Defining characteristics and Learning outcomes – AAQA first edition and AHEP fourth edition

Taken from the Approval and Accreditation of Qualifications and Apprenticeships (AAQA), first edition and the Accreditation of Higher Education Programmes (AHEP) fourth edition

These learning outcomes are taken from AAQA and AHEP, part of the Standard used by the UK engineering profession to assess the competence and commitment of individual engineers and technicians for professional registration. This Standard was developed collaboratively, in consultation with engineers representing the breadth of the profession; from industry, academia and many different disciplines and specialisms.

To download the full AAQA and AHEP documents for free please visit the Engineering Council website: www.engc.org.uk/aaqa

www.engc.org.uk/ahep

About the Engineering Council

The Engineering Council is the UK's regulatory body for the engineering profession. It sets the Standards which need to be met for an individual to become professionally registered.

The Engineering Council licenses engineering institutions (Licensees) to assess individuals for professional registration and assess programmes of learning for approval or accreditation. Licensees carry these tasks out on behalf of the Engineering Council.

It operates under a Royal Charter and is governed by a Board that represents UK engineering institutions as well as individuals from industries and sectors with an interest in the regulation of the profession.

Defining characteristics of approved and accredited programmes

National Certifica	ates/	Higher Natio	nal	Foundation d	legrees and	Bachelors deg	rees and	Bachelors (H	onours)	Masters degre	es other	Integrated Maste	ers (MEng)
Diplomas and eq	uivalent	Certificate a	nd equivalent	t equivalent qualifications		Bachelors (Honours)		degrees (including Top-		than the Integrated Masters		rs degrees accredited for	
qualifications acc	credited or	qualification	s accredited	accredited as	s partially	degrees (inclue	ding Top-up	up degrees) accredited		(MEng) (accredited as		CEng registratio	n
approved as fully	y meeting	as meeting t	he educational	meeting the e	educational	degrees) accre	dited for	as partially m	eeting the	further learnin	g to Masters		
the academic req	quirement	requirement	s for	requirement	for IEng	IEng registration	on	educational r	equirement	level, partially	meeting the		
for EngTech regis	stration	progression	towards	registration (further			for CEng regi	stration	educational re	quirement		
		IEng registra	ation (further	learning to B	achelors level			(further learn	ing to Masters	for CEng)			
		learning to E	Bachelors level	will be requir	ed)			level will be r	equired)				
		will be requi	red)										
ISCED:	Level 3	ISCED:	Level 5	ISCED:	Level 5	ISCED:	Level 6	ISCED:	Level 6	ISCED:	Level 7	ISCED:	Level 7
EQF:	Level 4	EQF:	Level 4/5	EQF:	Level 5	EQF:	Level 6	EQF:	Level 6	EQF:	Level 7	EQF:	Level 7
National Certificate	es/	Higher Natior	nal Certificates	Foundation de	egrees or	Bachelors degre	ees and	Bachelors (Ho	nours)	Masters Degree	es other	Integrated Master	s degrees
Diplomas or equiv	alent	or equivalent	qualifications	equivalent qua	alifications	Bachelors (Hon	ours) degrees	degrees accre	dited for the	than the Integra	ated Masters	(often denoted MI	0,
qualifications accr	redited	accredited for	r the purpose	accredited for	the purpose of	accredited for th	ne purpose of	purpose of CE	ng registration	accredited as fu	urther learning	accredited for the	purpose of
for the purpose of	EngTech	of progressio	n towards IEng	IEng registrati	on will have an	IEng registration	n will have an	will have an er	nphasis on	to Masters leve	I for the	CEng registration	will have
registration will ha	ive an	registration w	ill have an	emphasis on t	he applications	emphasis on the	e applications developing solutions to		purpose of CEng registration		an emphasis on developing		
emphasis on the p	oractical	emphasis on	the practical	of current and developing		of current and developing engineering problems using		vary in nature. Some offer		solutions to problems using			
application of curre	ent and	application of	current and	technology.		technology.		new or existing	g technologies,	the chance to s	tudy in	new or existing te	-
developing techno	ology.	developing te	chnology.					through innova	ation, creativity	greater depth p	articular	through innovatio	n, creativity
								and change.		aspects or appl	ications	and change.	
										of a broader dis	cipline in	The Integrated Ma	asters will
										which the gradu	uate holds	go beyond the ou	tcomes
										an Honours de	gree at	of accredited Bac	helors
										Bachelors level	. Others bring	(Honours) degree	s to provide
										together differe	nt engineering	a greater range a	nd depth of
										disciplines or su	ubdisciplines	specialist knowled	dge, within
										in the study of a	a particular	an authentic envir	ronment, as
										topic, or engine	ering	well as a broader	
										application.		general academic	base.
ISCED:	Level 3	ISCED:	Level 5	ISCED:	Level 5	ISCED:	Level 6	ISCED:	Level 6	ISCED:	Level 7	ISCED:	Level 7
EQF:	Level 4	EQF:	Level 4/5	FOF	Level 5	FOF	Level 6	EQF:	Level 6	EQF:	Level 7	EQF:	Level 7



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An individual who has	An individual who has	An individual who has	Graduates from Bachelors	Graduates from a Bachelors	These programmes should	These programmes should
completed a National	completed a Higher	completed a Foundation	degrees or Bachelors	(Honours) degree must	provide a foundation for	provide a foundation for
Certificate/Diploma or	National Certificate or	degree or equivalent	(Honours) degrees must	achieve the prescribed	leadership and innovative	leadership and innovative
equivalent qualification	equivalent qualification	qualification must achieve the	achieve the prescribed	learning outcomes and will	engineering practice.	engineering practice.
or apprenticeship must	or apprenticeship must	prescribed learning outcomes	learning outcomes and will	possess a coherent body		
chieve the prescribed	achieve the prescribed	and will possess a coherent	possess a coherent body	of knowledge including	Graduates from a Masters	Graduates from an Integrated
earning outcomes and will	learning outcomes and will	body of knowledge including	of knowledge including	mathematics, natural science	Degree other than the	Masters degree must achieve
ossess a coherent body	possess a coherent body	mathematics, natural science	mathematics, natural science	and engineering principles,	Integrated Masters must	the prescribed learning
knowledge including	of knowledge including	and engineering principles,	and engineering principles,	and a proven ability to apply	achieve the prescribed	outcomes and will possess
athematics, natural science	mathematics, natural science	and a proven ability to apply	and a proven ability to apply	that knowledge to analyse	learning outcomes and will	a broad and coherent body
nd engineering principles,	and engineering principles,	that knowledge to analyse	that knowledge to analyse	and solve complex problems.	possess a coherent body	of knowledge including
nd a proven ability to apply	and a proven ability to apply	and solve broadly-defined	and solve broadly-defined	Some of the knowledge will	of knowledge including	mathematics, natural science
at knowledge to analyse	that knowledge to analyse	problems using established	problems using established	be at the forefront of the	mathematics, natural science	and engineering principles,
nd solve well-defined	and solve well-defined	principles and techniques.	principles and techniques.	particular subject of study.	and engineering principles,	and a proven ability to apply
ogrammes of work and	programmes of work and		Some of the knowledge		and a proven ability to apply	that knowledge to analyse
ssociated problems using	associated problems using	With an appreciation of	will be informed by current	Graduates will be able to	that knowledge to analyse	and solve complex problems.
stablished principles and	established principles and	professional engineering	developments in the subject	select and apply quantitative	and solve complex problems.	Much of the knowledge will
chniques.	techniques.	practice and ethics,	of study.	and computational analysis	Much of the knowledge will	be at the forefront of the
		graduates will be able to		techniques, recognising the	be at the forefront of the	particular subject of study.
		apply their knowledge and	With an appreciation of	limitations of the methods	particular subject of study.	
		skills to new situations.	professional engineering	employed.		Graduates will be able to
			practice and ethics,		Graduates will be able to	select and apply quantitative
			graduates will be	With an appreciation of	select and apply quantitative	and computational analysis
			commercially aware and able	professional engineering	and computational analysis	techniques in the absence
			to apply their knowledge	practice and ethics,	techniques in the absence	of complete data, discussing
			and skills to design and	graduates will be	of complete data, discussing	the limitations of the methods
			deliver products, systems	commercially aware and able	the limitations of the methods	employed.
			and processes to meet	to apply their knowledge and	employed.	
			defined needs using current	skills to design and deliver		With an appreciation of
			technology.	new products or services to	With an appreciation of	professional engineering
				meet defined needs using	professional engineering	practice and ethics,
				new or existing technologies.	practice and ethics,	graduates will be
					graduates will be	commercially aware and able
					commercially aware and able	to apply their knowledge
					to apply their knowledge	and skills to design, deliver
					and skills to design, deliver	and evaluate innovative new
					and evaluate innovative new	products or services to meet
					products or services to meet	defined needs using new or
					defined needs using new or	existing technologies.
					existing technologies.	

Learning Outcomes – AAQA first edition and AHEP fourth edition

The table below presents the learning outcomes for AHEP 4 and AAQA with the addition of a note to indicate the level at which each learning outcome must be demonstrated. Note that when consideration is given to accreditation of programmes of further learning no consideration is needed of any 'learning outcome achieved at previous level of study' as accreditation will only apply for individuals who have completed a suitably accredited programme for which the programme serves as further learning.

Notes on learning outcomes

1. Well-defined problems involve several factors, but with few of these exerting conflicting constraints, and can be solved through the standardised application of engineering science.

2. **Broadly-defined problems** involve a variety of factors which may impose conflicting constraints, but can be solved by the application of engineering science and well-proven analysis techniques.

3. Complex problems have no obvious solution and may involve wide-ranging or conflicting technical issues and/or user needs that can be addressed through creativity and the resourceful application of engineering science.

4. These learning outcomes are minimum threshold standards and should be interpreted in the context of a particular disciplinary or multidisciplinary engineering practice, and the level of study.

5. An individual who has completed an approved or accredited programme must meet all of the identified learning outcomes, however student learning hours are likely to vary between the five key areas of learning.

6. It is recognised that an approved or accredited programme may develop learning outcome(s) beyond the threshold level, including where learning outcomes are met at the previous level of study, however such additional learning is not prescribed or required for academic accreditation.

7. The learning outcome level required to meet the required programme outcome/registration level is not necessarily that which corresponds with the final year/stage of the programme. Rather, it

provides one indication of the earliest programme stage at which the required programme outcome could be met. (As extreme examples, Security (T10-M10) and Lifelong Learning (T18-M18) are defined identically for all registration levels, which implies that they could in principle be met in the first year of an undergraduate programme. These are however AHEP 4 minimum threshold standards, and HEIs may feel that the integrity of their academic programmes would require a more sophisticated approach to security or lifelong learning to be adopted for an MEng than for an EngTech or BEng programme.)

8. The learning outcomes in this document may be a useful reference point when assessing the knowledge and understanding of an individual who does not hold an accredited degree (for example those individuals following sector specific apprenticeships, in-company training programmes, IPD Schemes, etc.).

9. The Engineering Council defines security as 'the state of relative freedom from threat or harm caused by deliberate, unwanted, hostile or malicious acts. It operates on a number of levels ranging from national security issues to countering crime'. See the guidance note at: <u>www.engc.org.uk/security</u>

10 Bachelors Top-up Degrees are programmes of further learning, typically preceded by Foundation Degrees or HNC/Ds (or equivalent qualifications). Bachelors top-up degrees can be accredited either as further learning for IEng registration or as partially meeting the academic requirements for CEng (Partial CEng).



	Engineering Techni	ician (EngTech)	Inco	rporated Engineer (I	Eng)		Chartered En	gineer (CEng)	
Area of learning	National Certificates and equivalent qualifications and apprenticeships accredited or approved as fully meeting the academic requirement for EngTech registration (EngTech)	meeting the academic requirement for	Foundation degrees, Higher National Diplomas and equivalent qualifications and apprenticeships accredited or approved as fully meeting the academic requirement for EngTech registration and partially meeting the academic requirement for IEng registration (Partial IEng)	Bachelors Top-up Degrees and equivalent qualifications and apprenticeships accredited or approved as meeting the requirement for further learning for IEng registration (IEng Further Learning)	Bachelors degrees and Bachelors (Honours) and equivalent qualifications and apprenticeships accredited or approved as fully meeting the academic requirement for IEng registration (IEng)	Bachelors (Honours) Top-up Degrees and equivalent qualifications and apprenticeships accredited or approved as partially meeting the academic requirement for CEng registration (Partial CEng)	Bachelors (Honours) degrees and equivalent qualifications and apprenticeships accredited or approved as fully meeting the academic requirement for IEng registration and partially meeting the academic requirement for CEng registration (Partial CEng)	accredited or approved as meeting the requirement for further learning for	Integrated Masters degrees and equivalent qualifications and apprenticeships accredited or approved as fully meeting the academic requirement for CEng registration (CEng)
Science and ma The study of eng Science, mathematics and engineering principles	ineering requires a substant T1 . Apply knowledge of		F1. Apply knowledge of	B1. Apply knowledge of		C1. Apply knowledge of		comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness	will be at the forefront of the particular subject of study and informed by a critical awareness
								of new developments and the wider context of engineering. (ISCED L7/EQF L7)	of new developments and the wider context of engineering. (ISCED L7/EQF L7)

									
Area of	National Certificates	Higher National	Foundation degrees	Bachelors Top-up	Bachelors degrees	Bachelors (Honours)	Bachelors (Honours)	Masters degrees	Integrated Masters
learning	(continued)	Certificates (continued)	· · · ·	(continued)	(continued)	Top-up (continued)	(continued)	(continued)	(continued)
	completion of an accred	ited or approved progra	amme, an individual will	De able to:					
Engineering and		ion of ongineering concer	ate and table to analyze y	model and actual problem	At higher levels of stud	v opgingoro will work with	information that may be	uncortain ar incomplete	
Problem	ysis involves the applicat T2. Analyse well-	H2. Analyse well-	F2. Analyse broadly-	B2. Analyse broadly-	B2. Analyse broadly-	C2. Analyse complex	C2. Analyse complex	M2. Formulate and	M2. Formulate and
	defined problems	defined problems	defined problems	defined problems	defined problems	problems to reach	problems to reach	analyse complex	analyse complex
analysis	reaching substantiated	reaching substantiated	reaching substantiated	reaching substantiated		1.	substantiated	problems to reach	problems to reach
	conclusions.	conclusions.	conclusions.	conclusions using	conclusions using	conclusions using	conclusions using	substantiated	substantiated
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L5/ EQF L4/5)	first principles of	first principles of	first principles of	first principles of	conclusions. This will	conclusions. This will
				mathematics, statistics,	mathematics, statistics,	mathematics, statistics,	mathematics, statistics,		involve evaluating
				natural science and	natural science and	natural science and	natural science and	available data using	available data using
				engineering principles.	engineering principles.	engineering principles.	engineering principles.	first principles of	first principles of
				(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	mathematics, statistics,	mathematics, statistics,
								natural science and	natural science and
								engineering principles,	engineering principles,
								and using engineering	and using engineering
								judgment to work	judgment to work
								with information that	with information that
								may be uncertain or	may be uncertain or
								incomplete, discussing	incomplete, discussing
								the limitations of the	the limitations of the
								techniques employed.	techniques employed.
								(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
Analytical tools	T3. Use appropriate	H3. Use appropriate	F3. Use appropriate	B3. Select and	B3. Select and	C3. Select and	C3. Select and	M3. Select and	M3. Select and
and techniques	computational and	computational and	computational and	apply appropriate	apply appropriate	apply appropriate	apply appropriate	apply appropriate	apply appropriate
	analytical techniques	analytical techniques	analytical techniques to	computational and	computational and	computational and	computational and	computational and	computational and
	to solve well-defined	to solve well-defined	model broadly-defined	analytical techniques to	analytical techniques to	analytical techniques	analytical techniques	analytical techniques	analytical techniques
	problems.	problems recognising	problems.	model broadly-defined	model broadly-defined	to model complex	to model complex	to model complex	to model complex
	(ISCED L3/ EQF L4)	the limitations of the	(ISCED L5/EQF L5)	problems, recognising	problems, recognising	problems, recognising	problems, recognising	problems, discussing	problems, discussing
		techniques employed.		the limitations of the	the limitations of the	the limitations of the	the limitations of the	the limitations of the	the limitations of the
		(ISCED L5/ EQF L4/5)		techniques employed.	techniques employed.	techniques employed.	techniques employed.	techniques employed.	techniques employed.
				(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
Technical	T4. Select and use	H4. Select and use	F4. Select and use	B4. Select and	B4. Select and	C4. Select and	C4. Select and	M4. Select and	M4. Select and
literature	technical literature	technical literature	technical literature	evaluate technical	evaluate technical	evaluate technical	evaluate technical	critically evaluate	critically evaluate
	and other sources of	and other sources of	and other sources of	literature and other	literature and other	literature and other	literature and other	technical literature	technical literature
	information to address	information to address	information to address	sources of information	sources of information	sources of information	sources of information	and other sources of	and other sources of
	well-defined problems.	well-defined problems.	broadly-defined	to address broadly-	to address broadly-	to address complex	to address complex	information to solve	information to solve
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	problems.	defined problems.	defined problems.	problems.	problems.	complex problems.	complex problems.
			(ISCED L5/EQF L5)	(ISCED L5/EQF L5)	(ISCED L5/EQF L5)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L7/EQF L7)	(ISCED L7/EQF L7)

Area of	National Certificates	Higher National	Foundation degrees	Bachelors Top-up	Bachelors degrees	Bachelors (Honours)	Bachelors (Honours)	Masters degrees	Integrated Masters
learning	(continued)	Certificates (continued)	(continued)	(continued)	(continued)	Top-up (continued)	(continued)	(continued)	(continued)
)n successful o	completion of an accred	ited or approved progra	mme, an individual will	be able to:					
esign and inno	ovation								
esign is the cre	ation and development of	an economically viable p	roduct, process or syster	n to meet a defined need	. It involves significant tee	chnical and intellectual ch	allenges commensurate	with the level of study.	
)esign	T5. Contribute to	H5. Design solutions	F5. Design solutions	B5. Design solutions	B5. Design solutions	C5. Design solutions	C5. Design solutions	M5. Design solutions	M5. Design solutions
	design solutions for	for well-defined	for broadly-defined	for broadly-defined	for broadly-defined	for complex	for complex	for complex problems	for complex problems
	well-defined technical	technical problems	problems that meet	problems that meet	problems that meet	problems that meet	problems that meet	that evidence some	that evidence some
	problems and assist	and assist with the	a combination of	a combination of	a combination of	a combination of	a combination of	originality and meet	originality and meet
	with the design of	design of systems,	user, business and	societal, user, business	societal, user, business	societal, user, business	societal, user, business	a combination of	a combination of
	systems, components	components or	customer needs as	and customer needs as	and customer needs as	and customer needs as	and customer needs as	societal, user, business	societal, user, busines
	or processes to meet	processes to meet	appropriate. This will	appropriate. This will	appropriate. This will	appropriate. This will	appropriate. This will	and customer needs as	and customer needs a
	business, customer	business, customer	involve consideration	involve consideration	involve consideration	involve consideration	involve consideration	appropriate. This will	appropriate. This will
	or user needs as	or user needs as	of applicable	of applicable health	of applicable health	of applicable health	of applicable health	involve consideration	involve consideration
	appropriate. This will	appropriate. This will	health and safety,	and safety, diversity,	and safety, diversity,	and safety, diversity,	and safety, diversity,	of applicable health	of applicable health
	involve consideration	involve consideration	diversity, inclusion,	inclusion, cultural,	inclusion, cultural,	inclusion, cultural,	inclusion, cultural,	and safety, diversity,	and safety, diversity,
	of applicable	of applicable	cultural, societal and	societal, environmental	societal, environmental	societal, environmental	societal, environmental	inclusion, cultural,	inclusion, cultural,
	health and safety,	health and safety,	environmental matters,	and commercial	and commercial	and commercial	and commercial	societal, environmental	societal, environmenta
	diversity, inclusion,	diversity, inclusion,	codes of practice and	matters, codes of	matters, codes of	matters, codes of	matters, codes of	and commercial	and commercial
	cultural, societal and	cultural, societal and	industry standards.	practice and industry	practice and industry	practice and industry	practice and industry	matters, codes of	matters, codes of
	environmental matters,	environmental matters,	(ISCED L5/EQF L5)	standards.	standards.	standards.	standards.	practice and industry	practice and industry
	codes of practice and	codes of practice and		(ISCED L5/EQF L5)	(ISCED L5/EQF L5)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	standards.	standards.
	industry standards.	industry standards.						(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)							
ntegrated/					B6. Apply an integrated	1	1		M6. Apply an
ystems	1	approach to the	approach to the		or systems approach to			Learning outcome	integrated or systems
pproach	solution of well-defined		solution of broadly-	the solution of broadly-		the solution of complex		achieved at previous	approach to the
	1'	problems.	defined problems.	defined problems.	defined problems.	problems.	problems.	level of study	solution of complex
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L5/EQF L5)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(N.A.)	problems. (ISCED L6/EQF L6)

Area of	National Certificates	Higher National	Foundation degrees	Bachelors Top-up	Bachelors degrees	Bachelors (Honours)	Bachelors (Honours)	Masters degrees	Integrated Masters
learning	(continued)	Certificates (continued)	(continued)	(continued)	(continued)	Top-up (continued)	(continued)	(continued)	(continued)
On successful of	completion of an accred	ited or approved progra	mme, an individual will	be able to:					
The engineer an	nd society								
Engineering activ	vity can have a significant	societal impact and Engi	neers must operate in a r	esponsible and ethical m	anner, recognise the imp	ortance of diversity, and h	nelp ensure that the bene	fits of innovation and pro	gress are shared
equitably and do	not compromise the natu	ral environment or deplet	e natural resources to the	e detriment of future gene	erations.				
Sustainability	T7. Evaluate the	H7. Evaluate the	F7. Evaluate the		B7. Evaluate the	C7. Evaluate the	C7. Evaluate the	M7. Evaluate the	M7. Evaluate the
	environmental and	environmental and	environmental and		environmental and	environmental and	environmental and	environmental and	environmental and
	societal impact of	societal impact of	societal impact of		societal impact of	societal impact of	societal impact of	societal impact of	societal impact of
	solutions to well-	solutions to well-	solutions to broadly-	Learning outcome	solutions to broadly-	solutions to complex	solutions to complex	solutions to complex	solutions to complex
	defined problems.	defined problems.	defined problems.	u u u u u u u u u u u u u u u u u u u	defined problems.	problems and minimise	problems and minimise	problems (to include	problems (to include
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L5/EQF L5)	achieved at previous level of study	(ISCED L5/EQF L5)	adverse impacts.	adverse impacts.	the entire life-cycle of	the entire life-cycle of
						(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	a product or process)	a product or process)
				(N.A.)				and minimise adverse	and minimise adverse
								impacts.	impacts.
								(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
Ethico	TO Apply othing	LO Apply othing		Do Identify and	D0 Identificand	Co Identificand			MO Johan tifu and
Ethics	T8. Apply ethical	H8. Apply ethical	F8. Identify ethical	B8. Identify and	B8. Identify and	C8. Identify and	C8. Identify and		M8. Identify and
	principles and	principles and	concerns and make reasoned ethical	analyse ethical	analyse ethical	analyse ethical	analyse ethical		analyse ethical
	recognise the need for	recognise the need for		concerns and make	concerns and make	concerns and make	concerns and make	Learning outcome	concerns and make
	engineers to exercise	engineers to exercise their responsibilities in	choices informed by professional codes of	reasoned ethical	reasoned ethical choices informed by	reasoned ethical	reasoned ethical	achieved at previous	reasoned ethical
	their responsibilities in an ethical manner and	an ethical manner and	conduct.	choices informed by professional codes of	professional codes of	choices informed by professional codes of	choices informed by professional codes of	level of study	choices informed by professional codes of
	in line with professional		(ISCED L5/EQF L5)	conduct.	conduct.	conduct.	conduct.	(N.A.)	conduct.
	codes of conduct.	codes of conduct.	(130ED L3/EQF L3)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
		(ISCED L3/ EQF L4)							
Risk	T9. Identify, evaluate	H9. Identify, evaluate	F9. Identify, evaluate	B9. Use a risk	B9. Use a risk	C9. Use a risk	C9. Use a risk		M9. Use a risk
	and mitigate risks (the	and mitigate risks (the	and mitigate risks (the	management process	management process	management process	management process		management process
	effects of uncertainty)	effects of uncertainty)	effects of uncertainty)	to identify, evaluate	to identify, evaluate	to identify, evaluate	to identify, evaluate		to identify, evaluate
	specific to their field of	associated with a	associated with a	and mitigate risks (the	and mitigate risks (the	and mitigate risks (the	and mitigate risks (the	Learning outcome	and mitigate risks (the
	activity.	well-defined project or	particular project or	effects of uncertainty)	effects of uncertainty)	effects of uncertainty)	effects of uncertainty)	achieved at previous	effects of uncertainty)
	(ISCED L3/ EQF L4)	activity.	activity.	associated with a	associated with a	associated with a	associated with a	level of study	associated with a
		(ISCED L5/ EQF L4/5)	(ISCED L5/EQF L5)	particular project or	particular project or	particular project or	particular project or	(N.A.)	particular project or
				activity.	activity.	activity.	activity.		activity.
				(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
Security	T10. Adopt a holistic	H10. Adopt a holistic	F10. Adopt a holistic		B10. Adopt a holistic		C10. Adopt a holistic		M10. Adopt a holistic
	and proportionate approach to the	and proportionate approach to the	and proportionate approach to the	Learning outcome	and proportionate	Learning outcome	and proportionate approach to the	Learning outcome	and proportionate
	mitigation of security	mitigation of security	mitigation of security	achieved at previous level of study	approach to the mitigation of security	achieved at previous level of study	mitigation of security	achieved at previous level of study	approach to the mitigation of security
	risks.	risks.	risks.	(N.A.)	risks.		risks.		risks.
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(11.7.)	(ISCED L3/ EQF L4)	(N.A.)	(ISCED L3/ EQF L4)	(N.A.)	(ISCED L3/ EQF L4)
Equality,	T11. Recognise the	H11. Recognise the	F11. Recognise		B11. Recognise	C11. Adopt an	C11. Adopt an		M11. Adopt an
diversity and	importance of equality,	importance of equality,	the responsibilities,		the responsibilities,	inclusive approach to	inclusive approach to		inclusive approach to
inclusion	diversity and inclusion	diversity and inclusion	benefits and		benefits and	engineering practice	engineering practice		engineering practice
	in the workplace.	in the workplace.	importance of		importance of	and recognise the	and recognise the		and recognise the
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	supporting equality,	Learning outcome	supporting equality,	responsibilities,	responsibilities,	Learning outcome	responsibilities,
			diversity and inclusion.	achieved at previous	diversity and inclusion.	benefits and	benefits and	achieved at previous	benefits and
			(ISCED L5/EQF L5)	level of study	(ISCED L5/EQF L5)	importance of	importance of	level of study	importance of
			. ,	(N.A.)	. ,	supporting equality,	supporting equality,	(N.A.)	supporting equality,
						diversity and inclusion.	diversity and inclusion.		diversity and inclusion.
						(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
							. ,		

Area of	National Certificates	Higher National	Foundation degrees	Bachelors Top-up	Bachelors degrees	Bachelors (Honours)	Bachelors (Honours)	Masters degrees	Integrated Masters
learning	(continued)	Certificates (continued)	_	(continued)	(continued)	Top-up (continued)	(continued)	(continued)	(continued)
	,	ited or approved progra	· · · · · ·	· · · · ·	(continuou)				
Engineering prac			,						
The practical appl	lication of engineering co	ncepts and tools, enginee s value in economic, socia			nmunication skills. Engine	eers also require a sound	grasp of the commercial	context of their work, spe	cifically the ways an
Practical and	T12. Use practical	H12. Use practical	F12. Use practical		B12. Use practical	C12. Use practical	C12. Use practical		M12. Use practical
	laboratory and	laboratory and	laboratory and	Learning outcome	laboratory and	laboratory and	laboratory and	Learning outcome	laboratory and
skills	workshop skills to	workshop skills to	workshop skills to	achieved at previous	workshop skills to	workshop skills to	workshop skills to	achieved at previous	workshop skills to
		investigate well-defined	investigate broadly-	level of study	investigate broadly-	investigate complex	investigate complex	level of study	investigate complex
	problems.	problems.	defined problems.	(N.A.)	defined problems.	problems.	problems.	(N.A.)	problems.
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L5/EQF L5)		(ISCED L5/EQF L5)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
Materials,	T13. Select and apply	H13. Select and apply	F13. Select and apply		B13. Select and apply	C13. Select and apply	C13. Select and apply		M13. Select and apply
, i	appropriate materials,	appropriate materials,	appropriate materials,		appropriate materials,	appropriate materials,	appropriate materials,		appropriate materials,
technologies		equipment, engineering	equipment, engineering	Learning outcome	equipment, engineering	equipment, engineering	equipment, engineering	Learning outcome	equipment, engineering
and processes	technologies and	technologies and	technologies and	achieved at previous	technologies and	technologies and	technologies and	achieved at previous	technologies and
	processes to plan and	processes to plan and	processes.	level of study	processes.	processes, recognising	processes, recognising	level of study	processes, recognising
	undertake well-defined	undertake well-defined	(ISCED L5/EQF L5)	(N.A.)	(ISCED L5/EQF L5)	their limitations.	their limitations.	(N.A.)	their limitations.
	programmes of work.	programmes of work.				(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)							
Quality	T14. Recognise	H14. Recognise	F14. Recognise	<u> </u>	B14. Recognise	C14. Discuss the	C14. Discuss the		M14. Discuss
management	the need for quality	the need for quality	the need for quality		the need for quality	role of quality	role of quality		the role of quality
indiagonion	management systems	management systems	management systems	Learning outcome	management systems	management systems	management systems	Learning outcome	management systems
	and continuous	and continuous	and continuous	achieved at previous	and continuous	and continuous	and continuous	achieved at previous	and continuous
	improvement in the	improvement in the	improvement in the	level of study	improvement in the	improvement in the	improvement in the	level of study	improvement in the
	context of well-defined		context of broadly-	(N.A.)	context of broadly-	context of complex	context of complex	(N.A.)	context of complex
	problems.	problems.	defined problems.	(((), ()))	defined problems.	problems.	problems.		problems.
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L5/EQF L5)		(ISCED L5/EQF L5)	(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
Engineering	T15. Demonstrate	H15. Apply knowledge	F15. Apply knowledge	B15. Apply knowledge	B15. Apply knowledge	C15. Apply knowledge	C15. Apply knowledge		M15. Apply knowledge
	awareness of	of engineering	of engineering	of engineering	of engineering	of engineering	of engineering		of engineering
	engineering	management	management	management	management	management	management		management
	management	principles, commercial	principles, commercial	principles, commercial	principles, commercial	principles, commercial	principles, commercial		principles, commercial
	l e	context and project	context and project	context, project	context, project	context, project and	context, project and	Learning outcome	context, project and
	context and project	management to	management.	management and	management and	change management,	change management,	achieved at previous	change management,
	management.	well-defined problems.	(ISCED L5/EQF L5)	relevant legal matters.	relevant legal matters.	and relevant legal	and relevant legal	level of study	and relevant legal
	(ISCED L3/ EQF L4)	(ISCED L5/ EQF L4/5)	((ISCED L6/EQF L6)	(ISCED L6/EQF L6)	matters including	matters including	(N.A.)	matters including
				(intellectual property	intellectual property		intellectual property
						rights.	rights.		rights.
						(ISCED L6/EQF L6)	(ISCED L6/EQF L6)		(ISCED L6/EQF L6)
Teamwork	T16. Function	H16. Function	F16. Function		B16. Function		C16. Function	M16. Function	M16. Function
	effectively as an	effectively as an	effectively as an		effectively as an		effectively as an	effectively as an	effectively as an
	individual and as a	individual and as a	individual, and as a	Learning outcome	individual, and as a	Learning outcome	individual, and as a	individual, and as a	individual, and as a
	member of a team.	member of a team.	member or leader of a	achieved at previous	member or leader of a	achieved at previous	member or leader of a	member or leader	member or leader
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	team.	level of study	team.	level of study	team.	of a team. Evaluate	of a team. Evaluate
		, , ,	(ISCED L5/EQF L5)	(N.A.)	(ISCED L5/EQF L5)	(N.A.)	(ISCED L5/EQF L5)	effectiveness of own	effectiveness of own
								and team performance.	and team performance.
								(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
Communication	T17. Communicate	H17. Communicate	F17. Communicate		B17. Communicate	C17. Communicate	C17. Communicate	M17. Communicate	M17. Communicate
	effectively with	effectively with	effectively with		effectively with	effectively on complex	effectively on complex	effectively on complex	effectively on complex
	technical and non-	technical and non-	technical and non-		technical and non-	engineering matters	engineering matters	engineering matters	engineering matters
	technical audiences.	technical audiences.	technical audiences.	Learning outcome	technical audiences.	with technical and non-	with technical and non-	with technical and non-	with technical and non-
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	achieved at previous	(ISCED L3/ EQF L4)	technical audiences.	technical audiences.	technical audiences,	technical audiences,
				level of study		(ISCED L6/EQF L6)	(ISCED L6/EQF L6)	evaluating the	evaluating the
				(N.A.)				effectiveness of the	effectiveness of the
								methods used.	methods used.
								(ISCED L7/EQF L7)	(ISCED L7/EQF L7)
Lifelong	T18. Plan and record	H18. Plan and record	F18. Plan and record		B18. Plan and record		C18. Plan and record	,	M18. Plan and record
-	self-learning and	self-learning and	self-learning and	Loorning outcome	self-learning and		self-learning and		self-learning and
	improve performance,	improve performance,	development as the	Learning outcome	development as the	Learning outcome	development as the	Learning outcome	development as the
	as the foundation for	as the foundation for	foundation for lifelong	achieved at previous	foundation for lifelong	achieved at previous	foundation for lifelong	achieved at previous	foundation for lifelong
	lifelong learning/CPD.	lifelong learning/CPD.	learning/CPD.	level of study (N.A.)	learning/CPD.	level of study (N.A.)	learning/CPD.	level of study (N.A.)	learning/CPD.
	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(ISCED L3/ EQF L4)	(11.7.)	(ISCED L3/ EQF L4)	(11.7.)	(ISCED L3/ EQF L4)		(ISCED L3/ EQF L4)

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