ASIIN Accreditation Report

Bachelor's Degree Programmes

Bachelor of Engineering Science in Chemical Engineering

Bachelor of Engineering Science in Civil Engineering

Bachelor of Engineering Science in Electrical and Electronics Engineering

Bachelor of Engineering Science in Mechanical Engineering

Master's Degree Programmes

Master of Engineering in Chemical Engineering

Master of Engineering in Civil Engineering

Master of Engineering in Electrical and Electronics Engineering

Master of Engineering in Mechanical Engineering

Provided by

Charles Darwin University, Darwin, Australia

Version: 26.09.2014

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A About the Accreditation Process

Title of the degree Programme	**Labels applied for**[1]	**Previous accreditation**	**Involved Technical Committees (TC)**[2]
Bachelor of Engineering Science in Chemical Engineering	ASIIN, EUR-ACE® Label	--	01, 09
Master of Engineering in Chemical Engineering	ASIIN, EUR-ACE® Label	--	01, 09
Bachelor of Engineering Science in Civil Engineering	ASIIN, EUR-ACE® Label	--	03
Master of Engineering in Civil Engineering	ASIIN, EUR-ACE® Label	--	03
Bachelor of Engineering Science in Electrical and Electronics Engineering	ASIIN, EUR-ACE® Label	--	02
Master of Engineering in Electrical and Electronics Engineering	ASIIN, EUR-ACE® Label	--	02
Bachelor of Engineering Science in Mechanical Engineering	ASIIN, EUR-ACE® Label	--	01
Master of Engineering in Mechanical Engineering	ASIIN, EUR-ACE® Label	--	01

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes

[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology); TC 03 – Civil Engineering, Surveying and Architecture; TC 09 – Chemistry

Date of the contract: 29 April 2013 **Submission of the final version of the self-assessment report:** 24 March 2014 **Date of the onsite visit:** 22 and 23 May 2014 **at:** Darwin, Australia
Peer panel: Prof. Dr.-Ing. Burkhard Egerer, Nuernberg University of Applied Sciences; Prof. Dr. rer. nat. habil. Frank Gronwald, Hamburg University of Technology; Prof. Dr. Evamarie Hey-Hawkins, Leipzig University; Prof. Dr.-Ing. Haldor Jochim, Aachen University of Applied Sciences; Prof. Dr.-Ing. Paul J. Kühn, Stuttgart University; Prof. Dr.-Ing. Günter Axel Rombach, Hamburg University of Technology; Dipl.-Ing. Wolfgang Schemenau, formerly ALSTOM Power Generation
Representative of the ASIIN headquarter: Dr. Siegfried Hermes
Responsible decision-making committee: Accreditation Commission for Degree Programmes
Criteria used: European Standards and Guidelines as of 10 May 2005 ASIIN General Criteria as of 28 June 2012 Subject-Specific Criteria of Technical Committees 01 – Mechanical Engineering and Process Engineering, 02 – Electrical Engineering and Information Technology and 09 – Chemistry as of 9 December 2011, as well as of Technical Committee 03 – Civil Engineering and Surveying as of 28 September 2012 EUR-ACE Framework Standards for the Accreditation of Engineering Programmes as of 5 November 2008

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name & Final Degree	b) Mode of Study	c) Duration & Credit Points	d) First time of offer & Intake rhythm	e) Number of students per intake	f) Fees
Bachelor of Engineering Science in Chemical Engineering	Full time / part-time (internal[3] *or* distance learning[4] with intensive residential laboratory sessions)	6 semester 180 ECTS points / 12 semester 180 ECTS points	February intake 2013 / First semester (February intake) *or* Second semester (July intake)	2013: 10 2014: 24 2015: 36 2016: 39 2017: 43	$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,360 in 2013 (international students)
Bachelor of Engineering Science in Civil Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	6 semester 180 ECTS points / 12 semester 180 ECTS points	February intake 2013 / First semester (February intake) *or* Second semester (July intake)		$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,360 in 2013 (international students)
Bachelor of Engineering Science in Electrical and Electronics Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	6 semester 180 ECTS points / 12 semester 180 ECTS points	February intake 2013 / First semester (February intake) *or* Second semester (July intake)		$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,360 in 2013 (international students)
Bachelor of Engineering Science in Mechanical Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	6 semester 180 ECTS points / 12 semester 180 ECTS points	February intake 2013 / First semester (February intake) *or* Second semester (July intake)		$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,360 in 2013 (international students)
Master of Engineering in Chemical Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	4 semester 120 ECTS points / 8 semester 120 ECTS points	February intake 2012 / First semester (February intake) *or* Second semester (July intake)	2013: 52 2014: 68	$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,440 in 2013 (international students)

[3] Internal (on-campus)
[4] Distance learning (external)

a) Name & Final Degree	b) Mode of Study	c) Duration & Credit Points	d) First time of offer & Intake rhythm	e) Number of students per intake	f) Fees
Master of Engineering in Civil Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	4 semester 120 ECTS points / 8 semester 120 ECTS points	February intake 2012 / First semester (February intake) *or* Second semester (July intake)	2015: 81 2016: 102 2017: 112	$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,440 in 2013 (international students)
Master of Engineering in Electrical and Electronics Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	4 semester 120 ECTS points / 8 semester 120 ECTS points	February intake 2012 / First semester (February intake) *or* Second semester (July intake)		$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,440 in 2013 (international students)
Master of Engineering in Mechanical Engineering	Full time / part-time (internal *or* distance learning with intensive residential laboratory sessions)	4 semester 120 ECTS points / 8 semester 120 ECTS points	February intake 2012 / First semester (February intake) *or* Second semester (July intake)		$ 8,363 in 2013; 10% discount for up-front payment (Australian students) $ 21,440 in 2013 (international students)

For the Bachelor’s degree programmes in Chemical Engineering, Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering the self-assessment report states the following **intended learning outcomes**:

The Bachelor of Engineering Science has the following Course Learning Outcomes:

Course Learning Outcomes Bachelor of Engineering Science	
1	Demonstrate broad and coherent conceptual understanding of the mathematical, information science, physical and natural science disciplines that underpin engineering, as well as a sound knowledge of fundamental engineering principles and of the theory and practice of one of the disciplines of Chemical, Civil, Electrical and Electronics or Mechanical Engineering;
2	Analyse complex engineering problems and fluently apply appropriate engineering techniques and design processes
3	Develop creative problem solutions and conceive innovative approaches in developing and designing engineering systems;
4	Prepare high quality engineering documents and present a clear and coherent presentation of these to a range of technical and nontechnical audiences;
5	Acquire and evaluate research regarding new knowledge development within the engineering discipline and its social, cultural, environmental and legal context;
6	Exercise initiative, judgment, and autonomy in contributing as a member of an engineering team
7	Competently and confidently contribute to the development of society and the engineering profession, with a special emphasis on Northern Territory issues
8	Demonstrate a responsible, ethical and professional attitude regarding the role of engineers in society, including situations involving potentially adverse environmental and cultural impacts.
9	Work collaboratively to plan and execute project work or research to advance the scientific basis, technologies or practices within the engineering discipline broadly

The above learning outcomes are extracted from the CARP – Quality Assurance document for this course (refer to the following link for the complete document: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_BENGS.pdf).

Course Learning Outcomes and Unit Assessment Task Matrix

List the core and specialist units taught in the course and indicate (X) the course learning outcomes that will be assessed within each unit.

	Course Learning Outcomes								
Unit Code	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Common Units:									
CUC106 Design and Innovation: Communicating Technology	x	x	x	x		x	x	x	x
CUC107 Cultural Intelligence						x	x	x	
Core Units:									
ENG142 Concepts of Chemical Engineering	x	x	x			x			
ENG151 Statics	x	x	x	x		x			
ENG154 Engineering Foundations	x	x	x	x		x	x	x	
ENG174 Electrical Engineering	x	x	x			x			
SMA101 Mathematics 1A	x								
SMA102 Mathematics 1B	x								
ENG252 Dynamics	x	x	x	x		x			
PMO201 Project Management	x	x	x	x		x			x
SMA209 Mathematics 2A	x	x	x	x					
SMA211 Mathematics 2B	x	x	x	x					
ENG301 Engineering Research Project	x	x	x	x	x	x	x	x	x
ENG304 Engineering Design Project	x	x	x	x	x	x	x	x	x
ENG305 Safety, Risk and Reliability	x	x	x	x	x	x	x	x	
IPM300 Industrial Experience (0 credit points)	x	x	x	x	x	x	x	x	x
Specialist Units:									
Chemical Engineering Specialist Stream									
SCH101 Chemical Concepts	x	x				x			
SCH102 Organic and Inorganic Chemistry	x	x				x			
ENG246 Process Analysis	x	x	x	x		x			
ENG247 Fluid and Thermodynamics	x	x		x		x			
ENG364 Materials Engineering	x	x	x	x	x	x			
ENG341 Separation Process Principles	x	x	x	x	x	x			
ENG342 Instrumentation	x	x	x	x	x	x			
Civil Engineering Specialist Stream									
ENG212 Mechanics of Solids	x	x	x	x		x			
ENG215 Surveying and Construction	x	x	x	x		x			
ENG247 Fluid and Thermodynamics	x	x		x		x			
ENG364 Materials Engineering	x	x	x	x	x	x			
ENG267 Hydraulics and Soil Mechanics	x	x	x	x		x			
ENG311 Geomechanics	x	x	x	x	x	x			
ENG315 Engineering Computing	x	x	x	x	x	x			
Electrical and Electronics Engineering Specialist Stream									
ENG221 Analogue Electronics	x	x	x	x	x	x			
ENG223 Electrical Circuit Analysis	x	x	x	x		x			
ENG224 Electrical Machines and Power Systems	x	x	x	x		x			
HIT235 Digital Systems and Computer Architecture	x	x		x					
ENG325 Systems Modelling	x	x	x	x	x				
HIT332 Embedded and Mobile Systems	x	x	x	x	x				
HIT365 C Programming	x	x	x	x	x				
Mechanical Engineering Specialist Stream									
ENG212 Mechanics of Solids	x	x	x	x		x			
ENG235 Manufacturing	x	x	x	x		x			
ENG247 Fluid and Thermodynamics	x	x		x		x			
ENG315 Engineering Computing	x	x	x	x	x	x			
ENG325 Systems Modelling	x	x	x	x	x				
ENG342 Instrumentation	x	x	x	x	x	x			
ENG364 Materials Engineering	x	x	x	x	x	x			

The following **curriculum** is presented for the various Bachelor's degree programmes:

Appendix F.1 Study Plans - Bachelor of Engineering Science

Students Commencing in Semester 1

The Recommended Study Plans provided below are suitable for students commencing in semester 1, enrolling in a standard full-time load and meet the assumed knowledge - Stage 2 Mathematical Studies. Students who do not meet or are uncertain whether they meet the assumed knowledge should contact the course coordinator at engineering@cdu.edu.au or 08 8946 6457 to discuss their study plan.

The first year of study in Engineering Science is common to all specialisations with students selecting a specialisation in the second year of full-time study (Year 2).

Legend:	CU = Common Unit	CO = Core Unit	SE = Specialist Elective	E = Elective

COMMON FIRST YEAR for all engineering streams

Semester 1		**Semester 2**	
Year 1			
CUC106 Design and Innovation: Communicating Technology	CU	ENG142 Concepts of Chemical Engineering	CO
ENG151 Statics	CO	ENG252 Dynamics *(external students must attend on-campus residentials during the mid-semester study period)*	CO
ENG154 Engineering Foundations *(external students must attend on-campus residentials during the mid-semester study period)*	CO	ENG174 Electrical Engineering	CO
SMA101 Mathematics 1A	CO	SMA102 Mathematics 1B	CO

CHEMICAL ENGINEERING specialist stream

Semester 1		**Semester 2**	
Year 2			
ENG246 Process Analysis	SE	CUC107 Cultural Intelligence and Capability	CU
ENG247 Fluid and Thermodynamics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	PMO201 Project Management	CO
SCH101 Chemical Concepts *(external students must attend on-campus residentials during the mid-semester study period)*	SE	SCH102 Organic and Inorganic Chemistry *(external students must attend on-campus residentials during the mid-semester study period)*	SE
SMA209 Mathematics 2A	CO	SMA211 Mathematics 2B	CO
Year 3			
ENG304 Design Project *(external students must attend on-campus residentials during the mid-semester study period)*	CO	ENG303 Research Project	CO
ENG341 Separation Process Principles *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG305 Safety, Risk and Reliability	CO
ENG364 Materials Engineering *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG342 Instrumentation *(external students must attend on-campus residentials during the mid-semester study period)*	SE
Elective 1	E	Elective 2	E
		IPM300 Industrial Experience *(0 credit points)*	CO

CIVIL ENGINEERING specialist stream

Semester 1		Semester 2	
Year 2			
ENG215 Surveying and Construction *(external students must attend on-campus residentials during the mid-semester study period)*	SE	CUC107 Cultural Intelligence and Capability	CU
ENG247 Fluid and Thermodynamics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG212 Mechanics of Solids *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG364 Materials Engineering *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG267 Hydraulics and Soil Mechanics *(external students must attend on-campus residentials during the mid-semester study period)*	SE
SMA209 Mathematics 2A	CO	SMA211 Mathematics 2B	CO
Year 3			
ENG304 Design Project *(external students must attend on-campus residentials during the mid-semester study period)*	CO	ENG303 Research Project	CO
ENG311 Geomechanics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	PMO201 Project Management	CO
ENG315 Engineering Computing	SE	ENG305 Safety, Risk and Reliability	CO
Elective 1	E	Elective 2	E
		IPM300 Industrial Experience *(0 credit points)*	CO

ELECTRICAL AND ELECTRONICS ENGINEERING specialist stream

Semester 1		Semester 2	
Year 2			
ENG221 Analogue Electronics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	CUC107 Cultural Intelligence and Capability	CU
HIT235 Digital Systems and Computer Architecture	SE	ENG223 Electrical Circuit Analysis *(external students must attend on-campus residentials during the mid-semester study period)*	SE
HIT365 C Programming	SE	ENG224 Electrical Machines and Power Systems *(external students must attend on-campus residentials during the mid-semester study period)*	SE
SMA209 Mathematics 2A	CO	SMA211 Mathematics 2B	CO
Year 3			
ENG304 Design Project *(external students must attend on-campus residentials during the mid-semester study period)*	CO	ENG303 Research Project	CO
HIT332 Embedded and Mobile Systems *(external students must attend on-campus residentials during the mid-semester study period)*	SE	PMO201 Project Management	CO
ENG325 Systems Modelling	SE	ENG305 Safety, Risk and Reliability	CO
Elective 1	E	Elective 2	E
		IPM300 Industrial Experience *(0 credit points)*	CO

MECHANICAL ENGINEERING specialist stream

Semester 1		Semester 2	
Year 2			
ENG235 Manufacturing *(external students must attend on-campus residentials during the mid-semester study period)*	SE	CUC107 Cultural Intelligence and Capability	CU
ENG247 Fluid and Thermodynamics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG212 Mechanics of Solids *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG364 Materials Engineering *(external students must attend on-campus residentials during the mid-semester study period)*	SE	PMO201 Project Management	CO
SMA209 Mathematics 2A	CO	SMA211 Mathematics 2B	CO
Year 3			
ENG304 Design Project *(external students must attend on-campus residentials during the mid-semester study period)*	CO	ENG303 Research Project	CO
ENG315 Engineering Computing	SE	ENG305 Safety, Risk and Reliability	CO
ENG325 Systems Modelling	SE	ENG342 Instrumentation *(external students must attend on-campus residentials during the mid-semester study period)*	SE
Elective 1	E	Elective 2	E
		IPM300 Industrial Experience *(0 credit points)*	CO

Study plans are modified for students commencing in Semester 2 so as to provide for a suitable progression of modules.

In broad terms the levels of units indicate the following:

- 100 level – general foundation units for engineering study
- 200 level – specialist foundation units
- 300 level – constrained or defined scope specialist units for engineering practice at the level of technologist

For the Master's degree programmes in Chemical Engineering, Civil Engineering, Electrical and Electronics Engineering, Mechanical Engineering the self-assessment report states the following **intended learning outcomes**:

The Master of Engineering has the following Course Learning Outcomes:

Course Learning Outcomes Bachelor of Engineering Science - Master of Engineering	
1	Demonstrate advanced and integrated understanding of the complex body of knowledge that comprises the engineering discipline, including the mathematical, information science, physical and natural science disciplines that underpin engineering, extensive technical knowledge of engineering principles and practices, and expert specialised knowledge and technical skills in one of the disciplines of Chemical, Civil, Electrical and Electronics or Mechanical Engineering;
2	Critically analyse and synthesise information regarding complex engineering problems and fluently apply appropriate engineering techniques and design processes
3	Develop creative problem solutions and conceive innovative approaches in developing and designing complex engineering systems;
4	Prepare high quality engineering documents and present a clear and coherent presentation of these to a range of technical and nontechnical audiences;
5	Critically evaluate and synthesise research regarding new knowledge development within the engineering discipline and its social, cultural, environmental and legal context;
6	Exercise initiative, judgement and confident leadership skills in integrating the specialised knowledge available within an engineering team
7	Competently and confidently make leading contributions to the development of society and the engineering profession nationally and internationally, with a special emphasis on Northern Territory issues;
8	Demonstrate a leading role in promoting a responsible, ethical and professional attitude regarding the role of engineers in society, including situations involving potentially adverse environmental and cultural impacts;
9	Plan and execute project work or research to contribute significant advances to the scientific basis, technologies or practices within the engineering discipline;
10	Become leaders in industry and commerce through advanced and specialised professional skills, self-motivation and initiative;
11	Assume entry-level management roles through having a broad-based knowledge of contemporary engineering management tools and techniques;
12	Perform high-level leadership in industry and commerce through independence, self-motivation and initiative in project work.

The Master of Engineering consists of modular units, which contribute to the course outcomes as indicated in the Course Learning Outcomes and Unit Assessment Task Matrix below.

The aforementioned learning outcomes were extracted from the Course Accreditation and Re-accreditation Process – Quality Assurance (CARP-QA) document for this course, refer to the following link for the full document: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_MENGIN.pdf.

Course Learning Outcomes and Unit Assessment Task Matrix **Core Units and Specialist Units Only**												
List the core and specialist units taught in the course and indicate (X) the course learning outcomes that will be assessed within each unit.												
	Course Learning Outcomes											
Unit Code	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Core Units												
ENG417 Environmental Awareness and Sustainability	x	x	x	x	x	x	x	x	x	x		
PRT501 Professional Practice	x	x	x	x	x	x	x	x	x	x	x	x
PRT502 Project Management Tools and Techniques	x	x	x	x		x			x	x	x	x
PRT503 Entrepreneurship for Professionals	x	x	x	x		x			x	x	x	x
PRT505 Thesis (repeatable unit)	x	x	x	x	x	x	x	x	x	x		x
PRT506 Systems Engineering	x	x	x	x		x			x	x	x	x
PRT507 System Design Part A	x	x	x	x	x	x	x	x	x	x	x	x
PRT508 System Design Part B	x	x	x	x	x	x	x	x	x	x	x	x
PRT542 Risk and Reliability Management	x	x	x	x		x			x	x	x	x
Specialist Units:												
Chemical Engineering Specialist Stream												
ENG441 Separation Processes	x	x	x	x	x	x		x	x			
ENG442 Chemical Engineering Thermodynamics	x	x	x	x	x	x	x	x	x			
ENG443 Reactor Design	x	x	x	x		x		x	x			
ENG444 Hydrocarbon Processing	x	x	x	x	x	x	x	x	x			
ENG445 Process Control and Simulation	x	x	x	x	x	x		x				
ENG481 Applied Heat and Mass Transfer	x	x	x	x	x	x		x	x			
Civil Engineering Specialist Stream												
ENG412 Road and Traffic Engineering	x	x	x	x	x	x		x	x			
ENG462 Water Resources Engineering	x	x	x	x	x	x		x	x			
ENG466 Concrete Design	x	x	x	x	x	x		x	x			
ENG467 Steel Design	x	x	x	x	x	x		x	x			
ENG469 Structural Analysis	x	x	x	x	x	x		x	x			
PMO401 Engineering in Emergencies	x	x	x	x	x	x	x	x		x		
Electrical and Electronics Engineering Specialist Stream												
ENG421 Digital Signal Processing	x	x	x	x	x			x	x			
ENG429 Biomedical Engineering	x	x	x	x	x	x		x	x			
ENG471 Analogue Devices	x	x	x	x	x	x		x	x			
ENG473 Wireless Communication Systems	x	x	x	x	x	x		x	x			
ENG474 Power Systems Analysis	x	x	x	x	x	x		x	x			
ENG476 Control Systems	x	x	x	x	x	x		x	x			
Mechanical Engineering Specialist Stream												
ENG432 Dynamics of Engineering Systems	x	x	x	x	x	x		x	x			
ENG476 Control Systems	x	x	x	x	x	x		x	x			
ENG480 Applied Fluid Mechanics	x	x	x	x	x	x	x	x	x			
ENG481 Applied Heat and Mass Transfer	x	x	x	x	x	x		x	x			
ENG482 Engines and Turbomachinery	x	x	x	x	x	x		x	x			
ENG486 Machine Design	x	x	x	x	x	x		x	x			

The following **curriculum** is presented for the different Master's degree programmes:

Students Commencing in Semester 1

The Recommended Study Plans provided below are suitable for students commencing in Semester 1 and enrolling in a standard full-time load. Students enrolling in a reduced or part-time load should use the table as a guide to plan an individual program of study.

CHEMICAL ENGINEERING specialist stream

Semester 1		Semester 2	
Year 1			
ENG442 Chemical Engineering Thermodynamics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG441 Separation Processes *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG443 Reactor Design	SE	ENG481 Applied heat and Mass Transfer	SE
PRT502 Project Management Tools and Techniques	CO	PRT503 Entrepreneurship for Professionals	CO
Elective	E	PRT506 Systems Engineering	CO
		PRT501 Professional Practice *(0 credit points)*	CO
Year 2			
ENG444 Hydrocarbon Processing	SE	ENG445 Process Control and Simulation *(external students must attend on-campus residentials during the mid-semester study period)*	SE
PRT542 Risk and Reliability Management	CO	ENG417 Environmental Awareness and Sustainability	CO
PRT505 Thesis *(repeatable unit)*	CO	PRT505 Thesis *(repeatable unit)*	CO
PRT507 System Design Part A *(external students must attend on-campus residentials during the mid-semester study period)*	CO	PRT508 System Design Part B *(external students must attend on-campus residentials during the mid-semester study period)*	CO

CIVIL ENGINEERING specialist stream

Semester 1		Semester 2	
Year 1			
ENG467 Steel Design	SE	ENG462 Water Resources Engineering	SE
ENG469 Structural Analysis *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG466 Concrete Design *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG412 Road and Traffic Engineering	SE	PRT506 Systems Engineering	CO
PRT502 Project Management Tools and Techniques	CO	PRT503 Entrepreneurship for Professionals	CO
		PRT501 Professional Practice *(0 credit points)*	CO
Year 2			
PMO401 Engineering in Emergencies	SE	ENG417 Environmental Awareness and Sustainability	CO
PRT505 Thesis *(repeatable unit)*	CO	PRT505 Thesis *(repeatable unit)*	CO
PRT507 System Design Part A *(external students must attend on-campus residentials during the mid-semester study period)*	CO	PRT508 System Design Part B *(external students must attend on-campus residentials during the mid-semester study period)*	CO
PRT542 Risk and Reliability Management	CO	Elective	E

ELECTRICAL AND ELECTRONICS ENGINEERING specialist stream

Semester 1		Semester 2	
Year 1			
ENG421 Digital Signal Processing	SE	ENG473 Wireless Communication Systems	SE
ENG474 Power Systems Analysis *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG476 Control Systems *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG471 Analogue Devices	SE	PRT506 Systems Engineering	CO
PRT502 Project Management Tools and Techniques	CO	PRT503 Entrepreneurship for Professionals	CO
		PRT501 Professional Practice *(0 credit points)*	CO
Year 2			
PRT542 Risk and Reliability Management	CO	ENG417 Environmental Awareness and Sustainability	CO
Elective	E	ENG429 Biomedical Engineering	SE
PRT505 Thesis *(repeatable unit)*	CO	PRT505 Thesis *(repeatable unit)*	CO
PRT507 System Design Part A *(external students must attend on-campus residentials during the mid-semester study period)*	CO	PRT508 System Design Part B *(external students must attend on-campus residentials during the mid-semester study period)*	CO

MECHANICAL ENGINEERING specialist stream

Semester 1		Semester 2	
Year 1			
ENG432 Dynamics of Engineering Systems *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG481 Applied Heat and Mass Transfer	SE
ENG480 Applied Fluid Mechanics *(external students must attend on-campus residentials during the mid-semester study period)*	SE	ENG476 Control Systems *(external students must attend on-campus residentials during the mid-semester study period)*	SE
ENG486 Machine Design	SE	PRT506 Systems Engineering	CO
PRT502 Project Management Tools and Techniques	CO	PRT503 Entrepreneurship for Professionals	CO
		PRT501 Professional Practice *(0 credit points)*	CO
Year 2			
PRT542 Risk and Reliability Management	CO	ENG417 Environmental Awareness and Sustainability	CO
Elective	E	ENG482 Engines and Turbomachinery *(external students must attend on-campus residentials during the mid-semester study period)*	SE
PRT505 Thesis *(repeatable unit)*	CO	PRT505 Thesis *(repeatable unit)*	CO
PRT507 System Design Part A *(external students must attend on-campus residentials during the mid-semester study period)*	CO	PRT508 System Design Part B *(external students must attend on-campus residentials during the mid-semester study period)*	CO

Study plans are modified for students commencing in Semester 2 so as to provide for a suitable progression of modules.

In broad terms the levels of units indicate the following:

- 400 level – final level of technical specialist units preparing students for engineering practice at the level of professional engineer.

- 500 level – final level of design, research and management units preparing students for engineering practice at the level of professional engineer.

C Peer Report for the ASIIN Seal[5]

1. Formal Specifications

Criterion 1 Formal Specifications

Evidence:

- SAR
- "Characteristics of the Degree Programmes", see chapter B
- School of Engineering and Information Technology (SEIT) webpage (http://www.cdu.edu.au/engit/bengs)

Preliminary assessment and analysis of the peers:

Regarding the specialisations of the degree programmes to be accredited, four Bachelor's and four corresponding Master's programmes are identified as subject matter of the audit report at hand. The relevant formal specifications for those programmes have been properly provided. They are, for the most part, self-explanatory and in accordance with ASIIN accreditation criteria.

Overall the name of each degree programme is deemed to be appropriate considering the specialisation as part of the programme title. Thus the programme names apparently correspond to the respective curriculum. However, this does not apply for the intended learning outcomes since these are not specified for the specialisations but only generically defined for the Bachelor's and Master's level of education (see also chapter C-2.2).

Notably the programmes are implemented and offered using a range of different modes and pathways (full time and part-time through both on-campus and mixed mode distance education with intensive residential laboratory sessions). This way of delivery takes into account two heterogeneous aspects of higher education: An increasingly heterogeneity of applicants and students regarding their social, educational and/or professional background on the one hand, and a rapidly changing learning environment on the other. The

[5] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

University has taken on these topics through measures in both directions. By offering vocational education and training (VET) under one umbrella, the University also contributes to widening the opportunities of prospective students to transfer to the higher education system. And at the same time its efforts to delivery and improvement of quality of flexible learning is directed to the changing needs and demands of different student groups. Both strategies are generally commendable, in particular the so-called “Fleximode” approach to tertiary education, which has been explicitly stated by the audit panel of Australian Universities Quality Agency (AUQA). Nevertheless, the conditions and supporting processes for the degree programmes which are implemented and offered in such a manner need to ensure that the same level of teaching and learning is achieved as in more common, standard approaches. The various study modes and groups of students and applicants will therefore be addressed in the respective sections of this audit report.

The standard period of study for the full time and part-time mode accords with the requirements for European first and second cycle degree programmes, as envisaged for instance in the ECTS User’s Guide. Thereby it is acknowledged that the SEIT has shifted from an 8 semesters Bachelor honours-scheme to a European style 6 + 4 scheme without fully abandoning the 8 semesters Bachelor of honours programme at this stage. Reportedly, this is due to the internationalization strategy of the University and may be worthwhile with a view to student exchange from and to European higher education institutions (HEI).

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

Substantial information has been provided to the relevant formal aspects of the degree programme. The said criterion has therefore been met sufficiently.

2. Degree programme: Concept & Implementation

Criterion 2.1 Objectives of the degree programme

Evidence:

- Respective chapter of the SAR
- Stage 2 – Quality Assurance COURSE Proforma Bachelor Degree: AQF Level 7; see: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_BENGS.pdf
- Stage 2 – Quality Assurance COURSE Proforma Master Degree: AQF Level 9; see: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_MENGIN.pdf

- EQF – The European Qualification Framework for Lifelong Learning

Preliminary assessment and analysis of the peers:

The study objectives of the respective programmes have been broadly defined in regard to the aspired academic and professional qualification of graduates of the degree programmes under review. In principle, the University has demonstrated that the study aims *broadly* correspond to the European Qualification Framework (EQF) Level 6 for the Bachelor and Level 7 for the Master, respectively. *On first glance* the intended learning outcomes for the Bachelor's programmes, in particular, could be related to the corresponding Bachelor's level of qualification. This assessment will be further detailed in the following sections.

Criterion 2.2 Learning Outcomes of the Programme

Evidence:

- "Characteristics of the Degree Programmes", see chapter B
- Respective sections of the SAR
- Stage 2 – Quality Assurance COURSE Proforma Bachelor Degree: AQF Level 7; see: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_BENGS.pdf
- Stage 2 – Quality Assurance COURSE Proforma Master Degree: AQF Level 9; see: http://media.online.cdu.edu.au/engit/eurace/files/CARP_QA_MENGIN.pdf
- Discussions with representatives of the University [objectives, classification]

Preliminary assessment and analysis of the peers:

It is without doubt that the University has put emphasis on defining suitable learning outcomes for the Bachelor's and Master's degree programmes and mapping them against the relevant qualifications frameworks (Engineers Australia Stage 1 Competency Standard for Professional Engineers, AQF, EUR-ACE Framework Standards). Thus, it could be stated, at least at the level of the generic learning objectives, that the Course Learning Outcomes of the Bachelor's and Master's Programmes generally fit into the relevant qualification framework with regard to the level of qualification and the competences to be acquired.

This finding notwithstanding, programme-specific learning outcomes have not been developed yet (as could be derived from the documentation). As to that, learning objectives referring to the programme level need to describe, next to personal and social, non-technical competences, the engineering-specific core competences to be acquired in each programme. Currently there is no "qualification profile" or "competence profile" for the graduates of the Bachelor's programmes in Chemical Engineering, in Civil Engineering, in Electrical and Electronics Engineering, and in Mechanical Engineering nor for the graduates of the correlated Master's Programmes. Because learning outcomes have been defined in an almost generic way, the mapping of learning outcomes gives only general information on which engineering knowledge, skills and competences could be acquired in a certain programme and which module/s potentially contribute to this end. As a result, it appeared unclear whether a bundle of module learning outcomes combines to or fits into a programme-specific competence profile. With a view to the composition of the respective curricula, the intended learning outcomes and the content of the modules, it generally can be concluded that the Bachelor's programmes are, in the first place, aimed at a broad, interdisciplinary engineering education (common first year), only moderately deepening the disciplinary-specific engineering competences in the particular specialisation field of Chemical Engineering, Civil Engineering, Electrical and Electronics Engineering or Mechanical Engineering. Consequently, the discipline-related engineering competences do not achieve the depth that might be expected for a pure disciplinary curriculum in those specialisations. The Master's programmes, on the other hand, are obviously not designed to broaden general engineering competences but to deepen the relevant disciplinary-specific competences. In doing so, however, the respective curriculum of the four Master's programmes also has to provide for those disciplinary competences which are normally part of a Bachelor's programme in the respective disciplinary field. This is why the curricula for the study programmes are still considered to leave room for improvement (see below, chapter C-2.6).

All in all, the learning objectives need to be stated for each specialisation thus indicating more precisely the skills and competences graduates should have acquired after completing the respective study programme ("qualification profile"). These programme-specific learning outcomes should also be communicated and made accessible to students and graduates as well, the latter through integration in the Australian Higher Education Graduation Statement (Diploma Supplement; see for the chapter C-7.2).

Although not programme-specific in the sense indicated above, the generic learning objectives for the different specialisations of the Bachelor's and the Master's Engineering programme (*each of them conceived as an individual study programme in this report*) and the mapping of related learning outcomes at the module level are considered suitable to illustrate how the engineering-specific knowledge, skills and competences of the Subject Specific Criteria (SSC) of the relevant Technical Committees of ASIIN are affected. This in turn is a precondition with respect to the question whether the programmes under review qualify for the award of the EUR-ACE® label. In particular, those mappings identify the modules (course units) which contribute to the acquisition of the engineering-specific learning outcomes in the areas of "Engineering Analysis", "Engineering Design" and "Engineering Practice". Considering that, it can be stated that the nine learning outcomes defined for the Bachelor level and the twelve learning outcomes identified for the Master level *broadly, but with reservation,* cover the relevant engineering-specific learning objectives in the areas of "Knowledge and Understanding", "Engineering Analysis", "Engineering Design", "Investigations and Assessment", and "Engineering Practice" as required by the SSC 01 – Mechanical Engineering/Process Engineering (Bachelor's and Master's programmes Chemical Engineering and Mechanical Engineering), the SSC 02 – Electrical Engineering/Information Technology (Bachelor's and Master' programme Electrical and Electronics Engineering) and the SSC 03 – Civil Engineering, Surveying and Architecture (Bachelor's and Master's programmes Civil Engineering). For further details see the "Course Learning Outcomes and Unit Assessment Task Matrices" above in chapter B. Whether the said engineering-specific learning outcomes are implemented not only formally but also substantially in the respective curriculum, will be addressed in chapter C-2.6.

In this context, it is noteworthy that the University has integrated an additional mandatory Research Project and a Design Project with respect to Design and Research competences of the students, thereby replacing two formerly free electives. Cross-referencing the learning outcomes at programme and module level with the requirements of the respective SSC and, pari passu, the EUR-ACE® learning objectives for first and second cycle degree programmes thus leads to the impression of generally comparable learning objectives. However, it should also be noted at this point that fundamental knowledge (Bachelor's programmes Electrical and Electronics Engineering and Chemical Engineering), methodological competences (Bachelor's programme Mechanical Engineering), design competences (Bachelor's programme Civil Engineering) as well as competencies in the main areas of the respective specialisation (Master's degree programmes) are still found missing to some degree. This argument will be further elaborated in chapter C-2.6.

It is appreciated that the University in its top down approach to course development reportedly utilises the expertise of external engineering education consultants but also feedback from industry through discipline specific Course Advisory Groups and the Industry Advisory Board. Besides the structured feedback of the students in the course of the quality assurance processes, this is another effective instrument of involving relevant stakeholders into the process of course development, thus keeping up with current developments in the job market and industrial environment.

Criterion 2.3 Learning outcomes of the modules/module objectives

Evidence:

- module descriptions ("unit outline"); distributed electronically to students enrolled in the module/unit at the start of the semester (including, inter alia, the unit learning outcomes and their contribution to the course learning outcomes)
- "unit information"; accessible through the unit database, course database and course specific web pages

Preliminary assessment and analysis of the peers:

The module descriptions ("unit outline") show considerable efforts of the SEIT and its teaching staff to adequately substantiate the course overall learning outcomes. In general, the expected learning outcomes cover the unit content plausibly and in a manner that can reasonably be assessed in the foreseen exams. Additionally the "unit outlines" (module descriptions) transparently document how the respective modules contribute to the overall course learning objectives.

It is particularly commendable that each unit outline also embraces a short classification of the unit within the curriculum as well as meaningful information about "Teaching and Learning Strategies", details of assessment, and conditions for both internal and residential students (all in conjunction with relevant internet links for users).

Since the unit outlines give very detailed and lengthy information about the conditions and framework of each unit, it is understandable that they are distributed only to students enrolled in the module at the beginning of the semester, whilst a brief summary of the relevant unit information is generally accessible through the websites of the SEIT or alternatively through the related unit database of the University.

Though overall complying with the requirements of ASIIN general criteria, it has been found that the competences in "Engineering practice" are poorly described compared to the other engineering-specific competences (see for instance modules ENG 154, ENG 235, ENG 311). It therefore would make sense to revise the unit learning outcomes with a particular view to this point.

Criterion 2.4 Job market perspectives and practical relevance

Evidence:

- Respective chapter in the SAR

- Engineers Australia Policy Note: Changes in the NT Engineering Labour Market, November 2012; see https://www.engineersaustralia.org.au/sites/default/files/shado/Representation/Policy_Notes/nt_2011.pdf
- Engagement in the Ichthys LNG Project, in cooperation with major companies for designing an delivering oil and gas processing plants; see http://www.ichthysproject.com/about
- Engineering practice-related parts of all courses: laboratory work, projects (Design Project and Research Project in the Bachelor's programmes, System Design Part A and B and Thesis in the Master's programmes)
- Description of expected learning outcomes in the respective unit outlines

Preliminary assessment and analysis of the peers:
It can be assumed from the information at hand that there is a significant demand on the labour market for chemical, civil, electrical and mechanical engineers on both the Bachelor's and Master's level. The University's engagement in industry-led major community projects, like the Ichthys LNG Project, ensures close ties to regional as well as internationally oriented companies. Along with the participating industry members in the institutionalized bodies of exchange between the University and respective industrial branches (Industry Advisory Board and Course Advisory Groups), this enables the School for Engineering and Information Technology to further develop the programmes along the lines of the technological demands, while also providing pathways to industrial internships that are a mandatory part of the Bachelor's and the Master's study programmes alike.

Overall, the practical training in the Bachelor's and Master's programmes under consideration has been found appropriately linked to professional practice. Thus, it can be assumed that graduates of the said programmes are sufficiently prepared to relate to engineering tasks in real-live situations. In particular, the 12 weeks work experience component of both the Bachelor's and the Master's programmes do not only form an obligatory part of students' course plan but are also – not least from the perspective of programme coordinators – a central building block for the practical experience of graduates. Actually the university puts into effect the terms and conditions for conducting the practical placements, at times also providing support in finding adequate companies as cooperation partners, but, as a general rule, leaves the organisation, conduct and compliance with engineering quality standards to the respective host company. Through reserving the right to approve of the company adviser who, in turn, has to define adequate engineering tasks for the students and to guarantee the quality of the reports, the SEIT essentially *externalizes* its very own educational task. However, the hurdle status of the work experience units (successful completion as a requirement for the graduation or even for admission to certain other units, conditions relating to quality standards) is inconsistent with the SEIT's retreat from assuming *full responsibility for the quality assurance of the internship* through an adequate supervision by its teaching staff. Integrating the work experience into the curriculum in a meaningful way would require the SEIT to take direct responsibility for counselling, supervising and, generally, assuring compliance to engineering quality standards. The SEIT will have to make adjustments accordingly.

The additional workload, the students have to bear for the mandatory internship, is not considered a problem by the students. Therefore, it is deemed reasonable that the University has decided to award no credit points for it, reserving these credit points for the theoretical units of each programme instead.

With a view to the students' experience in engineering practice, it is also noticed and explicitly welcomed that external students are required to use the mid-semester study period for intensive residential laboratory work on campus. The laboratory works of usually one week's duration were described by external students as intensive and highly instructive. Apparently – as expected – these practical works are to a great extent prepared in advance, saving students' time for organizing experiments from scratch. Therefore, regarding the lab-preparation of external students it is noteworthy that the pre-lab exercises (on-line quiz) must be completed regularly as per the due date set. Furthermore, it is important to note that details of the laboratory work will also be provided in the SCH101 Laboratory Manual given during the intensive lab session. As far as laboratory work requires external students to pass intense on-campus phases, this applies also for the Design Projects Bachelor and Master students are expected to conduct. The distinctive features of the said practical units can be seen in the respective unit outlines. However, with regard to the laboratory work in particular, this description might be somewhat more detailed (see for that above, chapter C-2.3).

Criterion 2.5 Admissions and entry requirements

Evidence:

- Information about admission requirements for Undergraduate and Postgraduate study programmes, for national and international applicants through the University's webpage: http://www.cdu.edu.au/prospectivestudents/studyingatcdu/entryandapplicationrequirements; http://www.cdu.edu.au/school-leavers/admission-requirements; http://www.cdu.edu.au/international/future-students/entry-requirements

- “Higher Education Coursework Admission Policy”, 27 Sep 2013 (pol-049), p. 4f.
- “Common Course Rules – Bachelor Degree”, 06 Mar 2013 (rul-003), p. 3
- “Common Course Rules – Masters Degree by Coursework”, 06 Mar 2013 (rul-007), p. 3
- Standard form “Higher Education Application for Exemption”, available at: http://www.cdu.edu.au/sites/default/files/student-portal/docs/he113.pdf
- Standard form “Cross Institutional Enrolment – Approval for Outgoing CDU students”, available at: http://www.cdu.edu.au/sites/default/files/student-portal/docs/he110.pdf
- Grading Policy [contains i.a. information about credit transfer], 06 Feb 2013 (pol-017); available at: http://www.cdu.edu.au/governance/policies/pol-017.pdf

Preliminary assessment and analysis of the peers:

The University’s and the SEIT’s admission rules have been discussed and, in principle, been considered adequate to serve their function in the framework of quality assurance, i.e. facilitating the achievement of the intended quality objectives and expected learning outcomes. This is all the more noteworthy with a view to the pathways to higher education, explicitly addressed in the University’s strategic outreach to applicants with quite different social and educational backgrounds.

As to that, the vocational education and training activities of the University seem very impressive and supportive. Not least, they offer a multistage pathway to Undergraduate programmes for those applicants who fall short of some of the admission requirements for these programmes (for instance the so-called Tertiary Enabling programme). A transition rate of about 12% – as reported in the audit discussions – appears to be a strong argument in that respect.

As for the Master’s programmes, it could be observed that the admission requirements as published on the webpage of the SEIT explicitly refer to a Bachelor’s degree in the respective specialisation. Although this could not be traced in the above cited “Common course rules”, it is assumed to be an obligatory principle. Nevertheless a brief comment of the University to that point would be appreciated.

It is also acknowledged that the University recognizes prior learning achievements through credit transfer (“exemption”) and has put in place rules for applications to this end. This involves pathways from vocational education and training to higher education as well as credit transfer for units completed at other universities (“Cross institutional enrolment”).

Criterion 2.6 Curriculum/Content

Evidence:

- Curricula, see “Characteristics of the Degree Programmes” above, chapter B
- Unit outlines; distributed electronically to students enrolled in the unit, see chapter C-2.3
- unit information; see http://stapps.cdu.edu.au/f?p=100:20:3847719079801530::NO

Preliminary assessment and analysis of the peers:

All in all, the curricula of the degree programmes under consideration correspond to the (generic) course learning outcomes. This is to say that overall those learning objectives are addressed in a comprehensible manner through the implementation of the curricula in their present form. And it also means, as indicated above (see chapter C-2.2), that engineering-specific learning outcomes could be achieved by graduates of the programmes which *to a certain extent* are equivalent to the exemplary learning outcomes in the respective SSC, especially with regard to the fields of “Fundamental Engineering Knowledge”, “Engineering Analysis”, “Engineering Design” and “Engineering Practice”. Nevertheless, the structure of the Undergraduate programmes, featuring a broad engineering education in the first year of study, results in some subject-specific shortcomings of each individual programme which might have been avoided, had the course learning outcomes been identified in a *programme-specific* (not only generic) manner from the outset.

Though the students considered the common engineering units of the first study year as a great strength of the programmes, these units also account for the later beginning with the fundamental and core subjects of the respective engineering discipline, thus leaving less time for establishing the disciplinary groundwork that lays at the basis of the employability of the graduates.

Concerning the Bachelor’s programme in Chemical Engineering, it could be observed that, for instance, the areas of Thermodynamics or Reactor Design which usually form part of the Bachelor’s curriculum are included as mandatory specialization courses in the Master’s programme in Chemical Engineering only. As to that, programme coordinators generally pointed out the deliberate decision to endow students with broad engineering competences before starting the specialized engineering education (being mainly reserved for the Master’s programme). This argument confirms doubts regarding a Bachelor’s programme that essentially needs to equip students with knowledge, skills and competences necessary to carry out engineering-related tasks in their discipline. It is therefore concluded that, apart from Thermodynamics or Reactor Design competences, students' knowledge of chemical engineering fundamentals and their ability to make use of it with regard to engineering applications should be enlarged.

With regard to the Bachelor's programme in Civil Engineering, a careful look at the unit outlines of the curriculum reveals a deficit in civil engineering design competences, for instance in the field of steel and concrete construction. While programme coordinators argued that usually such design work would not fall within the scope of engineering activities graduates are expected to carry out, this contradicts the framework of exemplary learning outcomes identified for graduates of Civil Engineering Bachelor's programmes in the SSC 03 – Civil Engineering, Surveying and Architecture of ASIIN. Furthermore, for this study programme, the mapping of learning outcomes in the "Course Learning Outcomes and Unit Assessment Task Matrix" turns out to be somewhat vague and should be reconsidered. As a result, engineering design competences should be enlarged in the Bachelor's Degree Programme in Civil Engineering.

As to the Bachelor's programme of Electrical and Electronics Engineering, it is the predominant impression that fundamentals of Electrical Engineering, like basics in Physics, Theory of Fields and Waves, or Control Theory, as well as of Information Technology (like Communication Technology and Communication Networks) are missing or at least barely represented in the curriculum of the programme. Should that be due to structural constraints following the decision for a broad engineering education in the first study year, as programme coordinators stressed in the audit discussions, this might be another argument for re-considering this concept in light of the expected accreditation of the programmes as qualifying for the engineering profession. If the name of the Bachelor's programme in Electrical and Electronics Engineering is to reflect the curriculum convincingly, it must be assured that students are familiar with the foundations and possible applications of Engineering Electromagnetics (Vectoranalysis, Fields and Waves; possible applications in Electrical Machines and Radiocommunication). In a similar vein the curriculum of the Master's programme in Electrical and Electronics Engineering misses out on some of the core subject areas of the disciplinary field as described in the programme's name, in particular competences in the fields of Communication Architecture and Protocols as well as Energy Transmission. These competences should also be considerably strengthened in order to achieve the learning outcomes of the relevant SSC 02 – Electrical Engineering and Information Technology at the intended qualification level.

A close look at the curriculum of the Bachelor's programme in Mechanical Engineering leads to the expectation that graduates presumably will lack some important methodological competences for conducting fundamental engineering tasks in the mechanical engineering profession: students should generally be able to apply methodological competences of engineering to mechanical technology of metallic materials (forging, casting, welding etc.), design and manufacturing of machine parts, design and construction of machinery, and operating behaviour of different machines. The University should, therefore, take actions aiming at increasing these competences.

As a result of the specific structure of the Bachelor’s degree programmes (“Specialisations” in the wording of the University), the curricula of the correspondent Master programmes to some extent impart subject-related knowledge, skills and competences that are often acquired in a first cycle programme and followed up in second cycle studies (see also above, chapter C-2.2). Consequently, this occurs at the expense of the *depth* in which the programme-specific fields of knowledge are covered and which the curricula of the Master’s programmes are explicitly aiming at, instead of embracing the respective discipline in *breadth*. As a result, competences in the main areas of the discipline should be enhanced in the Master’s programmes under review in order to ensure that the expected competences correspond to the master level.

Since it may be difficult to arrange for this without revising the concept of the Bachelor’s programmes (broad engineering education, common first year), the aim of generally increasing the depth of knowledge, skills and competences in the respective disciplinary field at master level may be primarily achieved through a deliberate shifting of course units and/or tailoring of unit size, thereby leaving room for additional subjects to be added to the Master’s programmes. In the Chemical Engineering Master’s programme this might result in specialised skills and competences of students in the fields of, for instance, Process Simulation, Micro Reaction Design or Electrochemical Engineering. With respect to the Civil Engineering Master’s programme, it is suggested specifically to enlarge students’ competences in the area of Geotechnical Engineering. Regarding the Master’s programme in Mechanical Engineering deepening competences in subject areas like HVAC design for different applications, Acoustics with regard to plants and environment as well as Patent and other intellectual property should be considered.

As another way to implement necessary changes in the structure and content of the curricula, consideration might be given to a revision of the catalogue of electives aiming specifically at strengthening disciplinary competences.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

At present, it must be stated that not all requirements of the above said criterion have been fulfilled satisfactorily. Concerning programme-specific learning outcomes and related components of the respective curriculum in particular, major improvements need to be put in place so as to ensure that the curriculum and the intended competence profile of each programme match up at the level of education sought. At the same time, it should be acknowledged that the SEIT seemingly received the peers' critical comments on certain aspects of the programmes with respect to learning outcomes and disciplinary content in a constructive and open-minded manner. Meaningful steps to enact modifications/revisions accordingly are proposed, and a realistic time line for implementing those modifications/revisions has also been announced.

Unless these propositions and announcements have been implemented verifiably, it is deemed indispensible that learning objectives for all programmes under review are defined programme-(specialisation-)specific in the sense of indicating more precisely the skills and competences graduates should have acquired after completing the respective study programme ("qualification profile"). These *programme-specific* learning outcomes also need to be communicated and made accessible to students. Their necessary notification in the framework of the Australian Higher Education Graduation Statement (AHEGS) is referred to in chapter C-7.

It has been stated already that the structure of the Bachelor's programmes, particularly, while combining a broadly conceived engineering education with disciplinary specialisations somewhat resembles the generic definition of the respective learning objectives. It therefore will be necessary not only to re-formulate these learning objectives but also to re-structure the curriculum of the respective programmes in such manner that they constitute truly discipline-specific Bachelor's programmes. Thus, concerning the Electrical and Electronics-Bachelor's programme, it must be assured that students are familiar with the foundations and possible applications of Engineering Electromagnetics. With respect to the Bachelor's programme in Mechanical Engineering, students' ability to apply methodological competences of engineering to specific machines and equipment needs to be enlarged. Regarding the Bachelor's programme in Civil Engineering, it is necessary to extend students' civil engineering design competences. Eventually, concerning the Bachelor's programme in Chemical Engineering, the students' knowledge of chemical engineering fundamentals (Thermodynamics in particular) and Reactor Design as well as their ability to make use of it with regard to engineering applications need to be enlarged.

Admittedly, it will take considerable efforts to carry through the curricular modifications that meet the said requirements. Otherwise, as has been argued in the preliminary assessment, it is without doubt that the SEIT has the means at hand to successfully implement such changes. Possible solutions appear even to be obvious (like the proposition of a deliberate shifting/tailoring of course units in the Bachelor's and Master's programmes respectively). Considering thoroughly whether the necessary modifications can be carried out in the comparatively short term reserved for fulfilling requirements, it is concluded that the SEIT has the necessary capacities to do so, especially when taking into account its comment on the issue. For the same reason, a suspension of the procedure of the Bachelor's programmes is considered to be inappropriate and possibly damaging to the development of the programmes.

Along with the modifications in the Bachelor's programmes, changes in the curricula of the Master's programmes are also deemed necessary in order to acquire the corresponding learning outcomes at the level sought. This finding is – by analogy with the Bachelor's programmes – subject to a *programme-specific* reformulation of the learning objectives of each Master programme – an argument which has been unfolded in detail above. In consequence, concerning the Master's programme Electrical and Electronics Engineering, competences of students in the fields of Communication Architecture and Protocols as well as Energy Transmission need to be increased. With regard to the remaining Master's programmes, competences in the main areas of the respective discipline need to be enhanced in order to ensure the achievement of the related learning outcomes at the intended depth.

The informative and, overall, well-drafted unit outlines (module descriptions) have been acknowledged in detail in the preliminary assessment. Minor deficits have been detected and should be worked on (i.e. clarification of the learning outcomes to be achieved in the field of "Engineering practice" as well as of the structure and conduct of the laboratory work). Thus, continually improving the unit outlines along these lines is found to be recommendable and will be evaluated in the course of the re-accreditation process. The SEIT's constructive comment in that direction is worthwhile.

Concerning the industrial placement units in the Bachelor's and Master's programmes, the SEIT's additional comments are welcomed. In its commentary the SEIT stresses that it takes full accountability for the quality assurance of the internship. Accordingly, this would include guidance and counselling as well as approval of a placement plan before commencing the internship, and also the assessment of the final report by the unit coordinator after finishing the placement. In contrast to that, the SEIT expects the day-to-day workplace supervision to be reasonably undertaken by the workplace adviser, who, in turn, must be approved by the SEIT. This statement apparently misses the main point of the peers' criticism. It has been acknowledged beforehand that the SEIT "puts into effect the terms and conditions for conducting the practical placements", including all measures taken with regard to the organisation and conduct of the internship, before commencing and after finishing it. However, missing in the SEIT's supervising activities, explicitly at least, are the guidance and supervision through the SEIT's professors *during* the students' industrial placement. While it may be easily conceded that the day-to-day supervision in the workplace should be undertaken by the workplace supervisor, it should also be clear that taking full responsibility would also include support, advice and, in this understanding, responsible supervision of the students *in the workplace*. This notwithstanding, it can be inferred from the SEIT's comments that the students could get advice and counselling even during their practical placement, if needed. Since students didn't complain about the SEIT's negligence of its duty of supervision with respect to the industrial placement, and since the SEIT is obviously keen to assure the quality of the industrial placement through appropriate measures, a requirement to this end, which previously has been found necessary, seems to be dispensable.

As to the admission requirements, the SEIT's explanation of why it is omitted in the common course rules for admission to Master's level programmes at CDU to explicitly state the requirement of the completion of a Bachelor's degree in the same specialisation as the intended study at Master's level, is noticed. However, it is taken for granted that for the Master's degree programmes under consideration this requirement prevails, as can be concluded from the information on the SEIT's websites.

3. Degree Programme: Structures, Methods & Implementation

Criterion 3.1 Structure and modularity

Evidence:

- Respective chapter of SAR
- Study plans of the Degree Programmes, see "Characteristics of the Degree Programmes", above chapter B
- Unit outlines / unit information
- "Common Course Rules – Bachelor Degree", 06 Mar 2013 (rul-003), "Common Course Rules – Masters Degree by Coursework", 06 Mar 2013 (rul-007) concerning Definition "unit" – equation to "module"
- Information for Outgoing students, available at: http://www.cdu.edu.au/prospectivestudents/sb-outgoing-exchange#europe
- Information for Incoming students, available at: http://www.cdu.edu.au/international/study-abroad

Preliminary assessment and analysis of the peers:

The University has its degree programmes modularized in such manner that the modules of each programme ("course units") can be considered as coherent teaching and learning units. It is appreciated that all practical components of each programme (such as laboratory practice) are included in the relevant units of the course to ensure that the practical experience is synchronised with the theoretical components throughout the course.

Since all programmes can be commenced either in the first or in the second semester, the University has adapted the respective study plans so as to make sure that the related sequence of units is consistent in itself and that students generally possess the necessary pre-requisites with regard to knowledge, skills and competences. All in all, these arrangements seem to be working well.

The general statement, however, that the part-time mode of studying the Bachelor's or Master's programmes should be twice the full time standard duration of study cannot be verified at the moment because no study plan for part-time students is available. Therefore, study plans for the part-time mode of the study programmes under review should be submitted subsequently (along with the comments on this report). It should also be indicated whether and how these study plans are accessible to the relevant stakeholders (students in particular).

Size, content and duration of the course units (modules), as well as the provisions put in place for recognizing the achievements of prior learning at other Higher Education Institutions (HEIs) generally allow for a flexible combination of modules/units as well as for study periods abroad without loss of time. In this respect, it is welcomed that the SEIT already lists a number of pre-approved cross institutional enrolment units in engineering for students who would like to take an elective unit in a specialised field not offered at CDU (arrangements exist with several Australian universities). It is also considered positively that the listed units are available externally through distance learning. While CDU has already arranged cooperation agreements with a great many of international universities, reportedly exchange programmes do not exist at present in the engineering field at present. Thus it is recommended that the SEIT should support the internationalization strategy of CDU by promoting and assisting students in studying abroad (for instance through cooperation agreements with international HEIs).

Criterion 3.2 Workload and credit points

Evidence:

- Respective chapter of SAR

- Total ECTS credit points for the study programmes and standard period of study, see “Characteristics of the Degree Programmes” above, chapter B
- “Common Course Rules – Bachelor Degree”, 06 Mar 2013 (rul-003), “Common Course Rules – Masters Degree by Coursework”, 06 Mar 2013 (rul-007) concerning Definition “Credit point”, “Standard load”
- Discussions with students

Preliminary assessment and analysis of the peers:
CDU has put in place a credit point system which implies an expected standard student workload of 80 (Australian) credit points per year, which is 40 (Australian) credit points per semester. The course units are mostly worth 10 (Australian) credit points. Transferred into the ECTS credit point system this results in equating 1 Australian credit point to 0.75 ECTS credit points. The units then would be usually worth 7.5 ECTS credit points, on the assumption that students study 12 hours *per* unit *per* week over a semester of 16 weeks, and that 1 ECTS credit point corresponds to 25 hours of student work. However, in the documentation only the Australian credit point system is referred to. Apart from the SAR, apparently no reference is made to the European Credit Transfer System (ECTS) in any documentation or publication used by the University. Consequently, the ratio between the workload calculations in the two systems is not communicated externally, in particular to stakeholders in Europe. However, this would prove immensely helpful if CDU wants to broaden the strategic outlook of its internationalization strategy to the European Higher Education Area. It therefore would make sense that CDU finds a way to transparently and comprehensibly communicate the credit point system in use to relevant external stakeholders.

When asked about the uniform allocation of credit points to the heterogeneous course units, the students considered the distribution of credits as overall adequate, although deviations with regard to individual modules/units did occur, due to the relatively incomparable content of different units and the varying individual learning behaviour. On principle, this applies also to distance learning students who are expected to study 12 hours *per* week through self-study, interaction with multimedia presentations, interactive Collaborate sessions, Discussion Board postings, on-line group activity, etc. During the discussions the distance learning students agreed to the full-time students’ assessment concerning workload. Nevertheless, as no quantitative data source is available to appraise the factual weight of the deviations mentioned above and possible adjusting measures of the SEIT, it may be helpful to continuously assess the actual student's workload for each educational component and to adjust the credit point allocation or the content of the module accordingly.

With regard to the allocation of credit points, it is taken into account that credit points are only awarded upon successful completion of a unit.

As has been mentioned in a previous chapter (see above, C-2.4), the SEIT does not award credit points for the mandatory work experience in both the Bachelor's and the Master's programmes. This is not considered disputable for reasons detailed elsewhere in this report (see above chapter C-2.4).

Criterion 3.3 Educational methods

Evidence:

- Respective chapter of the SAR
- module descriptions
- on-line study platform "Learnline", see: http://learnline.cdu.edu.au/index.html and http://learnline.cdu.edu.au/support/
- Discussion rounds with teaching staff as well as full-time and distance learning students

Preliminary assessment and analysis of the peers:

Overall, the teaching methods used for implementing the didactical concept seem to be appropriate to support the attainment of the intended learning objectives.

The discussions with full-time as well as distance learning students and teaching staff of CDU largely confirmed the favourable picture of the didactical concept. It is highly appreciable that the SEIT's didactical concept is committed to approach both the needs of full-time and distance learning students. The general use of and access to on-line communication technologies, in particular the learning platform "Learnline", and also the mandatory residential mid-term weeks in which distance learning students have to participate, do encourage active student participation and interaction between distance and internal students. As distant learners confirmed, the combination of distance learning through the intelligent use of the learning platform and those residential phases contribute to becoming independent learners, taking responsibility for pacing their own studies and meeting deadlines.

The expectation that small class sizes would encourage student engagement and personal interaction with staff has been vividly confirmed during the audit discussions and on-site inspection of the institution and laboratories.

Regarding the distance learning students specifically, the integrative and learner-centered didactical approach appears to be significantly supportive in attaining the intended learning objectives. This applies to the technological infrastructure and support service during the self-study periods as well as the residential phases.

In general, a fair ratio of contact hours to self study is implemented in the study programmes, thus contributing to the achievement of the defined objectives.

The proposed broad catalogue of electives, which does not distinguish between technical and non-technical subjects, provides students with the opportunity to develop an individual focus in the disciplinary field of the chosen study programme. Nevertheless, restrictions with respect to the individual disciplinary competence profile might make sense, as has been argued elsewhere in this report (see chapter C-2.6).

Criterion 3.4 Support and advice

Evidence:

- Respective chapter of the SAR
- Academic Language and Learning Success Programme (ALLSP) - Assignments and study skills help; see: http://www.cdu.edu.au/academic-language-learning/allsp
- External Student support; see: http://www.cdu.edu.au/current-students/external-student-support
- Researching skill tutorial; see: http://www.cdu.edu.au/current-students/external-student-support
- Student support for Learnline; see: http://www.learnline.cdu.edu.au/support/index.html
- IT support; see: http://www.cdu.edu.au/itms/contactus
- Careers and Employment; see: http://www.cdu.edu.au/equity-services/careers-employment
- Office of Indigenous Academic Support; see: http://www.cdu.edu.au/study/indigacadsupport.html
- Student counseling; see: http://www.cdu.edu.au/equity-services
- Disability support; see: http://www.cdu.edu.au/equity-services/disability-services
- Support by Theme Leaders of Engineering and Unit Coordinators

Preliminary assessment and analysis of the peers:

The University has put in place abundant institutional and organizational arrangements for counseling and advice of students. The efforts to support indigenous students and other distinctive student groups are exemplary. Students' comments reveal not only a well-received system of counselling and advice, but also a remarkably trusting cooperation between students and staff.

Especially with regard to the distance learning mode, the teaching and learning forms adopted for these engineering programmes, their technological base and the accompanying personal support and advice, combine to a well-working and student-friendly study environment.

This overall positive impression has been explicitly confirmed in the discussions with students.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The sub-criteria of the above mentioned criterion are considered to be sufficiently fulfilled for the most part. However, there are still some deficits left which should be removed. Regarding this, the SEIT's comments are, where applicable, constructive but provisional in essence, and therefore of no immediate effect.

Therefore, it is regarded indispensable that the credit point system in use shall be made transparent and comprehensible to relevant external stakeholders. Additionally, for the reasons stated above, supporting the University's internationalization strategy by promoting and assisting students in studying abroad is deemed recommendable. With regard to an adequate credit point/workload-ratio it also appears to be commendable to continuously assess the actual student's workload for each educational component and to adjust the credit point allocation or the content of the module accordingly.

It is appreciated that part-time study plans for the degree programmes are available through the SEIT's websites already. In principle, these plans are found to be adequate.

As to the mandatory industrial placement, final conclusions have been drawn in chapter C-2.

4. Examination: System, Concept & Implementation

Criterion 4 Exams: System, concept & implementation

Evidence:

- Respective chapter in the SAR
- "Academic Assessment and Moderation Policy" [general University practice on Assessment and Moderation Policy], 27 Jan 2013 (pol-002); see: www.cdu.edu.au/governance/policies/pol-002.pdf
- Higher Education Examination Policy, 06 Feb 2013 (pol-019) [Examination process]; see: http://www.cdu.edu.au/governance/policies/pol-019.pdf
- Students Policy [framework for the delivery of quality services to the students], 13 Feb 2013 (pol-042); see: http://www.cdu.edu.au/governance/policies/pol-042.pdf
- Grading Policy [fair and transparent grading system], 06 Feb 2013 (pol-017); see: http://www.cdu.edu.au/governance/policies/pol-017.pdf
- Academic and Scientific Misconduct Policy, 27 Jan 2013 (pol-001); see: http://www.cdu.edu.au/governance/policies/pol-001.pdf
- Higher Education Students – Academic Progression Procedures [policy for monitoring student learning progress], 08 Jul 2013 (pro-038); see: http://www.cdu.edu.au/governance/procedures/pro-038.pdf
- Students - Academic Grievance Procedures, 05 Aug 2013 (pro-090); see: http://www.cdu.edu.au/governance/procedures/pro-090.pdf
- Students – Breach of Academic Integrity Procedures [breaches of academic integrity], 05 Aug 2013 (pro-092); see: http://www.cdu.edu.au/governance/procedures/pro-092.pdf

Preliminary assessment and analysis of the peers:

The concept of examination encompasses a mix of midterm examinations, final examinations and subject-specific assignments in the course of the unit. This plausibly allows for a close monitoring of the students' learning progress and encourages students' learning throughout the semester. Through helping students to consciously assess their actual state of knowledge, this assessment procedure additionally contributes to an adequate exam preparation. Students' general assent to this close monitoring system which is accompanied by a comparatively large number of exams, tests, quizzes, assignments etc. is not surprising from that point of view.

In combination with its examination system the University has established a documentation system that facilitates an early identification of those students who are in a critical progression status and thereby enables the HEI to apply an intervention strategy for students at risk at an early stage.

As to the assessment form, it can be observed that midterm exams as well as final exams are generally taken in the form of written assessments. Apart from presentations in the framework of finishing project works and, in particular, the capstone project at the end of the study course, there are hardly any oral examinations students are requested to pass in order to finish a course unit. Oral examinations as a form of simulating how to approach an engineering task in a realistic professional engineering situation under time pressure, however, are essential if the practical orientation of the degree programmes is to be considered adequate. Presentations cannot substitute for this. Therefore, it is suggested to revise the assessment strategy in the medium term with respect to an ever better alignment of the examination methods to the intended learning outcomes of the respective unit.

To ensure that students can carry out an assigned task independently and at the level of the qualification sought, both the Bachelor programmes and the Master programmes include capstone research units (10 credit point Research Project and 20 credit points Thesis respectively). These units include oral presentations to ensure that students have the skills to discuss problems in their specialist area and communicate their solutions verbally.

It could be derived from the selection of final projects and exam papers provided by the applicant HEI that they compare to the expected level of First Cycle and Second Cycle programmes, respectively.

The organization of the exams, in principle, guarantees examinations that accompany study and avoids causing extensions to the period of study. The relevant rules for examination and evaluation criteria are duly and transparently put into a legal framework, as both peers and lecturers confirm in the audit discussions. This is true for both internal students and distance learning students. The date and time of the exams are specified in the module descriptions ("unit outline") which in a commendable manner inform about the unit schedule.

Programme coordinators illustrate how students are supported in their exam preparation through the use of the on-line platform "Learnline". Invigilation of exams, re-taking of exams, counselling of students during periods of study for their exams, and supervision of the capstone projects have all been regulated in a manner that is responsive to the acquisition of the study objectives within the standard period of study time. Full-time, part-time as well as distance learning students and lecturers consent to this finding and the audit discussions leave no room for objection to this assessment.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The requirements of the above mentioned criterion have been met satisfactorily by the SEIT.

In order to further promote the inherent conjunction of intended learning outcomes and concrete assessment methods, it is recommended to re-consider the examination methods so as to more consistently reflect the intended learning outcomes of the individual units.

5. Resources

Criterion 5.1 Staff involved

Evidence:

- Analysis of needs and capacities in the respective chapter of the SAR
- staff handbook
- list of and information about research projects in the self-assessment report
- Audit discussions

Preliminary assessment and analysis of the peers:

The available information about the teaching staff leads to the impression that its competence and composition are adequate, albeit limited. Basically, there is a comparatively small number of full professorships established in the programmes under consideration. The reason for this is, according to the programme coordinators, twofold: On the one hand a rapid upward trend in student numbers in recent years has been paralleled by a continued growth of the teaching staff, which in turn needs to be balanced against objective needs at all times, technological and market developments and general financial restraints. On the other hand, the recruiting process is burdened with the remote location of CDU. Altogether, this results in an enormous relevance of industry cooperation and support, not least as a financial guarantee for operating the degree programmes. Foundation Chairs in each branch of Chemical Engineering, Civil Engineering, Electrical and Electronics Engineering, and Mechanical Engineering consequently play a significant role in the strategic planning of the further development of the School, its degree programmes and its research basis. Accordingly, the regional industry sectors of oil, gas and mining figure as leading industry branches with respect to the University's and the School's preferred cooperation partners. Because of these conditions, the University, and the SEIT in particular, depend to a considerable extent on the volatility of the regional industrial environment and job market demands as well as the acquisitive and managing skills of the SEIT's Head of School which, in turn, leads to limited planning reliability with respect to financial, physical and personal resources. The comparatively small number of teaching staff, in particular with regard to the full professors available in each programme, leads to corresponding and at times unevenly distributed workload (especially in the fields of Chemical, Civil and Electrical and Electronics Engineering). As a result of this situation, it is considered to be indispensible that teaching in the core curriculum of the programmes shall be guaranteed for the accreditation period with regard to the quantity and qualification of the teaching staff.

Deeply rooted in these restraints on finance, infrastructure and teaching staff, is the comparatively small research basis of the SEIT, at least for the time being. It is recognized that there are already promising fields of research work (for instance in the area of Computer Science) and related laboratory equipment. Efforts to implement the results of research work being done in these projects into the ongoing teaching process are appreciated as well. However, it appears advisable that the SEIT further intensifies its research activities in the core disciplinary fields along with its industry alignments.

Criterion 5.2 Staff development

Evidence:

- Acceptance of non-teaching periods for research purposes
- Capacity development offers / Further education; see respective chapter in the SAR
- Audit discussions

Preliminary assessment and analysis of the peers:

It has been observed that a range of programmes and tools are made available by the University to staff and managers for staff development. The Office of Human Resource Services focuses on staff performance, promotion and development while the Office of Learning and Teaching focuses on teaching skills. In addition, the Faculty and SEIT employ various schemes to ensure that staff members maintain their didactic and discipline relevant knowledge. On request, lecturers indicate that they engage in courses/measures aiming at promoting their didactical and disciplinary skills and competences.

With respect to the significant role of e-learning instruments and devices for distance learning students and internal students as well, it is to be noted in particular that lecturers are trained in the use of those instruments on a regular basis.

Although it has been noticed that, on average, 20-30% of the workload of the teaching staff is devoted to research activities, this reportedly describes the situation of the programme coordinators only. It is plausible that the deliberations about shortcomings concerning the teaching staff, not least at the level of the full professorship, also affect the research capabilities of the SEIT altogether.

Criterion 5.3 Institutional environment, financial and physical resources

Evidence:

1. Relevant chapter in the SAR
2. Audit discussions

Preliminary assessment and analysis of the peers:

Overall, CDU and the SEIT have convincingly demonstrated in the SAR and also during the exemplary on-site inspection of laboratories and other facilities that the physical resources employed form a sustainable basis to achieve the intended learning outcomes by the time the degree is completed. In part (as has been mentioned, for instance, with regard to the disciplinary field of Computer Science) the laboratory equipment seems to be particularly good. Furthermore, referring to the above mentioned focus on the regional job market and core industries, the build-up of the lab equipment in conjunction with the North Australian Centre for Oil and Gas is positively noteworthy. Having said this, it would be useful, at least in the long term, to refurbish the preliminary electronic measurement devices by a professional system for the Structural Load Testing Facility. In general, the infrastructural basis meets the qualitative and quantitative requirements of the degree programmes to be accredited and, thus far, is supportive of acquiring the learning outcomes at the level of the respective degree programme. Students, inter alia, highlighted the library equipment and a good access to disciplinary-related electronical media.

The financial aspects – apart from the general declaration of solidarity and support of the Rectorate of CDU – have been referred to in chapter C-5.1.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

Sub-criteria of the mentioned criterion have not been met sufficiently altogether. The additional information given by the HEI with respect to chapter 5 is taken into account but considered to be of no further relevance for the final assessment.

The issue has been raised whether the available teaching staff for the degree programmes could maintain the quality of teaching of the core curriculum in the degree programmes under review. Regarding this, it is considered necessary that the SEIT reasonably proves that teaching in the core curriculum of the programmes/specialisations is guaranteed for the accreditation period with regard to the quantity and qualification of the teaching staff. In this context and for reasons detailed above, it is also recommended that measures should be taken to generally improve the research capabilities of the SEIT.

6. Quality Management: Further Development of Degree Programmes

Criterion 6.1 Quality assurance & further development

Evidence:

- Respective Chapter in the SAR
- Course Accreditation and Reaccreditation Process (CARP) for the Bachelor of Engineering Science programmes; Stage 2 – Quality Assurance COURSE Proforma Bachelor Degree
- Course Accreditation and Reaccreditation Process (CARP) for the Master of Engineering programmes; Stage 2 – Quality Assurance COURSE Proforma Master Degree
- Student Evaluation of Learning and Teaching (SELT)
- Head of School Feedback Sessions
- Australian Graduate Survey (AGS), including Course Experience Questionnaire (CEQ) and Graduate Destination Survey (GDS)
- Audit discussions

Preliminary assessment and analysis of the peers:

CDU has established and put into practice a comprehensive quality management system which, inter alia, encompasses an internal accreditation/reaccreditation system for its degree programmes. Thereby the procedural guidelines for the internal (re-)accreditation do almost completely resemble those governing an external accreditation process. It is noteworthy that the degree programmes under consideration have passed the internal quality assurance hurdle already. Since programmes must be re-accredited when changes are made to course structures, or when a significant number of units are changed, it can reasonably be assumed that the internal quality procedure contributes substantially to constantly assessing and improving the quality of the programmes. Additionally, a rolling review process of the course units which is carried out in a two-year cycle seems to be a well-suited measure to ensure that units remain up to date with current industry practice, and that new developments are included in the curriculum as they occur. In this context, is also noted that the programmes under consideration have undergone an external accreditation through Engineers Australia.

The most important stakeholders of higher education (teaching staff, students and industry) are involved in the processes of quality assurance and further development of the degree programmes through different instruments and bodies of CDU and SEIT. An industry-driven quality assurance loop maintained through the Industry Advisory Board and discipline-specific Course Advisory Groups is considered to be exemplary. Students are engaged in the internal quality assurance measures not only through the two-year cycled SELT processes but also through feedback sessions organized at the end of each semester for all year levels of all courses, chaired by the Head of School. While on-campus students are met in class, distance learning students are given the opportunity for feedback by teleconference or e-mail.

It is highly appreciated that the students (and the distance learning students in particular) recognize the feedback they get from lecturers in the course of the unit evaluation process (SELT) as constructive and meaningful for addressing and removing shortcomings.

Taken together, the HEI is encouraged to further implement the concept of quality assurance system and to utilize the data and information gathered for the further development of the study programmes.

Criterion 6.2 Instruments, methods and data

Evidence:

- Aggregated Retention data for all Bachelor enrolments in Engineering as well as all Masters by coursework enrolments in Engineering since 2007; no statistically significant data available as yet for the degree programmes under consideration which commenced only recently
- Results of Examination; minutes of Semester 2, 2013
- Average SELT Scores 2010 – 2013
- Aggregated CEQ data of all Bachelor pass level in Engineering and Master by coursework level in Engineering in 2011 and 2012; no statistically significant data

available for the degree programmes under consideration which commenced only recently

- GDS CDU results for Bachelor graduates in 2009/2012; no statistically significant data available as yet for the degree programmes under consideration which commenced only recently

Preliminary assessment and analysis of the peers:

Both the quality assurance instruments put in place and the data gathered provide for meaningful information with a view to the achievement of learning outcomes by the time the study programme is completed, to the employment perspectives of graduates and to weaknesses of the programmes. In principle, they enable those responsible for the degree programmes to identify and through adequate measures remove shortcomings of the programmes through adequate measures.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The concept of quality assurance of the SEIT has been found adequate. The SEIT is explicitly encouraged to further implement and develop its concept.

7. Documentation & Transparency

Criterion 7.1 Relevant Regulations

Evidence:

- Main documents referred to in the respective chapter
- Northern Territory of Australia, Charles Darwin University Act governs the University, 8 March 2007, available at http://notes.nt.gov.au/dcm/legislat/legislat.nsf/d989974724db65b1482561cf0017cbd2/a5b77520f80038d0692572a30001f878/$FILE/Repc090.pdf
- Documents related to procedures, guidelines, acts, by-laws, rules, codes, *etc*. are maintained by the Governance section of the University, using the Governance Document Management Framework, available at http://www.cdu.edu.au/governance/
- Documents related to admission and to operation of the programmes, available at http://www.cdu.edu.au/governance/hestudents.html

- Charles Darwin University – Code of Conduct, Dec 2012, available at http://www.cdu.edu.au/oloc/documents/CodeofConduct.pdf
- Relevant Documents of Commonwealth, State and Territory, available at http://www.cdu.edu.au/governance/legislationregister.html

Preliminary assessment and analysis of the peers:
The main regulations of the programmes – which have been referred to in the previous chapters – encompass all key stipulations for admission, the operation of the programmes and graduation. The relevant regulations have been subject to a legal check and are in force. They are also accessible for consultation, as students explicitly confirm.

As has been mentioned in a previous chapter of this report (see chapter C-3.1), study plans for the part-time mode should be provided (additional information). Thus, it should be made transparent whether these study plans are accessible to students.

Criterion 7.2 Diploma Supplement and Certificate

Evidence:
- Sample Australian Higher Education Graduation Statement – Bachelor of Engineering
- Sample Australian Higher Education Graduation Statement – Master of Engineering

Preliminary assessment and analysis of the peers:
The Australian Higher Education Graduation Statement (AHEGS) can be judged the Australian Equivalent to the European Diploma Supplement. The AHEGS includes details of the award, the institution and a description of the current Australian Higher Education System and is distributed to all Higher Education graduates.

The samples of AHEGS at hand are not programme-specific in the sense that they contain information about the programme-specific learning outcomes ("competency profile" of graduates). Nor do they include any indication about how the final mark has been calculated (including weighting of marks), so that outsiders cannot clearly see how each component was incorporated into the final degree. Furthermore, no statistical data have been added to the final mark in order to assist the interpretation of the individual degree. This type of information would be helpful in light of the intended internationalization mentioned above, as it would allow people not familiar with the Australian grading system to interpret the value of the individual degree. The AHEGS needs to be adapted accordingly.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 7:

The requirements concerning the above mentioned criterion are not considered to be sufficiently met with respect to the AHEGS, in particular. As to that the preliminary assessment is confirmed.

Thus, programme-specific samples of the AHEGS have to be provided *for each study programme*. These must include the specified programme-specific learning outcomes. Along with that, they also need to include statistical data in addition to the final mark in order to assist those not familiar with the Australian grading system in interpreting the individual degree.

As has been said already, it is also considered necessary that the credit point system in use shall be made transparent and comprehensible to relevant external stakeholders.

D Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

D 1. Study plans for the part-time mode of each degree programme

E Comment of the Higher Education Institution (16.08.2014)

The institution provided a brief statement as well as the following additional documents :

Weblinks to study plans for the part-time mode of the degree programmes.

F Summary: Peer recommendations (02.09.2014)

Taking into account the additional information and the comments given by the CDU, the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Electrical and Electronics Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Electrical and Electronics Engineering	With requirements	EUR-ACE®	30.09.2020
Ba Mechanical Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Mechanical Engineering	With requirements	EUR-ACE®	30.09.2020
Ba Chemical Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Chemical Engineering	With requirements	EUR-ACE®	30.09.2020
Ba Civil Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Civil Engineering	With requirements	EUR-ACE®	30.09.2020

Requirements

For all degree programmes

A 1. (ASIIN 2.2) The learning objectives have to be defined for each study programme (specialisation) in the sense of indicating more precisely the skills and competences graduates should have acquired after completing the respective study programme ("qualification profile"). These *programme-specific* learning outcomes also need to be communicated and made accessible, not least in the Australian Higher Education Graduation Statement.

A 2. (ASIIN 7.2, 3.2) The credit point system in use has to be made transparent and comprehensible to relevant external stakeholders.

A 3. (ASIIN 5.1) A concept needs to be provided proving reasonably that teaching in the core curriculum of the programmes/specialisations is guaranteed for the accreditation period with regard to the quantity and qualification of the teaching staff.

A 4. (ASIIN 7.2, 2.2) Programme-specific samples of the Australian Higher Education Graduation Statement have to be provided *for each study programme*. These must include the specified programme-specific learning outcomes. Along with that, they also need to include statistical data in addition to the final mark in order to assist those not familiar with the Australian grading system in interpreting the individual degree.

For the Bachelor's degree programme in Electrical and Electronics Engineering

A 5. (ASIIN 2.2, 2.6) It must be assured that students are familiar with the foundations and possible applications of Engineering Electromagnetics.

For the Bachelor's degree programme in Mechanical Engineering

A 6. (ASIIN 2.2, 2.6) Students' ability to apply methodological competences of engineering to specific machines and equipment needs to be enlarged.

For the Bachelor's degree programme in Civil Engineering

A 7. (ASIIN 2.2, 2.6) It is necessary to extend students' civil engineering design competences.

For the Bachelor's programme in Chemical Engineering

A 8. (ASIIN 2.2, 2.6) Students' knowledge of chemical engineering fundamentals (Thermodynamics in particular) and Reactor Design as well as their ability to make use of it with regard to engineering applications need to be enlarged.

For the Master programme in Electrical and Electronics Engineering

A 9. (ASIIN 2.2, 2.6) Competences of students in the fields of Communication Architecture and Protocols as well as Energy Transmission need to be increased.

For the Master's programmes in Chemical Engineering, Mechanical Engineering and Civil Engineering

A 10. (ASIIN 2.2, 2.6) Competences in the main areas of the discipline need to be enhanced in order to ensure the achievement of the related learning outcomes at the intended depth.

Recommendations

For all degree programmes

E 1. (ASIIN 2.3, 2.6) It is recommended to revise the module descriptions ("unit outline") with regard to the learning outcomes to be achieved in the field of "Engineering practice" as well as the structure and conduct of the laboratory work in particular.

E 2. (ASIIN 4) It is recommended to reconsider the examination methods so as to more consistently reflect the intended learning outcomes of the individual units.

E 3. (ASIIN 5.1) It is recommended that measures should be taken to generally improve the research capabilities of the School of Engineering and Information Technology.

E 4. (ASIIN 3.2) It is recommended to continuously assess the actual student's workload for each educational component and to adjust the credit point allocation or the content of the module accordingly.

E 5. (ASIIN 3.1) It is recommended to support the University's internationalization strategy by promoting and assisting students in studying abroad.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering / Process Engineering (04.09.2014)

The Technical Committee discussed the procedure, and Mr. Egerer explained that in particular the qualification level of the Bachelor's programmes had been discussed among the auditors. After careful consideration the auditors concluded that a suspension of the procedure is deemed to be neither necessary nor constructive.

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee 01 – Mechanical Engineering / Process Engineering fully agrees with the final conclusion of the peers and recommends the award of the ASIIN seal with the proposed requirements and recommendations.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee Mechanical Engineering / Process Engineering.

The Technical Committee 01 – Mechanical Engineering / Process Engineering recommends the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Mechanical Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Mechanical Engineering	With requirements	EUR-ACE®	30.09.2020
Ba Chemical Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Chemical Engineering	With requirements	EUR-ACE®	30.09.2020

Technical Committee 02 – Electrical Engineering and Information Technology (10.09.2014)

The Technical Committee discusses the accreditation procedure.

Assessment and analysis for the award of the ASIIN seal:

It fully agrees to the assessment of the peers (without amendment or modification of the proposed requirements and recommendations). In particular, the Technical Committee shares the view that at all events CDU has the capacity to fulfill the requirements in due time. Therefore, it strongly suggests awarding the ASIIN seal with requirements for one year, while at the same time discouraging from suspension of the procedure (which, if considered, would affect all programmes, not only the Bachelor's programmes).

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee Electrical Engineering and Information Technology.

The Technical Committee 02 – Electrical Engineering and Information Technology recommends the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Electrical and Electronics Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Electrical and Electronics Engineering	With requirements	EUR-ACE®	30.09.2020

Technical Committee 03 – Civil Engineering, Surveying and Architecture (15.09.2014)

The Technical Committee discusses the report.

Assessment and analysis for the award of the ASIIN seal:

It follows the assessment of the peers without any changes.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific part of Subject-Specific Criteria of the Technical Committee Civil Engineering, Surveying and Architecture.

The Technical Committee 03 – Civil Engineering, Surveying and Architecture recommends the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Civil Engineering	With requirements	EUR-ACE®	30.09.2020
Ma Civil Engineering	With requirements	EUR-ACE®	30.09.2020

Technical Committee 09 – Chemistry (15.09.2014)

The Technical Committee discussed the accreditation procedure.

Assessment and analysis for the award of the ASIIN seal:

Looking at the accreditation report and the requirements formulated by the peers, the Technical Committee gained the impression that the shortcomings and weaknesses of the degree programmes in question are too grave to justify an accreditation – even with requirements. From the requirements A1 and A2 and the respective parts of the report the Technical Committee deduced that concept and structure of the degree programmes has not been sufficiently worked out and needs massive adaption and correction. From requirement A3 and the respective parts in the report, the Technical Committee gained the impression that the teaching staff in the degree programmes is not sufficient to guarantee a successful implementation of the curricula. Requirement A8 hints in the view of the Technical Committee to severe deficits of curricula contents for the Bachelor's degree programme Chemical Engineering which call into question the achievement of the intended learning outcomes of a general Chemical Engineering programme.

The Technical Committee 09 – Chemistry recommends the award of the seals as follows:

Degree Programme	ASIIN seal
Ba Chemical Engineering	Suspension
Ma Chemical Engineering	Suspension

A) Proposed Decision for <u>all degree programmes in Chemical Engineering</u> according to the Technical Committees 01 – Mechanical Engineering / Process Engineering, 02 – Electrical Engineering and Information Technology, and 03 – Civil Engineering, Surveying and Architecture: see above section F.

B) Proposed Decision for the <u>Bachelor's</u> and <u>Master's programmes in Chemical Engineering</u> according to the Technical Committee 09 – Chemistry:

Conditions to be met for resumption:

For both degree programmes

V 1. (ASIIN 2.2) The learning objectives have to be defined for each study programme (specialisation) in the sense of indicating more precisely the skills and competences graduates should have acquired after completing the respective study programme ("qualification profile"). These *programme-specific* learning outcomes also need to be communicated and made accessible, not least in the Australian Higher Education Graduation Statement.

V 2. (ASIIN 5.1) A concept needs to be provided proving reasonably that teaching in the core curriculum of the programmes/specialisations is guaranteed for the accreditation period with regard to the quantity and qualification of the teaching staff.

For the Bachelor's programme in Chemical Engineering

V 3. (ASIIN 2.2, 2.6) Students' knowledge of chemical engineering fundamentals (Thermodynamics in particular) and reactor design as well as their ability to make use of it with regard to engineering applications need to be enlarged.

For the Master's programme in Chemical Engineering

V 4. (ASIIN 2.2, 2.6) Competences in the main areas of the discipline need to be enhanced in order to ensure the achievement of the related learning outcomes at the intended depth.

Possible requirements and recommendations

Possible requirements for both degree programmes

A 1. (ASIIN 7.2, 3.2) The credit point system in use has to be made transparent and comprehensible to relevant external stakeholders.

A 2. (ASIIN 7.2, 2.2) Programme-specific samples of the Australian Higher Education Graduation Statement have to be provided *for each study programme*. These must include the specified programme-specific learning outcomes. Along with that, they also need to include statistical data in addition to the final mark in order to assist those not familiar with the Australian grading system in interpreting the individual degree.

Possible recommendations for both degree programmes

E 1. (ASIIN 2.3, 2.6) It is recommended to revise the module descriptions ("unit outline") with regard to the learning outcomes to be achieved in the field of "Engineering practice" as well as the structure and conduct of the laboratory work in particular.

E 2. (ASIIN 4) It is recommended to reconsider the examination methods so as to more consistently reflect the intended learning outcomes of the individual units.

E 3. (ASIIN 5.1) It is recommended that measures should be taken to generally improve the research capabilities of the School of Engineering and Information Technology.

E 4. (ASIIN 3.2) It is recommended to continuously assess the actual student's workload for each educational component and to adjust the credit point allocation or the content of the module accordingly.

E 5. (ASIIN 3.1) It is recommended to support the University's internationalization strategy by promoting and assisting students in studying abroad.

H Decision of the Accreditation Commission (26.09.2014)

The Accreditation Commission for Degree Programmes discusses the procedure. It notices that hitherto the university doesn't award credits for the mandatory 12 weeks work experience students are expected to complete within their respective curriculum. However, referring to the ECTS Users' Guide (http://ec.europa.eu/education/tools/docs/ects-guide_en.pdf, p. 19), it considers an allocation of ECTS credit points indispensible, if work placements or internships are required to complete the respective programme, since in that case "they are part of students' learning outcomes and workload." From the point of view of the Accreditation Commission this needs to be taken into account particularly when converting the Australian credit point system and related information on student workload into the ECTS credit point system. This is to say that, while converting the students' workload into ECTS credit points, the university has to comprehensibly award a certain amount of ECTS credit points for the workload students are expected to bear during their work placement. These credits may be added to the total sum of ECTS credit points awarded without necessarily changing the Australian credit point allocation, including the 0 credit point assignment for the work placement units. Australia isn't a member of the Bologna Process and therefore is not supposed to be bound by the fixed ECTS ranges per semester / study year according to the Users' Guide. However, regardless of the credit point distribution in either credit point system, students need to be adequately informed about the additional workload incurring through the mandatory placement. Considering both aspects, the Accreditation Commission decides to reformulate requirement 2 accordingly. For clarification purposes it also concludes some minor editorial amendments concerning recommendation 4 (deletion of "continually") and 5 ("to promote the student exchange" instead of "to support the University's internationalization strategy by promoting and assisting students in studying abroad").

In line with the Technical Committees responsible for Engineering Degree programmes, the Accreditation Commission confirms the expectation that the University will be capable to remove the deficits identified by the peers and the Technical Committees, even in a relatively brief time span. Assuming that a suspension of the procedure might more likely hurt than promote the progression and development of the degree programmes, it thus decides not to follow the proposed resolution of the Technical Committee 09 – Chemistry.

Assessment and analysis for the award of the subject-specific ASIIN seal:

Apart from the modifications mentioned above, the Accreditation Commission agrees to the assessment and proposed resolution of the peers and the Technical Committees responsible for Engineering Degree programmes.

Assessment and analysis for *the award of the EUR-ACE® Label:*

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committees Mechanical Engineering, Electrical Engineering and Information Technology and Civil Engineering, respectively.

The Accreditation Commission for Degree Programmes decides to award the following seals:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Electrical and Electronics Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Electrical and Electronics Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Mechanical Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Mechanical Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Chemical Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Chemical Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020

Requirements

For all degree programmes

A 1. (ASIIN 2.2) The learning objectives have to be defined for each study programme (specialisation) in the sense of indicating more precisely the skills and competences graduates should have acquired after completing the respective study programme ("qualification profile"). These *programme-specific* learning outcomes also need to be communicated and made accessible, not least in the Australian Higher Education Graduation Statement.

A 2. (ASIIN 3.2, 2.4) The credit point system in use has to be made transparent and comprehensible to relevant external stakeholders. Students must be aware of the additional workload for the practical placement. When expressing the workload in ECTS, it must be ensured that all mandatory elements are credited.

A 3. (ASIIN 5.1) A concept needs to be provided proving reasonably that teaching in the core curriculum of the programmes/specialisations is guaranteed for the accreditation period with regard to the quantity and qualification of the teaching staff.

A 4. (ASIIN 7.2, 2.2) Programme-specific samples of the Australian Higher Education Graduation Statement have to be provided *for each study programme*. These must include the specified programme-specific learning outcomes. Along with that, they also need to include statistical data in addition to the final mark in order to assist those not familiar with the Australian grading system in interpreting the individual degree.

For the Bachelor's degree programme in Electrical and Electronics Engineering

A 5. (ASIIN 2.2, 2.6) It must be assured that students are familiar with the foundations and possible applications of Engineering Electromagnetics.

For the Bachelor's degree programme in Mechanical Engineering

A 6. (ASIIN 2.2, 2.6) Students' ability to apply methodological competences of engineering to specific machines and equipment needs to be enlarged.

For the Bachelor's degree programme in Civil Engineering

A 7. (ASIIN 2.2, 2.6) It is necessary to extend students' civil engineering design competences.

For the Bachelor's programme in Chemical Engineering

A 8. (ASIIN 2.2, 2.6) Students' knowledge of chemical engineering fundamentals (Thermodynamics in particular) and reactor design as well as their ability to make use of it with regard to engineering applications need to be enlarged.

For the Master programme in Electrical and Electronics Engineering

A 9. (ASIIN 2.2, 2.6) Competences of students in the fields of communication architecture and protocols as well as energy transmission need to be increased.

For the Master's programmes in Chemical Engineering, Mechanical Engineering and Civil Engineering

A 10. (ASIIN 2.2, 2.6) Competences in the main areas of the discipline need to be enhanced in order to ensure the achievement of the related learning outcomes at the intended depth.

Recommendations

For all degree programmes

E 1. (ASIIN 2.3, 2.6) It is recommended to revise the module descriptions ("unit outline") with regard to the learning outcomes to be achieved in the field of "Engineering practice" as well as the structure and conduct of the laboratory work in particular.

E 2. (ASIIN 4) It is recommended to reconsider the examination methods so as to more consistently reflect the intended learning outcomes of the individual units.

E 3. (ASIIN 5.1) It is recommended that measures should be taken to generally improve the research capabilities of the School of Engineering and Information Technology.

E 4. (ASIIN 3.2) It is recommended to assess the actual student's workload for each educational component and to adjust the credit point allocation or the content of the module accordingly.

E 5. (ASIIN 3.1) It is recommended to promote the student exchange.