## **ENGINEERING COUNCIL OF SOUTH AFRICA**

# TECHNOLOGY PROGRAMMES IN ENGINEERING DOCUMENT FOR COMPLETION BY THE ACCREDITATION TEAM SECTION 5 DOCUMENTATION FOR USE DURING ACCREDITATION VISIT REPORT

EDUCATIONAL INSTITUTION		
SCHOOL/DEPARTMENT		
DISCIPLINE		
PROGRAMME		
PERSON RESPONSIBLE FOR PROGRAMME		
TYPE OF VISIT		
DATE OF VISIT		
DATE OF PREVIOUS VISIT		
OUTCOME OF PREVIOUS VISIT		
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The open lines between the questions are for comments\*

REF. (SEC. 2)	QUESTION	DO	CUME (3.1	NTATI 1.1)	ION	IN	TER\ (3.1	/IEW 1.2)	/S	IN	SPEC (3.1	CTION 1.3)	IS
		Y	ES	N	0	YE	S	Ν	0	YE	ES	N	С
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	ΒT

2.2	Is the purpose of the programme clearly stated?					
2.2	Is the description/specification of the programme clearly stated?					
2.2	Does the purpose of the qualification describe the work of an Engineering Professional?					
2.3.1	Does the description of the criteria/specification/purpose of the qualification meet the ECSA Criteria for the relevant qualification -					
	<ul> <li>General engineering – identification and analysis of problems, problem solving.</li> </ul>					
	<ul> <li>Management and communication – in the working environment of self and others.</li> </ul>					
	Engineering specific to discipline and the target industry.					
	<ul> <li>Application of engineering practice and ethical work practice – including evaluation of ability, competency and work of oneself and of others.</li> </ul>					

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REF.	QUESTION	DC	CUME	INTAT	ION	IN	TER'	VIEW	/S	IN	SPE	IOITC	NS
(SEC. 2)			(3.	1.1)			(3.	1.2)			(3.1	1.3)	
		Y	ES	N	0	YE	ES	N	0	Y	ES	N	0
		Ν	BT	Ν	BT	Ν	BT	Ν	BT	Ν	BT	Ν	BT
		D		D		D		D		D		D	
n												<del></del>	
2.3.2	For the National Diploma Engineering												
	Does the purpose indicate -											$\rightarrow$	
2.3.2	A basic structure to meet the core requirements/underpinning knowledge												
	of mathematics, science and technology as applied in engineering. This												
	includes but is not limited to:												
					1								
	Use and interpretation of mathematical formulas used in engineering												
	calculations												
					1								
	Performing statistical analyses using standard methods and evaluation												
	Interpretation and evaluation of results												
												$\rightarrow$	
	<ul> <li>Using basic scientific principles to reason concerning engineering</li> </ul>												
	Components, systems and procedures												
												$\square$	
	Engineering science applicable to the appropriate sub-discipline											$\square$	
	Knowledge that address the target industry's specific needs.												

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REF.	QUESTION	DO	CUME		TION	IN	ITER	VIEV	/S	IN	SPEC	CTIO	NS
(SEC. 2)			(3.1	1.1)			(3.	1.2)			(3.1	1.3)	
		Y	ES	Ν	10	Y	ES	N	0	Y	ES	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
II.						1							
2.3.2 cont.	<ul> <li>Formalised education through a co-operative education system in which full integration of experiential learning in a real life industrial environment compliments the academic classroom and integrated laboratory work.</li> </ul>												
	Development of manipulative and functional skill.											$\square$	
		-											
	<ul> <li>Integration of technological knowledge and skills that develop 'thinking skills' to apply the learning achieve through the programme.</li> </ul>												
												$ \rightarrow $	
	<ul> <li>Solving real/industrial problems through the application of current known technology.</li> </ul>												
2.3.3	For the B. Tech. Degree Engineering Does the purpose indicate												
	<ul> <li>That the qualification inclusive of the relevant National Diploma in Engineering or proof of equivalent competency.</li> </ul>												
	<ul> <li>A higher level of proficiency (than that required in the National Diploma) in a particular engineering technology is achieved.</li> </ul>												

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REF. (SEC, 2)	QUESTION	DO	CUME (3.1	NTAT 1.1)	TION	١N	ITER	VIEW	/S	IN	SPEC	CTIO	NS
		YE	ĒS	Ń	10	Y	ES	N	0	Y	ES	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
2.3.3 cont.	<ul> <li>A basic structure to meet the core requirements/underpinning knowledge of mathematics, science and technology as applied in engineering. This includes but is not limited to:</li> </ul>												
	Use of mathematics to solve technical problems and simple modelling												
	<ul> <li>Support reasoning in technical subjects. Evaluation of results of calculations</li> </ul>												
	Perform statistical analyses												
	<ul> <li>Basic science that focuses on the needs of specialist technology area, supports reasoning about engineering phenomena</li> </ul>												
	<ul> <li>Engineering science that focuses on know-how in specialist field, must know how knowledge reacts with related areas and must support interaction with other specialists and generalists</li> </ul>												
	<ul> <li>Technology is transferred for practical purposes. At least 30% of the qualification must be project work involving the solution of real/industrial/applied problems using fundamental principles that underpin current technology.</li> </ul>												

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REF. (SEC_2)	QUESTION	DC	CUME (3.	ENTA 1.1)	TION	11	NTER	VIEW	/S	IN	SPEC		NS
(020:2)		v						. 1.2)			(J. =9	1.3) N	
		N	BT	N	BT	N	BT	N	BT	N	BT	N	BT
		D		D		D		D		D		D	
		1	<u> </u>		1			1					
2.3.3	<ul> <li>Application of knowledge and skills is used in solving complex problems using</li> </ul>												
cont.	analytical thinking, technical and managerial skills.												
2.4	Does the specification comply with the content specified by ECSA with respect to												
	<ul> <li>Identify and solve problems in which responses display that responsible</li> </ul>												
	decisions using critical and creative thinking have been made.												
	<ul> <li>Work effectively with others as a member of a team, group, organisation, community</li> </ul>												
	Organise and manage oneself and one's activities responsibly and effectively												
	Collect, analyse, organise and critically evaluate information					-							
	Communicate officially using viewal, mathematical and/or language skills in												
	Communicate enectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.												
	<ul> <li>Use science and technology effectively and critically, showing responsibility towards the environment and health of others.</li> </ul>												
	<ul> <li>Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.</li> </ul>												

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REF. (SEC. 2)	QUESTION	DC	CUME (3.	intat 1.1)	TION	IN	ITER' (3.	VIEW 1.2)	/S	IN	SPEC (3.	CTIO 1.3)	NS
		Y	ES	Ν	10	Y	ES	N	0	Y	ES	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
2.4 cont.	• In order to contribute to the full personal development of each learner and the social and economic development of the society at large, it must be the												
	of the importance of:												
	<ul> <li>Reflecting on and exploring a variety of strategies to learn more effectively</li> </ul>												
	<ul> <li>Participating as responsible citizens in the life of local, national and global communities</li> </ul>												
	<ul> <li>Being culturally and aesthetically sensitive across a range of social contexts</li> </ul>												
	<ul> <li>Exploring education and career opportunities, and</li> </ul>												
	<ul> <li>Developing entrepreneurial opportunities</li> </ul>												
0.5	Describe to provide a structure and all independent of the the private structure of the the EOOA (and												
2.5	loes the learning structure specified comply with the criteria specified by ECSA for learning strategy with respect to?											$\square$	
2.5.2	Academic Education												
												$\square$	
	<ul> <li>Address components of the qualification that are best learnt using this method of learning.</li> </ul>												

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CAMPUS......DATE.....DATE.

REF.	QUESTION	DC	CUME	ENTA <sup>-</sup> 1 1)	FION	١١	NTER	VIEW	/S	IN	SPEC		NS
(020.2)				···/			(3. <u></u>	1.Z)	$\circ$		(ა. = ୨		
		I N		N		I N		N N	U BT		ES BT		BT
		D	5.	D	51	D	51	D	5.	D	5.	D	
1		0						1		n			
2.5.2	Addressing identifiable components of the qualification as described in the												
cont.	criteria including the acquisition of knowledge and skills and the ability to												
	<ul> <li>Must have appropriate entrance requirements/prerequisites.</li> </ul>												
	Must have definite exit criteria/measurable competencies.												
	<ul> <li>Problem solving, design and synthesis must follow a logical method and become progressively more complex.</li> </ul>												
	Resources must be adequate to complete the learning specified. The resources include but are not limited to:												
	Lecturers with adequate knowledge, skill and appropriate experience												
	I utors with adequate knowledge, skill and appropriate experience						_						
	Locture facilities and tutorial rooms, resource conters												
	Provision for maintaining and developing the resources must be adequate. In the case of staff issues, these should include but are not limited to:												
									T				
	Ensuring adequate knowledge												

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REF. (SEC. 2)	QUESTION	DO	CUME (3.	ENTAT 1.1)	TION	IN	ITER (3.	VIEV 1.2)	VS	IN	SPEC (3.	CTIO 1.3)	NS
		Y	ES	N	10	YE	ES	N	0	Y	ΞS	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
1		M				1		1			 		
2.5.2 cont.	<ul> <li>Ensuring adequate teaching skills</li> </ul>												
	<ul> <li>Ensuring that industrial exposure is current and appropriate for the content taught</li> </ul>												
	Appropriate work load												
	Adequate staff retention and variation										<u> </u>		
	Assessment												
	<ul> <li>Must have effective/adequate and appropriate assessment/evaluation method (described and applied).</li> </ul>												
	<ul> <li>Credit/assessment must be appropriate to the type of learning and the effort required/complexity of the learning. (It is expected that credit earned for tests, tutorials and small projects is proportional to the effort expended and competency/learning achieved.)</li> </ul>												

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REF. (SEC, 2)	QUESTION	DC	CUME	ENTAT 1.1)	ION	IN	ITER'	VIEW	/S	IN	SPEC		NS
(0=0: =)		Y	FS	N 1	0	YF	-(J. -S	1.2) N	0	Y	(J. =S	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
1							1	1			· · · ·		·
		-											
2.5.2 cont.	<ul> <li>The results achieved should indicate a 'typical' rate of success achieved by the learners.</li> </ul>												
2.5.3	Laboratory Work												
	<ul> <li>Develop manipulative skills needed in the workplace using equipment and</li> </ul>												
	instruments currently used in the discipline.											$\square$	
												$ \rightarrow $	
	<ul> <li>Acquire knowledge that can be effectively learnt through hands on activities and to consolidate/review learning acquired through academic studies. Where academic and laboratory studies address the same content, it is expected that the content is addressed concurrently in both using both methods.</li> </ul>												
	<ul> <li>Assessment and credit awarded must be appropriate to the type of learning and the effort required/complexity of the learning.</li> </ul>												
	<ul> <li>The combined work of individuals may lead to a group result but the work of each individual must be clearly identified and assessed independently.</li> </ul>												

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REF. (SEC. 2)	QUESTION	D	DCUME (3.	ENTA .1.1)	TION	I	NTEF (3	RVIEV 8.1.2)	VS	IN	SPEC (3.	CTIO 1.3)	NS
		Y	ΈS		NO	Y	ΈS	Ν	10	Y	ES	N	0
		N D	BT	N D	B	Г N D	BT	N D	BT	N D	BT	N D	BT
		n.					_	_					
2.5.2 cont.	<ul> <li>Adequate resources are available and are used to execute the work specified according to acceptable and safe practice – including but not limited to time, equipment, and supervision.</li> </ul>												
	<ul> <li>Provision for maintaining and developing the resources must be adequate. This includes but is not limited to:</li> </ul>												
	<ul> <li>Ensuring adequate quantities and qualities of appropriate equipment is available</li> </ul>												
	<ul> <li>Ensuring adequate number of technical support staff, teaching staff and supervisory staff and that these staff are competent</li> </ul>												
	<ul> <li>Appropriate work load for the staff</li> </ul>												
	Adequate staff retention and variation.												
	<ul> <li>Assessment and credit awarded must be appropriate to the type of learning and the effort required/complexity of the learning.</li> </ul>												
2.5.4	Practical Assignments/Project Work									$\longrightarrow$			
	Appropriate project work is desirable in all subjects. It is accordiating				_	-				$\rightarrow$			
	<ul> <li>Appropriate project work is desirable in all subjects. It is essential in engineering components of each programme.</li> </ul>												

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REF. (SEC. 2)	QUESTION	CUME (3.1	NTAT I.1)	ION	١N	INTERVIEWS (3.1.2)			IN	SPEC (3.1	TION .3)	IS	
		Y	ΞS	N	0	Y	ES	N	0	YE	ËS	N	C
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT
										n – 1			

2.5.4 cont	<ul> <li>Students must source and evaluate information using libraries and other resources and/or establish information through experimentation. This is combined with making deductions and forming conclusions and reporting results.</li> </ul>				
	<ul> <li>Projects must be more complex at higher levels in the programme, to ensure that many of the skills and knowledge acquired during the earlier learning activities. This includes the application of mathematics, science, communication and computing in problem solving, design and synthesis in progressively more complex exercises.</li> </ul>				
	<ul> <li>Adequate resources are available and are used by the learners for the projects. These include supervision and tuition and guidance, laboratories, libraries and other media sources.</li> </ul>				
	<ul> <li>Safe and ethical practice is applied during the execution of projects and their evaluation.</li> </ul>				
	Assessment and credit awarded must be appropriate to the type of learning and the effort required/complexity of the learning.				
	The work of each student must be clearly identified and assessed independently.				
2.5.5	Does the computer component achieve/address the following -				
		 		<u>au 1</u> .	 

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REF.	QUESTION	DO			ION	IN	ITER	VIEW	'S	IN	SPEC		NS
(SEC. 2)			(3.	1.1)			(3.	1.2)			(3.1	1.3)	
		Y	ES	N	10	YE	ES	N	0	Y	ES	N	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	ВТ
1			1								1	·	
2.5.5	Competency of the students in the use of common computer applications such												
cont	as word processing, drawing and using spread sheets.											$ \longrightarrow $	
	Use of these applications in further studies.												
	<ul> <li>Learning of and application of appropriate software in discipline specific activities.</li> </ul>												
	<ul> <li>Adequate access to the equipment that is required for the work specified.</li> </ul>												
	<ul> <li>Provision for maintaining and developing the resources.</li> </ul>												
	<ul> <li>Tuition and software support that ensure that the specified learning can take place.</li> </ul>												
	<ul> <li>Assessment and credit awarded must be appropriate to the type of learning and the effort required/complexity of the learning.</li> </ul>												
2.5.6	Does Experiential Learning comply with the following -												
	• Execution in accordance with appropriate procedures/guidelines. (These must indicate the learning outcomes required.)												
	Preparation for professional responsibilities must be included.												

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CAMPUS......DATE.....DATE.

REF. (SEC. 2)	QUESTION	DOCUMENTATION (3.1.1)			DOCUMENTATION (3.1.1)			DOCUMENTATION (3.1.1)			OCUMENTATION (3.1.1)			DOCUMENTATION (3.1.1)			VIEW 1.2)	/S	IN	SPE0 (3.1	CTIOI 1.3)	٩S
		YI	ΞS	N	0	YE	ES	N	0	YE	ΞS	N	0									
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT									

2.5.6 cont	Assessment						
	<ul> <li>Assessment and credit awarded must be appropriate to the type of learning and the effort required/complexity of the learning.</li> </ul>						
	<ul> <li>In this regard ECSA expects the mentor evaluator to be a registered person.</li> </ul>						
	<ul> <li>If a mentor/evaluator is not registered with ECSA proof of competency to carry out this activity must be available during the assessment inspections.</li> </ul>						
							•
	<ul> <li>Experiential training must be of industrial character. To achieve this proof of co-operation with industry is required. Learning in a training 'learning' laboratory/environment is not acceptable.</li> </ul>						
	• Experiential training should include but is not limited to work that develops the application and use of the knowledge and skills that have been learnt before the experiential training takes place and that student experience the discipline of working for a relevant industrial organisation.						
	Adequate experiential learning in the National Diploma: Engineering programme consisting of:						

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REF.	QUESTION	DC	CUME	NTAT	ION	١N	ITER'	VIEW	/S	IN	SPEC	OITC	NS
(SEC. 2)			(3.1	1.1)			(3.	1.2)			(3.1	1.3)	
		Y	ES	N	0	Y	ES	N	0	Y	ES	N	0
		N	BT	N	BT	N	BT	N	BT	N	BT	N	BT
		D		D		D		D		D		D	
1		1	<u> </u>				1			1		<u> </u>	
0.5.0													
2.5.6	<ul> <li>A preparatory stage - giving the learner an industrial background, which will another the relate his there are derais studies to the actual work.</li> </ul>												
cont.	enable him to relate his/her academic studies to the actual work situation. It												
	obligations and behaviour expected in the real working environment												
	A basic stage - developing his/hor manipulative and functional skills											$\rightarrow$	
	• An application/project component – this must contain the integration of the												
	technical knowledge and skills needed to add value upon employment.												
	Adequate opportunities to experiential learning must be provided.												
	Adequate mentors, supervisors/tutors and assessors must be provided.												
	Adequate training of the above staff must be provided.				-								
2.6	Is the assessment/quality assurance specified adequate to ensure compliance with												
	the specification with respect to:												
2.6.1	Appropriate assessment for individual components/aspects of the qualification												
	It must be carried out according to defined procedure(s)												
	<ul> <li>All the outcomes of the qualification must be assessed</li> </ul>												

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REF.	QUESTION	DC		NTAT	ION	IN	ITER'	VIEW	/S	IN	SPEC	IOITC	NS
(SEC. 2)			(3.1	1.1)			(3.	1.2)			(3.1	1.3)	ſ
		Y	ES	N	0	YE	ES	N	0	Y	ES	N	0
		N	BT	N	BT	N	BT	N	BT	N	BT	N	BT
		D		D		D		D		D		D	
1			<u> </u>									<u> </u>	
0.04												—	
2.6.1	<ul> <li>The Weighting of the credits must reflect the learning involved, the complexity of the work appaged and its importance in the source.</li> </ul>												
cont.	of the work assessed and its importance in the course												
	The results achieved over a number of years												
	·												
	<ul> <li>Assessments must be accurate measures of the competencies/knowledge</li> </ul>												
	and skills achieved.												
262	Entrance Requirements												
2.0.2													
2.7	Does the documentation show that the programme is revised regularly to address												
	changing requirements and does this take place in a controlled manner?												
	Additional Questions												

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Revised 5 Feb June 2009

#### **SECTION 5: REPORT**

REF. (SEC. 2)	QUESTIONDOCUMENTATION (3.1.1)INTERVIEWS (3.1.2)						/S	IN	SPEC (3.1	:TIOI 1.3)	NS		
		Y	ES	N	0	YE	ΞS	N	0	YE	ES	Ν	0
		N D	BT	N D	BT	N D	BT	N D	BT	N D	BT	N D	BT

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CAMPUS......DATE.....DATE.

Revised 5 Feb 2009

#### **SECTION 5: REPORT**

Deficiencies to be described using the format below

#### The programme is considered deficient in that:

DESCRIPTION OF DEFICIENCIES	COMMENT
	DESCRIPTION OF DEFICIENCIES

Concerns to be described using the format below

#### The programme was found to have the following concerns:

REF.	DESCRIPTION OF CONCERNS	COMMENT

#### Further comments

The following issues that are not addressed in other parts of the report, are recorded by the accreditation team:

ISSUE/COMMENT	COMMENT

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Revised 5 Feb 2009

### **SECTION 5: REPORT**

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*Complete the relevant section			
1.	The accreditation assessment team recommends that the		
0	ND: Engineering: be PROVISIONALLY		
	ACCREDITED until the first group of students graduate in		
0	B Tech: Engineering: be PROVISIONALLY		
	ACCREDITED until the first group of students graduate in		
	subject to addressing the following deficiencies/concerns/comments before		
Deficiencies:			
Concerns:			
Comments:			
2.	The accreditation assessment team recommends that the		
0	ND: Engineering: be ACCREDITED		
	until		
0	B Tech: Engineering: be ACCREDITED		
	until		
	subject to addressing the following deficiencies/concerns/comments before		
Deficiencies:			
Conc	erns:		
UNIVERSITY OF TECHNOLOGY			
CAMPL	JSDATEDISCIPLINE		

3.	The accreditation assessment team recommends that the		
	ND: Engineering:	be withdrawn/withheld* and the	
	B Tech: Engineering:	be withdrawn/withheld*	
* Delete what is not applicable			
Reas	sons:		
Tean	n Leader: Mer	nber:	
Visit	Leader:		
Date	:		
UNIVERSITY OF TECHNOLOGY			
CAMF	PUS DISCIPLINE	DATE	