles within teams and/or projects in both education and in the workplace</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1-D3);
• seminars (D1-D4);
• use of the VLE (D2-D3);
• project (D1-D4).

Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D2-D4);
• professional review (D1-D4).</td></tr>
</table>

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LEVEL 4/HNC Engineering (Mechanical Design) INTENDED LEVEL OUTCOMES

<table>
<tr><td>A: 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 Routine design problems and appropriate mathematical skills
A2 Major scientific theories appropriate to design

A3 ITC relevant to engineering design

A4 Professional and ethical responsibilities

A5 Regulatory framework for safe engineering practice

A6 Design techniques in the engineering context</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

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

• individual reports (A1-4, A6);
• group reports (A1-A6);
• laboratory reports (A1-A2);
• unseen in-class tests (A1-A2).</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 level learning outcomes:</td></tr>
<tr><td rowspan="2">B1 Use mathematical and scientific techniques in the analysis of routine engineering design problems with guidance

B2 Use computer based techniques in the analysis of routine engineering design problems with guidance

B3 Analyse routine engineering design problems at system, process and component level with guidance

B4 Analyse routine engineering design problems relating to balancing of cost, benefit and aesthetics with guidance

B5 Develop new processes or products through the synthesis of ideas and data gathered from a limited range of sources with guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1-B4);
• seminars (B1-B5);
• directed reading (B4);
• use of the VLE (B1, B3);
• project (B1-B5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (B1-B5);
• group reports (B1-B5);
• laboratory reports (B1-B3);
• unseen in-class tests (B1, B3).</td></tr>
<tr><td>C: Practical 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 level learning outcomes:</td></tr>
</table>

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<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">C1 Use appropriate test and measurement equipment for experimental laboratory investigation with guidance

C2 Use engineering CAD, CAM and RM software to aid engineering design with guidance

C3 Apply experimental methods to evaluate the performance of engineering products or systems with guidance

C4 Plan, schedule and execute routine projects within an engineering context with guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (C1-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C2-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• laboratory reports (C1).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 Operate effectively in commerce or industry in a limited range of different situations with guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with guidance

D3 Communicate through report writing, presentation and debate

D4 Function as part of a team and lead teams where appropriate in either a work or education based environment</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1, D3);
• seminars (D1-D4);
• use of the VLE (D3);
• project (D1-D4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D2-D4);
• laboratory reports (D3-D4).</td></tr>
</table>

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Appendix B
BEng Engineering (Electronic Design) INTENDED LEVEL 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 modern engineering technologies and processes for potential application in industry at a professional engineer level;

A2 the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service;

A3 the planning, implementation and presentation of an individual project;

A4 business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects;

A5 the importance and benefit of equality, diversity and inclusion, as well as being able to balance the demands of industry against social and environmental impacts identified in the UNSD Goals.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

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

• individual project (A1-A5);
• examinations (A1, A2, A5);
• coursework (A1–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 approach and implement electronic design 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 engineering theory and practice;

B3 evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to complex electronic design engineering problems;

B4 plan and implement electronic design engineering 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 engineering technologies research and future trends.</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• independent research (for project) (B1-B3, B5);
• group exercises (B2, B4);
• practical tutorials (B6);
• directed reading (B2, B6);
• use of the VLE (B1-B6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual project (B1-B3, B5);
• examinations (B2);
• coursework (B1–B6).</td></tr>
<tr><td>C: Practical 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 learning</td></tr>
</table>

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	outcomes:
C1 identify, understand and employ the appropriate analytical models to solve complex engineering 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 electronic design; **C4** critically 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** identify and safely use appropriate laboratory methods; **C7** use modern engineering technologies and tools to establish innovative non-routine electronic design solutions and adapt engineering designs.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1=C3, C6-C7); • practical tutorials (C2, C3, C6); • seminars (C4); • use of the VLE (C1-C7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-C7); • coursework (C1–C7). • Exam (C1, C3, C6)
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 technical and non-technical audiences; **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, D7); • seminars (D1); • 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 (D1, D7); • coursework (D1–D7).

LEVEL 5/FdEng Engineering (Electronic Design) 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 level learning outcomes:

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A1 Routine and non-routine design problems and appropriate mathematical skills **A2** Wide range of scientific theories appropriate to design **A3** ITC relevant to advanced engineering design **A4** Professional and ethical responsibilities **A5** Regulatory framework for safe engineering practice **A6** Design techniques for the solution of routine and non-routine problems in the engineering context	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1-A2, A4-A6); • seminars (A1-A6); • directed reading (A3-A6); • use of the VLE (A1-A2, A4, A6); • project (A1-A6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (A1-4, A6); • group reports (A1-A6); • professional review (A1-A6); • unseen in-class tests (A1-A2).
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 level learning outcomes:
B1 Use mathematical and scientific techniques in the analysis of routine and non-routine engineering design problems with minimal guidance **B2** Use computer based techniques in the analysis of routine and non-routine engineering design problems with minimal guidance **B3** Analyse routine and non-routine engineering design problems at system, process and component level with minimal guidance **B4** Analyse routine and non-routine engineering design problems relating to balancing of cost, benefit and aesthetics with minimal guidance **B5** Develop new processes or products through the synthesis of ideas and data gathered from a wide range of sources	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1-B5); • seminars (B1-B5); • directed reading (B4-B5); • use of the VLE (B1-B3); • project (B1-B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (B1-B5); • group reports (B1-B5); • professional review (B1-B4); • unseen in-class tests (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 level learning outcomes:
C1 Use appropriate test and measurement equipment for experimental laboratory investigation with minimal guidance	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

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<table>
<tr><td rowspan="2">C2 Use engineering CAD, CAM and RM software to aid engineering design with minimal guidance

C3 Analyse experimental methods to evaluate the performance of engineering products or systems with minimal guidance

C4 Plan, schedule and execute routine and non-routine projects within an engineering context with minimal guidance</td><td>• lectures (C1-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C1-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• professional review (C1-C4).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 Operate effectively in commerce or industry in a wide range of different situations with minimal guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with minimal guidance

D3 Communicate effectively through report writing, presentation and debate

D4 Take leadership roles within teams and/or projects in both education and in the workplace</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1-D3);
• seminars (D1-D4);
• use of the VLE (D2-D3);
• project (D1-D4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D2-D4);
• professional review (D1-D4).</td></tr>
</table>

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LEVEL 4/HNC Engineering (Electronic Design) INTENDED LEVEL OUTCOMES

<table>
<tr><td>A: 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 Routine design problems and appropriate mathematical skills
A2 Major scientific theories appropriate to design

A3 ITC relevant to engineering design

A4 Professional and ethical responsibilities

A5 Regulatory framework for safe engineering practice

A6 Design techniques in the engineering context</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (A1-A6);
• seminars (A1-A6);
• directed reading (A4-A6);
• use of the VLE (A1-A4, A6);
• project (A1-A6).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (A1-4, A6);
• group reports (A1-A6);
• laboratory reports (A1-A2);
• unseen in-class tests (A1-A2).</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 level learning outcomes:</td></tr>
<tr><td rowspan="2">B1 Use mathematical and scientific techniques in the analysis of routine engineering design problems with guidance

B2 Use computer based techniques in the analysis of routine engineering design problems with guidance

B3 Analyse routine engineering design problems at system, process and component level with guidance

B4 Analyse routine engineering design problems relating to balancing of cost, benefit and aesthetics with guidance

B5 Develop new processes or products through the synthesis of ideas and data gathered from a limited range of sources with guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1-B4);
• seminars (B1-B5);
• directed reading (B4);
• use of the VLE (B1-B3);
• project (B1-B5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (B1-B5);
• group reports (B1-B5);
• laboratory reports (B1-B3);
• unseen in-class tests (B1, B3).</td></tr>
<tr><td>C: Practical 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 level learning outcomes:</td></tr>
</table>

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<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">C1 Use appropriate test and measurement equipment for experimental laboratory investigation with guidance

C2 Use engineering CAD, CAM and RM software to aid engineering design with guidance

C3 Apply experimental methods to evaluate the performance of engineering products or systems with guidance

C4 Plan, schedule and execute routine projects within an engineering context with guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (C1-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C1-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• laboratory reports (C1-C2).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 Operate effectively in commerce or industry in a limited range of different situations with guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with guidance

D3 Communicate through report writing, presentation and debate

D4 Function as part of a team and lead teams where appropriate in either a work or education based environment</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1, D3);
• seminars (D1-D4);
• use of the VLE (D3);
• project (D1-D4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D1-D4);
• laboratory reports (D3-D4).</td></tr>
</table>

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Appendix C
BEng Engineering (Manufacturing Management) INTENDED LEVEL 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 modern engineering technologies and processes for potential application in industry at a professional engineer level; **A2** the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service; **A3** the planning, implementation and presentation of an individual project; **A4** business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects; **A5** the importance and benefit of equality, diversity and inclusion, as well as being able to balance the demands of industry against social and environmental impacts identified in the UNSD Goals.	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, A5); • directed reading (A1, A4); • use of the VLE (A1-A5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (A1-A5); • 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 outcomes:
B1 approach and implement 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 engineering theory and practice; **B3** evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to complex engineering problems; **B4** plan and implement manufacturing engineering 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 engineering technologies research and future trends.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (B1-B3, B5); • group exercises (B2, B4); • practical tutorials (B6); • directed reading (B2, B6); • use of the VLE (B1-B6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (B1-B3, 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:

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C1 identify, understand and employ the appropriate analytical models to solve complex engineering 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 engineering design; **C4** critically 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** identify and safely use appropriate laboratory methods; **C7** use modern engineering technologies and tools to establish innovative non-routine engineering solutions and adapt engineering designs.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-C7); • practical tutorials (C2, C3, C6); • seminars (C4); • use of the VLE (C1-C7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-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 technical and non-technical audiences; **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, D7); • seminars (D1); • 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); • coursework (D1–D7).

LEVEL 5/FdEng Engineering (Manufacturing Management) INTENDED LEVEL OUTCOMES

A: Knowledge and understanding	The following learning and teaching and assessment strategies and methods

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<table>
<tr><td>This programme provides opportunities for students to develop and demonstrate knowledge and understanding of:</td><td>enable students to achieve and to demonstrate the level learning outcomes:</td></tr>
<tr><td rowspan="2">A1 Routine and non-routine manufacturing and manufacturing management problems and appropriate mathematical skills

A2 Wide range of scientific theories appropriate to manufacturing

A3 ITC relevant to advanced manufacturing and manufacturing management

A4 Professional and ethical responsibilities

A5 Regulatory framework for safe engineering practice

A6 Manufacturing and manufacturing management techniques for the solution of routine and non-routine problems in the engineering context</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

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

• individual reports (A1-4, A6);
• group reports (A1-A6);
• professional review (A1-A6);
• unseen in-class tests (A1-A2).</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 level learning outcomes:</td></tr>
<tr><td rowspan="2">B1 Use mathematical and scientific techniques in the analysis of routine and non-routine manufacturing and manufacturing management problems with minimal guidance

B2 Use computer based techniques in the analysis of routine and non-routine manufacturing and manufacturing management problems with minimal guidance

B3 Analyse routine and non-routine manufacturing and manufacturing management problems at system, process and component level with minimal guidance

B4 Analyse routine and non-routine manufacturing and manufacturing management problems relating to balancing of cost, benefit and aesthetics with minimal guidance

B5 Develop new processes or products through the synthesis of ideas and data gathered from a wide range of sources</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (B1, B3-B4);
• seminars (B1-B5);
• directed reading (B4-B5);
• use of the VLE (B1, B3);
• project (B1-B5).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (B1-B5);
• group reports (B1-B5);
• professional review (B1-B4);
• unseen in-class tests (B1, B3).</td></tr>
</table>

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<table>
<tr><td>C: Practical 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">C1 Use appropriate test and measurement equipment for experimental laboratory investigation with minimal guidance

C2 Use engineering CAD, CAM and RM software to aid engineering design with minimal guidance

C3 Analyse experimental methods to evaluate the performance of engineering products or systems with minimal guidance

C4 Plan, schedule and execute routine and non-routine projects within an engineering context with minimal guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (C2-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C1-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• professional review (C1-C4).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 Operate effectively in commerce or industry in a wide range of different situations with minimal guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with minimal guidance

D3 Communicate effectively through report writing, presentation and debate

D4 Take leadership roles within teams and/or projects in both education and in the workplace</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1-D3);
• seminars (D1-D4);
• use of the VLE (D2-D3);
• project (D1-D4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D2-D4);
• professional review (D1-D4).</td></tr>
</table>

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LEVEL 4/HNC Engineering (Manufacturing Management) 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 level learning outcomes:
A1 Routine manufacturing and manufacturing management problems and appropriate mathematical skills **A2** Major scientific theories appropriate to manufacturing and manufacturing management **A3** ITC relevant to manufacturing and manufacturing management **A4** Professional and ethical responsibilities **A5** Regulatory framework for safe engineering practice **A6** Manufacturing and manufacturing management techniques in the engineering context	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1-A6); • seminars (A1-A6); • directed reading (A2, A4-A6); • use of the VLE (A1-A2, A4, A6); • project (A1-A6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (A1-4, A6); • group reports (A1-A6); • laboratory reports (A1-A2); • unseen in-class tests (A1-A2).
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 level learning outcomes:
B1 Use mathematical and scientific techniques in the analysis of routine manufacturing and manufacturing management problems with guidance **B2** Use computer based techniques in the analysis of routine manufacturing and manufacturing management problems with guidance **B3** Analyse routine manufacturing and manufacturing management problems at system, process and component level with guidance **B4** Analyse routine manufacturing and manufacturing management problems relating to balancing of cost, benefit and aesthetics with guidance **B5** Develop new processes or products through the synthesis of ideas and data gathered from a limited range of sources with guidance	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1-B4); • seminars (B1-B5); • directed reading (B4); • use of the VLE (B1, B3); • project (B1-B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (B1-B5); • group reports (B1-B5); • laboratory reports (B1-B3); • unseen in-class tests (B1, B3).

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<table>
<tr><td>C: Practical 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">C1 Use appropriate test and measurement equipment for experimental laboratory investigation with guidance

C2 Use engineering CAD, CAM and RM software to aid engineering manufacturing and manufacturing management with guidance

C3 Apply experimental methods to evaluate the performance of engineering products or systems with guidance

C4 Plan, schedule and execute routine projects within an engineering context with guidance</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (C1-C4);
• seminars (C1-C4);
• use of the VLE (C4);
• project (C2-C4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (C1-C4);
• group reports (C2, C4);
• laboratory reports (C1).</td></tr>
<tr><td>D: Transferable 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 level learning outcomes:</td></tr>
<tr><td rowspan="2">D1 Operate effectively in commerce or industry in a limited range of different situations with guidance

D2 Analyse the outcomes of actions taken and reflect upon their effects with guidance

D3 Communicate through report writing, presentation and debate

D4 Function as part of a team and lead teams where appropriate in either a work or education based environment</td><td>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):

• lectures (D1, D3);
• seminars (D1-D4);
• use of the VLE (D3);
• project (D1-D4).</td></tr>
<tr><td>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):

• individual reports (D1-D4);
• group reports (D2-D4);
• laboratory reports (D3-D4).</td></tr>
</table>

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Appendix D
BEng Engineering INTENDED LEVEL 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 modern engineering technologies and processes for potential application in industry at a professional engineer level; **A2** the appropriate analytical and/or computer tools for efficiently and effectively predicting performance in-service; **A3** the planning, implementation and presentation of an individual project; **A4** business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects. **A5** the importance and benefit of equality, diversity and inclusion, as well as being able to balance the demands of industry against social and environmental impacts identified in the UNSD Goals.	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, A5); • directed reading (A1, A4); • use of the VLE (A1-A5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (A1-A5); • examinations (A1); • 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 outcomes:
B1 approach and implement 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 engineering theory and practice; **B3** evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to complex engineering problems; **B4** plan and implement 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 engineering technologies research and future trends.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • independent research (for project) (B1-BB3, B5); • group exercises (B2, B4); • practical tutorials (B6); • directed reading (B2, B6); • use of the VLE (B1-B6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (B1-BB3, B5); • examinations (B2); • 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	Learning and teaching strategies and

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analytical models to solve complex 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 engineering design; **C4** critically 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** identify and safely use appropriate laboratory methods; **C7** use modern engineering technologies and tools to establish innovative non-routine engineering solutions and adapt engineering designs.	methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-C7); • practical tutorials (C2, C3, C6); • seminars (C4); • use of the VLE (C1-C7). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual project (C1-C3, C6-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 technical and non-technical audiences; **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, D7); • seminars (D1); • 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/FdEng Engineering (Marine Technologies) 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 level learning

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	outcomes:
A1 Routine and non-routine marine technological problems and appropriate mathematical skills **A2** Wide range of scientific theories appropriate to marine technologies **A3** ITC relevant to advanced marine technologies **A4** Professional and ethical responsibilities **A5** Regulatory framework for safe engineering practice **A6** Marine techniques for the solution of routine and non-routine problems in the technological context	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1-A6); • seminars (A1-A6); • directed reading (A2-A6); • use of the VLE (A1-A2, A4, A6); • project (A1-A6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (A1-4, A6); • group reports (A1-A3, A5-6); • professional review (A1-A6); • unseen in-class tests (A1-A2).
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 level learning outcomes:
B1 Use mathematical and scientific techniques in the analysis of routine and non-routine marine technological problems with minimal guidance **B2** Use computer based techniques in the analysis of routine and non-routine marine technological problems with minimal guidance **B3** Analyse routine and non-routine marine technological problems at system, process and component level with minimal guidance **B4** Analyse routine and non-routine marine technological problems relating to balancing of cost, benefit and aesthetics with minimal guidance **B5** Develop new processes or products through the synthesis of ideas and data gathered from a wide range of sources	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1-B4); • seminars (B1-B5); • directed reading (B4-B5); • use of the VLE (B1, B3); • project (B1-B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (B1-B5); • group reports (B1-B5); • professional review (B1-B4); • unseen in-class tests (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 level learning outcomes:
C1 Use appropriate test and measurement equipment for experimental laboratory investigation with minimal guidance **C2** Use engineering CAD, CAM and RM software to aid	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C3-C4); • seminars (C1-C4);

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marine technologies with minimal guidance **C3** Analyse experimental methods to evaluate the performance of marine products or systems with minimal guidance **C4** Plan, schedule and execute routine and non-routine projects within a marine technologies context with minimal guidance	• use of the VLE (C4); • project (C1-C4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (C1-C4); • group reports (C1-C2, C4); • professional review (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 level learning outcomes:
D1 Operate effectively in commerce or industry in a wide range of different situations with minimal guidance **D2** Analyse the outcomes of actions taken and reflect upon their effects with minimal guidance **D3** Communicate effectively through report writing, presentation and debate **D4** Take leadership roles within teams and/or projects in both education and in the workplace	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1-D3); • seminars (D1-D4); • use of the VLE (D2-D3); • project (D1-D4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (D1-D4); • group reports (D1-D3); • professional review (D1-D4).

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LEVEL 4/HNC Engineering (Marine Technologies) 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 level learning outcomes:
A1 Routine marine technological problems and appropriate mathematical skills **A2** Major scientific theories appropriate to marine technologies **A3** ITC relevant to marine technologies **A4** Professional and ethical responsibilities **A5** Regulatory framework for safe engineering practice **A6** Marine techniques in the engineering context	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (A1-A6); • seminars (A1-A6); • directed reading (A2, A4-A6); • use of the VLE (A1-A2, A4, A6); • project (A1-A6). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (A1-A6); • group reports (A1, A3); • laboratory reports (A1-A2); • unseen in-class tests (A1-A2).
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 level learning outcomes:
B1 Use mathematical and scientific techniques in the analysis of routine marine technological problems with guidance **B2** Use computer based techniques in the analysis of routine marine technological problems with guidance **B3** Analyse routine marine technological problems at system, process and component level with guidance **B4** Analyse routine marine technological problems relating to balancing of cost, benefit and aesthetics with guidance **B5** Develop new processes or products through the synthesis of ideas and data gathered from a limited range of sources with guidance	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (B1-B4); • seminars (B1-B5); • directed reading (B4); • use of the VLE (B1, B3); • project (B1-B5). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (B1-B5); • group reports (B1-B5); • laboratory reports (B1-B3); • unseen in-class tests (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 level learning outcomes:

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C1 Use appropriate test and measurement equipment for experimental laboratory investigation with guidance **C2** Use engineering CAD, CAM and RM software to aid marine technologies with guidance **C3** Apply experimental methods to evaluate the performance of marine products or systems with guidance **C4** Plan, schedule and execute routine projects within a marine technologies context with guidance	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (C1-C4); • seminars (C1-C4); • use of the VLE (C4); • project (C2-C4). Assessment strategies and methods: • individual reports (C1-C4); • group reports (C2, C4); • laboratory reports (C1).
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 level learning outcomes:
D1 Operate effectively in commerce or industry in a limited range of different situations with guidance **D2** Analyse the outcomes of actions taken and reflect upon their effects with guidance **D3** Communicate through report writing, presentation and debate **D4** Function as part of a team and lead teams where appropriate in either a work or education based environment	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): • lectures (D1, D3); • seminars (D1-D4); • use of the VLE (D3); • project (D1-D4). Assessment strategies and methods (referring to numbered Intended Learning Outcomes): • individual reports (D1-D4); • group reports (D2-D4); • laboratory reports (D3-D4).

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APPENDIX E

PSRB Mapping: BEng (Hons) Engineering – Partial CEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																				
Partial CEng		AHEP4: Level >>	6	6	6	6	6	6	6	6	6	4	6	6	6	6	6	5	6	4
Programme Title:	**BEng (Hons) Engineering**																			
	Module code	**Compulsory**	**Science and Maths**	**Engineering Analysis**			**Design and Innovation**		**The Engineer and Society**					**Engineering Practice**						
			C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Total Count	172		16	18	19	8	12	15	6	5	7	2	5	12	14	5	6	10	8	4
Core Count	66		5	3	4	5	4	3	3	5	5	2	4	2	2	3	5	1	6	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering				X									X	X			X		
	Design Principles		X	X	X		X	X	X						X			X		
	Mechanical Design Principles		X		X									X	X					
	Supply Chain Management			X					X				X					X		
	Manufacturing Processes		X	X			X	X						X	X					
	Circuit Analysis and Fault Location Techniques		X	X	X			X						X	X					
	Software Design Principles			X	X		X	X										X		
	Electronic Systems Design		X	X	X		X	X						X	X			X		
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Design Applications		X	X	X		X	X	X						X			X	X	
	Mechanical Design Applications		X	X	X									X						
	Quality Management			X	X	X		X			X					X				
	Industrial Robotics		X	X	X		X	X			X			X	X			X		
	Applied Software in Engineering			X	X		X	X							X			X		
	Electronic Design Applications		X	X	X		X	X						X	X				X	
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Adv. Stress & Vibration		X	X	X									X						
	Computational Engineering		X	X	X	X		X												
	Manufacturing Operations														X	X	X			
	Mechatronics			X	X	X		X						X	X			X		

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PSRB Mapping: BEng (Hons) Engineering (Mechanical Design) – Partial CEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																			
Partial CEng		AHEP4: Level >>	6	6	6	6	6	6	6	6	6	4	6	6	6	6	6	5	6	4
Programme Title:	**BEng (Hons) Engineering (Mechanical Design)**																			
	Module code	**Compulsory**	**Science and Maths**	**Engineering Analysis**			**Design and Innovation**		**The Engineer and Society**					**Engineering Practice**						
			C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**C14**	**C15**	**C16**	**C17**	**C18**
Total Count	104		11	8	11	6	6	6	5	5	5	2	4	6	6	3	5	4	7	4
Core Count	104		11	8	11	6	6	6	5	5	5	2	4	6	6	3	5	4	7	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering	x			X									X	X			X		
	Design Principles	x	X	X	X		X	X	X						X			X		
	Mechanical Design Principles	x	X		X									X	X					
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Design Applications	x	X	X	X		X	X	X						X			X	X	
	Mechanical Design Applications	x	X	X	X									X						
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Adv. Stress & Vibration	x	X	X	X									X						
	Computational Engineering	x	X	X	X	X		X												

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PSRB Mapping: BEng Engineering (Electronic Design) – Partial CEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																			
Partial CEng		AHEP4: Level >>	6	6	6	6	6	6	6	6	6	4	6	6	6	6	6	5	6	4
Programme Title:	BEng (Hons) Engineering (Electronic Design)																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Total Count	107		8	9	10	6	8	9	3	5	5	2	4	6	7	4	6	4	7	4
Core Count	107		8	9	10	6	8	9	3	5	5	2	4	6	7	4	6	4	7	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Circuit Analysis and Fault Location Techniques	x	X	X	X			X						X	X					
	Software Design Principles	x		X	X		X	X										X		
	Electronic Systems Design	x	X	X	X		X	X						X	X			X		
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Applied Software in Engineering	x		X	X		X	X							X			X		
	Electronic Design Applications	x	X	X	X		X	X						X	X				X	
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Manufacturing Operations	x													X	X	X			
	Mechatronics	x		X	X	X		X						X						

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PSRB Mapping: BEng Engineering (Manufacturing Management) – Partial CEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																			
Partial CEng		AHEP4: Level >>	6	6	6	6	6	6	6	6	6	4	6	6	6	6	6	5	6	4
Programme Title:	BEng Engineering (Hons) (Manufacturing Management)																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Total Count	103		8	8	8	7	6	7	4	5	7	2	5	5	6	5	6	4	6	4
Core Count	103		8	8	8	7	6	7	4	5	7	2	5	5	6	5	6	4	6	4
Year 1	*Analytical Methods for Manufacturing*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering	x			X									X	X			X		
	Supply Chain Management	x		X					X				X					X		
	Manufacturing Processes	x	X	X			X	X						X	X					
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Quality Management	x		X	X	X		X			X					X				
	Industrial Robotics	x	X	X	X		X	X			X			X	X			X		
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Computational Engineering	x	X	X	X	X		X												
	Manufacturing Operations	x													X	X	X			

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PSRB Mapping: BEng (Hons) Engineering – IEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																			
IEng		AHEP4: Level >>	6	6	6	6	6	6	5	6	6	4	5	5	5	5	6	5	4	4
Programme Title:	BEng (Hons) Engineering																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18
Total Count	172		16	18	19	8	12	15	6	5	7	2	5	12	14	5	6	10	8	4
Core Count	66		5	3	4	5	4	3	3	5	5	2	4	2	2	3	5	1	6	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering				X									X	X			X		
	Design Principles		X	X	X		X	X	X						X			X		
	Mechanical Design Principles		X		X									X	X					
	Supply Chain Management			X					X				X					X		
	Manufacturing Processes		X	X			X	X						X	X					
	Circuit Analysis and Fault Location Techniques		X	X	X			X						X	X					
	Computer and Internet Technologies			X	X		X	X										X		
	Electronic Systems Design		X	X	X		X	X						X	X			X		
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Design Applications		X	X	X		X	X	X						X			X	X	
	Mechanical Design Applications		X	X	X									X						
	Quality Management			X	X	X		X			X					X				
	Industrial Robotics		X	X	X		X	X			X			X	X			X		
	Applied Software in Engineering			X	X		X	X							X			X		
	Electronic Design Applications		X	X	X		X	X						X	X				X	
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Adv. Stress & Vibration		X	X	X									X						
	Computational Engineering		X	X	X	X		X												
	Manufacturing Operations														X	X	X			
	Mechatronics			X	X	X		X						X	X			X		

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PSRB Mapping: BEng (Hons) Engineering (Mechanical Design) – IEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																				
IEng		AHEP4: Level >>	6	6	6	6	6	6	5	6	6	4	5	5	5	5	6	5	4	4
Programme Title:	BEng (Hons) Engineering (Mechanical Design)																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18
Total Count	104		11	8	11	6	6	6	5	5	5	2	4	6	6	3	5	4	7	4
Core Count	104		11	8	11	6	6	6	5	5	5	2	4	6	6	3	5	4	7	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering	x			X									X	X			X		
	Design Principles	x	X	X	X		X	X	X						X			X		
	Mechanical Design Principles	x	X		X									X	X					
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Unit	x	X	X	X			X					X	X	X	X	X	X	X	X
	Design Applications	x	X	X	X		X	X	X						X			X	X	
	Mechanical Design Applications	x	X	X	X									X						
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Adv. Stress & Vibration	x	X	X	X									X						
	Computational Engineering	x	X	X	X	X		X												

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PSRB Mapping: BEng Engineering (Electronic Design) – IEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																				
IEng		AHEP4: Level >>	6	6	6	6	6	6	5	6	6	4	5	5	5	5	6	5	4	4
Programme Title:	BEng (Hons) Engineering (Electronic Design)																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18
Total Count	107		8	9	10	6	8	9	3	5	5	2	4	6	7	4	6	4	7	4
Core Count	107		8	9	10	6	8	9	3	5	5	2	4	6	7	4	6	4	7	4
Year 1	*Analytical Methods for Design*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Circuit Analysis and Fault Location Techniques	x	X	X	X			X						X	X					
	Software Design Principles	x		X	X		X	X										X		
	Electronic Systems Design	x	X	X	X		X	X						X	X			X		
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Project	x	X	X	X			X					X	X	X	X	X	X	X	X
	Applied Software in Engineering	x		X	X		X	X							X			X		
	Electronic Design Applications	x	X	X	X		X	X						X	X				X	
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Manufacturing Operations	x													X	X	X			
	Mechatronics	x		X	X	X		X						X						

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PSRB Mapping: BEng Engineering (Manufacturing Management) – IEng

EAB/ACC2/C: Output Standards Matrix (for use with AHEP 4.0)																			
IEng		AHEP4: Level >>	6	6	6	6	6	6	5	6	6	4	5	5	5	5	6	5	4	4
Programme Title:	BEng Engineering (Hons) (Manufacturing Management)																			
	Module code	Compulsory	Science and Maths	Engineering Analysis			Design and Innovation		The Engineer and Society					Engineering Practice						
			B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18
Total Count	103		8	8	8	7	6	7	4	5	7	2	5	5	6	5	6	4	6	4
Core Count	103		8	8	8	7	6	7	4	5	7	2	5	5	6	5	6	4	6	4
Year 1	*Analytical Methods for Manufacturing*	x	X		X															
	Business (and Project Management)	x	X						X	X	X	X	X							
	Project	x		X		X	X	X			X					X	X		X	X
	Computer Aided Engineering	x			X									X	X			X		
	Supply Chain Management	x		X					X				X					X		
	Manufacturing Processes	x	X	X			X	X						X	X					
Year 2	*Major Project*	x		X	X	X	X	X	X	X	X		X				X		X	
	The Engineering Professional	x				X				X									X	X
	Work Based Project	x	X	X	X			X					X	X	X	X	X	X	X	X
	Quality Management	x		X	X	X		X			X					X				
	Industrial Robotics	x	X	X	X		X	X			X			X	X			X		
Year 3	*Innovation and Professional Practice*	x					X			X	X		X			X	X			
	Advanced Engineering	x	X			X									X				X	
	BEng Project	x	X		X	X	X		X	X	X	X		X			X		X	X
	Computational Engineering	x	X	X	X	X		X												
	Manufacturing Operations	x													X	X	X			

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Appendix F

Product Design & Development Engineer Degree Apprenticeship Standard – Knowledge, Skills and Behaviours

Programme Name:			Engineering (Mechanical Design)																		
			Module numbers/names (where the output criteria statements are addressed)																		
			Analytical Methods for Design	Business	Project	Computer Aided Engineering	Design Principles	Mechanical Design Principle	Major Project	The Engineering Professional	Work Based Unit	Design Applications	Mechanical Design Application	Innovation & Professional Practice	Advanced Engineering	BEng Project	Computational Engineering	Advanced Stress and Vibration			
Count of Learning Outcomes		**L4 - HNC, L5 - FdEng, L6 - BEng**	4	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	**Count of Learning Outcomes per level**		
Total Count	**Core Count**	**Core Module (Y/N)?**	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	**Level 4**	**Level 5**	**Level 6**
7	7	Knowledge	**K1**: Safety, environmental, sustainability and security standards associated with product, component or system design, development or modifications and the environments in which they reside.		x	x		x		x			x		x		x			3	2	2
6	6		**K2**: Hazardous environments and safe systems of work including the impact on the design specification, product, component, system development or modification.			x		x		x			x		x		x			2	2	2
5	5		**K3**: Constraints or limitations when designing, developing, testing or modifying a product, component or system.			x		x		x			x				x			2	2	1
2	2		**K4**: Principles and applications of thermodynamics and fluid dynamics relevant to product design or development.						x					x						1	1	0
5	5		**K5**: Principles and applications of mechanical dynamic systems relevant to product design or development.					x	x				x						x	2	2	1

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4	4		**K6**: Factors that determine material selection relevant to the appropriate industry sector and product, component or system being designed or developed.					x	x				x				x			2	1	1
3	3		**K7**: Product design and development life cycle stages.					x					x				x			1	1	1
5	5		**K8**: Principles of mathematics and scientific methods including analytical techniques required to perform the product design or development engineer role such as evaluating statistical data, complex numbers and matrices.	x					x					x				x	x	2	1	2
3	2		**K9**: Principles and applications of electrical, electronic systems and components and digital engineering relevant to product design or development such as analogue to digital conversion, semiconductor devices and circuits, sensors and electric motors.					x					x							1	1	0
5	5		**K10**: Formats for collecting, presenting and storing data including how to select the best method for conveying complex information, and how to analyse the benefits and risks of each methodology.						x		x			x			x	x		1	2	2
5	5		**K11**: Commercial nature of projects and how any changes or delays impact on the business.		x					x		x			x		x			1	2	2
6	6		**K12**: Methods or techniques used for improving or enhancing the safety, reliability, quality, performance and sustainability of products, systems or components such as lean or six sigma.		x	x				x		x			x	x				2	2	2
8	8		**K13**: Data acquisition and troubleshooting techniques for diagnosing problems, faults or establishing performance characteristics, supporting improvement opportunities and potential design modifications to systems, products or components.			x			x	x		x		x			x	x	x	2	3	3
3	3		**K14**: Ways to access personal and professional development and to maintain vocational currency.								x	x			x					0	2	1
7	7		**K15**: Specific organisational processes used in the research, design and development products, components or systems and how they can be utilised to optimise factors such as safety, efficiency, performance, productivity and sustainability.		x			x		x		x	x			x	x			2	3	2

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3	3		**K16**: Quality management and assurance processes.									x			x		x			0	1	2
3	3		**K17**: Management of change (MOC) processes of requesting, determining viability, planning, implementing and evaluating changes to a product, system or component. Understand the importance of strict adherence to MOC, and know the limitations when providing MOC approval.							x		x			x					0	2	1
2	2		**K18**: Principles of Computer Aided Design (CAD) tools and Computer Aided Manufacture (CAM) packages.				x											x		1	0	1
3	3		**K19**: Principles of simulation tools such as Augmented Reality (AR), Finite Element Analysis (FEA) or assembly simulation with Computer Aided Engineering (CAE) tools.				x										x	x		1	0	2
5	5		**K20**: Project management method(s) and principles of how to record project or programmes of work outcomes and metrics to track progress.			x				x		x			x		x			1	2	2
3	3		**K21**: How advances in technology could impact organisations in the future including factors such as the mechanical and electrical integration, digitalisation, manufacturing systems and in supporting the sustainability agenda such as Industry 4.0.		x						x					x				1	1	1
8	8		**K22**: Workload or time management techniques used to ensure that personal and team objectives are achieved.		x	x		x		x		x	x		x		x			3	3	2
4	4		**K23**: Different applications and limitations of computer based software system or packages used in the design and development process.				x		x					x				x		2	1	1
4	4		**K24**: Benefits of working collaboratively with colleagues and sharing best practice to support business quality and performance measures or issues.					x				x	x		x					1	2	1
4	4		**K25**: Manufacturing methods used to support the design or development process from concept to production ready products, components or systems.					x				x	x				x			1	2	1
6	6	Skills	**S1**: Translate conceptual ideas or technical requirements into developmental outcomes or operational designs or specifications for products, systems or components to solve				x	x		x		x	x				x			2	3	1

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			engineering challenges such as compliance, technology, technical or physical challenges.																				
6	6		**S2**: Select, use and apply approved problem-solving methods to solve complex problems and determine appropriate solutions or actions such as Define, Measure, Analyse, Improve, and Control (DMAIC), Failure Mode Effects Analysis (FMEA) or Plan-Do-Check-Act (PDCA).		x					x		x	x				x	x		1	3	2
4	4		**S3**: Collate and use a range of data sources and supporting documentation to support projects.			x				x	x						x			1	2	1
7	7		**S4**: Interpret and produce technical documentation such as schematic and circuit diagrams, engineering drawings or 3D CAD models, simulation models, project plans, engineering reports, test reports, fault reports or data analytics using company documentation systems and guidelines.			x	x	x		x		x	x				x			3	3	1
5	5		**S5**: Observe, record and draw accurate and auditable conclusions from data or developmental or test evidence.						x			x		x				x	x	1	2	2
4	4		**S6**: Manage assigned projects or programmes of work to meet the required specification, taking into account factors such as resource requirements, safety, quality, cost and performance or sustainability criteria. Apply processes for project or programme management including outcomes such as escalation, audit or risk management and risk mitigation.			x				x					x		x			1	1	2
6	6		**S7**: Comply with statutory and organisational safety standards and requirements, supporting safety risk assessments and mitigate any risks identified within the design, manufacture, development or test activity.		x	x				x		x			x		x			2	2	2
4	4		**S8**: Identify resources, such as digital tools or technologies, human, equipment, materials or data, to complete design and development projects or programmes of work.			x				x		x					x			1	2	1
4	4		**S9**: Create and manage a project or work programme plan and develop activities in a logical process embedding mechanisms for adapting to changing circumstances or requirements.			x				x		x					x			1	2	1

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3	3		**S10**: Demonstrate leadership when undertaking product design, development, modification or update engineering activities.							x		x					x			0	2	1
4	4		**S11**: Identify and rectify faults, inaccuracies, discrepancies or unexpected results during the design or development process, which may impact the quality and reliability of the product, system or component.							x		x			x		x			0	2	2
4	4		**S12**: Ensure that all systems or equipment has been correctly configured and checked for safe operation before use.				x		x			x			x					2	1	1
9	9		**S13**: Evaluate engineering designs, development or modification options.			x	x	x		x		x	x			x	x		x	3	3	3
2	2		**S14**: Identify areas for improvement and lead continuous improvement activities in the operation and performance of the product, system or component.									x					x			0	1	1
4	4		**S15**: Complete project documentation checks throughout the activity and report non-conformances.			x				x		x					x			1	2	1
1	1	Behaviours	**B1**: Champions a healthy and safe working environment.									x								0	1	0
2	2		**B2**: Has a quality and compliance mindset.							x		x								0	2	0
2	2		**B3**: Uses independent judgement and takes responsibility for decisions.							x		x								0	2	0
2	2		**B4**: Collaborate and promote teamwork across disciplines.					x				x								1	1	0
1	1		**B5**: Is agile, resilient and motivated when faced with change.									x								0	1	0
1	1		**B6**: Builds relationships in a respectful, collaborative and open and honest way.									x								0	1	0
2	2		**B7**: Committed to continuous professional development.								x	x								0	2	0
2	2		**B8**: Committed to upholding the organisations values, ethics, goals, codes of practice, statutory requirements and standards.		x							x								1	1	0
2	2		**B9**: Leads by example being an advocate for change and sustainable approaches.							x		x								0	2	0

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Programme Name:			Engineering (Marine Technologies)																					
			Module numbers/names (where the output criteria statements are addressed)																					
			Analytical Methods for Manufacturing	Business	Project	Marine Electrical and Electronic Principles	Supply Chain Management	Mechanical Design Principle	Major Project	The Engineering Professional	Work Based Unit	Marine Auxiliary Systems	Quality Management	Innovation & Professional Practice	Advanced Engineering	BEng Project	Computational Engineering	Advanced Stress and Vibration	Mechatronics	Manufacturing Operations			
Count of Learning Outcomes		**L4 - HNC, L5 - FdEng, L6 - BEng**	4	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6	6	6	**Count of Learning Outcomes per level**		
Total Count	**Core Count**	**Core Module (Y/N)?**	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	**Level 4**	**Level 5**	**Level 6**
8	7	Knowledge	**K1**: Safety, environmental, sustainability and security standards associated with product, component or system design, development or modifications and the environments in which they reside.	x	x		x		x			x		x		x			x		3	2	3
7	5		**K2**: Hazardous environments and safe systems of work including the impact on the design specification, product, component, system development or modification.		x	x			x					x		x			x	x	2	1	4
5	4		**K3**: Constraints or limitations when designing, developing, testing or modifying a product, component or system.		x				x			x				x			x		1	2	2
2	2		**K4**: Principles and applications of thermodynamics and fluid dynamics relevant to product design or development.					x				x									1	1	0
3	2		**K5**: Principles and applications of mechanical dynamic systems relevant to product design or development.					x				x						x			1	1	1
4	3		**K6**: Factors that determine material selection relevant to the					x					x			x				x	1	1	2

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			appropriate industry sector and product, component or system being designed or developed.																					
4	3		**K7**: Product design and development life cycle stages.					x						x			x			x		1	1	2
6	4		**K8**: Principles of mathematics and scientific methods including analytical techniques required to perform the product design or development engineer role such as evaluating statistical data, complex numbers and matrices.	x			x		x				x					x	x			3	1	2
3	2		**K9**: Principles and applications of electrical, electronic systems and components and digital engineering relevant to product design or development such as analogue to digital conversion, semiconductor devices and circuits, sensors and electric motors.				x						x							x		1	1	1
5	3		**K10**: Formats for collecting, presenting and storing data including how to select the best method for conveying complex information, and how to analyse the benefits and risks of each methodology.						x		x						x	x			x	1	1	3
7	7		**K11**: Commercial nature of projects and how any changes or delays impact on the business.		x			x		x		x										2	3	2
10	9		**K12**: Methods or techniques used for improving or enhancing the safety, reliability, quality, performance and sustainability of products, systems or components such as lean or six sigma.		x	x	x	x		x		x		x	x	x					x	4	3	3
11	8		**K13**: Data acquisition and troubleshooting techniques for diagnosing problems, faults or establishing performance characteristics, supporting improvement opportunities and potential design modifications to systems, products or components.			x	x	x	x	x		x	x				x	x	x	x		4	3	4

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3	3		**K14**: Ways to access personal and professional development and to maintain vocational currency.								x	x			x							0	2	1
6	5		**K15**: Specific organisational processes used in the research, design and development products, components or systems and how they can be utilised to optimise factors such as safety, efficiency, performance, productivity and sustainability.		x					x		x				x	x				x	1	2	3
6	5		**K16**: Quality management and assurance processes.					x				x		x	x		x				x	1	2	3
6	5		**K17**: Management of change (MOC) processes of requesting, determining viability, planning, implementing and evaluating changes to a product, system or component. Understand the importance of strict adherence to MOC, and know the limitations when providing MOC approval.					x		x		x		x	x						x	1	3	2
2	1		**K18**: Principles of Computer Aided Design (CAD) tools and Computer Aided Manufacture (CAM) packages.				x												x				1	0	1
3	2		**K19**: Principles of simulation tools such as Augmented Reality (AR), Finite Element Analysis (FEA) or assembly simulation with Computer Aided Engineering (CAE) tools.				x											x	x				1	0	2
5	5		**K20**: Project management method(s) and principles of how to record project or programmes of work outcomes and metrics to track progress.			x				x		x			x		x					1	2	2
5	5		**K21**: How advances in technology could impact organisations in the future including factors such as the mechanical and electrical integration, digitalisation, manufacturing systems and in supporting the sustainability agenda such as Industry 4.0.		x			x			x			x		x						2	2	1

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8	7		**K22**: Workload or time management techniques used to ensure that personal and team objectives are achieved.		x	x		x		x		x			x		x				x	3	2	3
4	2		**K23**: Different applications and limitations of computer based software system or packages used in the design and development process.				x		x									x		x		2	0	2
4	3		**K24**: Benefits of working collaboratively with colleagues and sharing best practice to support business quality and performance measures or issues.									x		x	x						x	0	2	2
5	4		**K25**: Manufacturing methods used to support the design or development process from concept to production ready products, components or systems.					x				x		x			x				x	1	2	2
6	4	Skills	**S1**: Translate conceptual ideas or technical requirements into developmental outcomes or operational designs or specifications for products, systems or components to solve engineering challenges such as compliance, technology, technical or physical challenges.							x		x	x				x			x	x	0	3	3
7	6		**S2**: Select, use and apply approved problem-solving methods to solve complex problems and determine appropriate solutions or actions such as Define, Measure, Analyse, Improve, and Control (DMAIC), Failure Mode Effects Analysis (FMEA) or Plan-Do-Check-Act (PDCA).		x			x		x		x		x			x	x				2	3	2
4	4		**S3**: Collate and use a range of data sources and supporting documentation to support projects.			x				x	x						x					1	2	1
7	6		**S4**: Interpret and produce technical documentation such as schematic and circuit diagrams, engineering drawings or 3D CAD models,			x	x			x		x	x				x			x		2	3	2

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			simulation models, project plans, engineering reports, test reports, fault reports or data analytics using company documentation systems and guidelines.																					
7	4		**S5**: Observe, record and draw accurate and auditable conclusions from data or developmental or test evidence.				x	x	x			x						x	x	x		3	1	3
4	4		**S6**: Manage assigned projects or programmes of work to meet the required specification, taking into account factors such as resource requirements, safety, quality, cost and performance or sustainability criteria. Apply processes for project or programme management including outcomes such as escalation, audit or risk management and risk mitigation.			x				x					x		x					1	1	2
7	6		**S7**: Comply with statutory and organisational safety standards and requirements, supporting safety risk assessments and mitigate any risks identified within the design, manufacture, development or test activity.		x	x				x		x			x		x				x	2	2	3
5	4		**S8**: Identify resources, such as digital tools or technologies, human, equipment, materials or data, to complete design and development projects or programmes of work.			x				x		x					x			x		1	2	2
6	4		**S9**: Create and manage a project or work programme plan and develop activities in a logical process embedding mechanisms for adapting to changing circumstances or requirements.			x				x		x					x			x	x	1	2	3
3	3		**S10**: Demonstrate leadership when undertaking product design, development, modification or update engineering activities.							x		x					x					0	2	1

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8	5		**S11**: Identify and rectify faults, inaccuracies, discrepancies or unexpected results during the design or development process, which may impact the quality and reliability of the product, system or component.							x		x		x	x		x		x	x	x	0	3	5
7	5		**S12**: Ensure that all systems or equipment has been correctly configured and checked for safe operation before use.				x		x			x	x		x					x	x	2	2	3
8	6		**S13**: Evaluate engineering designs, development or modification options.			x	x			x		x					x	x		x	x		2	2	4
4	3		**S14**: Identify areas for improvement and lead continuous improvement activities in the operation and performance of the product, system or component.									x		x			x					x	0	2	2
4	4		**S15**: Complete project documentation checks throughout the activity and report non-conformances.			x				x		x					x						1	2	1
1	1	Behaviours	**B1**: Champions a healthy and safe working environment.									x											0	1	0
3	3		**B2**: Has a quality and compliance mindset.							x		x		x									0	3	0
2	2		**B3**: Uses independent judgement and takes responsibility for decisions.							x		x											0	2	0
3	3		**B4**: Collaborate and promote teamwork across disciplines.					x				x		x									1	2	0
1	1		**B5**: Is agile, resilient and motivated when faced with change.									x											0	1	0
1	1		**B6**: Builds relationships in a respectful, collaborative and open and honest way.									x											0	1	0
2	2		**B7**: Committed to continuous professional development.								x	x											0	2	0
2	2		**B8**: Committed to upholding the organisations values, ethics, goals, codes of practice, statutory		x							x											1	1	0

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			requirements and standards.																						
2	2		**B9**: Leads by example being an advocate for change and sustainable approaches.							x		x										0	2	0

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Manufacturing Engineer Degree Apprenticeship Standard – Knowledge, Skills and Behaviours
Please note this standard is under review these KSBs are in old format which is still current until review published.

Academic Knowledge	HNC/FdEng/BEng Engineering (Manufacturing Management)	HNC/FdEng/BEng Engineering (Electronic Design)
Mathematics and Science for Engineers	Analytical Methods for Manufacturing Industrial Robotics	Analytical Methods for Design Electronic Design Application
Materials and Manufacture	Manufacturing Processes Supply Chain Management Quality Management Advanced Engineering Manufacturing Operations (option)	Electrical Systems Design Electronic Design Applications Advanced Engineering
3D Computer Aided Design and Computer Aided Engineering	Computer Aided Engineering Industrial Robotics Computational Engineering	Computer and Internet Technologies Applied Software in Engineering Mechatronics
How to Undertake and Apply Business Led Projects	Project / Major Project Work Based Unit BEng Project	Project / Major Project Work Based Unit BEng Project
Engineering Operations and Business Management	Business and Project Management Work Based Unit Business Development	Business and Project Management Work Based Unit Business Development
Manufacturing Processes	Manufacturing Processes Supply Chain Management Quality Management Manufacturing Operations	Circuit Analysis and Fault Location Techniques Electronic Design Applications Manufacturing Operations
Product Improvement and Engineering Project Management	Project / Major Project Work Based Unit The Engineering Professional BEng Project	Project / Major Project Work Based Unit The Engineering Professional BEng Project

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