ASIIN Accreditation Report

Bachelor's Degree Programme
Electric Power Engineering
Master's Degree Programmes
Electric Power Engineering (profile direction + pedagogical direction)

provided by
Karaganda State Technical University

Version: 28 March 2014

Table of Content

A About the Accreditation Process

Title of the degree programme	Labels applied for	Previous accreditation	Involved Technical Committees (TC)[1]
Bachelor Power Engineering	ASIIN, EUR-ACE® Label	n/a	02
Master Power Engineering (profile direction)	ASIIN, EUR-ACE® Label	n/a	02
Master Power Engineering (pedagogical direction)	ASIIN	n/a	02

Date of the contract: 05 November 2012

Submission of the final version of the self-assessment report: 20 June 2013

Date of the onsite visit: 07-09 January 2014

at: Karaganda State University, main campus Karaganda

Peer panel:

Prof. Dr.-Ing. Ralph Kennel, Technical University Munich;

Axel Raue, cegelec[2];

Marat Sagudtinov, German-Kazakh University in Almaty, student;

Prof. Dr.-Ing. Reiner Schütt, West Coast University of Applied Sciences;

Prof. Dr. Harald Schwarz, Brandenburg Technical University Cottbus[3]

[1] 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 04 – Informatics/Computer Science); TC 05 – Physical Technologies, Materials and Processes); TC 06 – Industrial Engineering; TC 07 – Business Informatics/Information Systems; TC 08 – Agronomy, Nutritional Sciences and Landscape Architecture; TC 09 – Chemistry; TC 10 – Life Sciences; TC 11 – Geosciences; TC 12 – Mathematics; TC 13 – Physics.

[2] Did not participate in the onsite visit due to illness

[3] Did not participate in the onsite visit due to illness

Representative of the ASIIN headquarter: Jana Möhren, Mila Zarkh
Responsible decision-making committee: Accreditation Commission for Degree Programmes
Criteria used: European Standards and Guidelines, version 10.05.2005 ASIIN General Criteria, version 28.06.2012 Subject-Specific Criteria of Technical Committee 02 – Electrical Engineering and Information Technology, version 09.12.2011

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) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Electric Power Engineering / Bachelor of Engineering and Technology	Electric supply of general industrial enterprises, electric supply of mining enterprises	Full time	8 semesters 165 Kaz. CP 275 ECTS	September 1, 2004 Every winter semester	Approx. 60 / year	346600 tenge / year (approx. 1600 €)
Electric Power Engineering / Master of Science (profile direction)		Full time	3 semesters 40 Kaz. CP 100 ECTS	September 1, 2001 Every winter semester	Approx. 10-15/ year (for both directions)	421000 tenge / year (approx. 1900€)
Electric Power Engineering / Master of Science (pedagogical direction)		Full time	4 semesters 51 Kaz. CP 161 ECTS	September 1, 2001 Every winter semester	Approx. 10-15/ year (for both directions)	421000 tenge / year (approx. 1900€)

For the Bachelor's degree programme, the self-assessment report states the following **intended learning outcomes**:

- "An ability of using natural-scientific, mathematical and engineering knowledge;
- An ability of planning and carrying out an experiment, fixing and interpreting data;
- An ability of designing processes or systems in accordance with the defend problems;
- An ability of working in a team on interdisciplinary subjects;
- An ability of formulating and solving engineering problems;
- Understand of professional and ethical duties;
- An ability of efficient interacting in a team;
- Wide erudition needed for understanding global and social consequences of engineering decisions;
- Understanding of the necessity to study continuously;
- Knowing and understanding of modern social, political and scientific-technical problems;
- An ability of using skills and studied methods in engineering practice."

According to the self-assessment report, the Bachelor's degree programme shall enable students to acquire the following **intended learning outcomes**:

“to understand:

- moral values and their relevance;
- the consequences of his professional activity;
- organizational bases of measures for liquidating accidents, catastrophes, disasters consequences, and other emergency situations;

To know:

- bases of the legal system and legislation of the Republic of Kazakhstan; the legal moral-ethical norms in the sphere of professional activity;
- present day and prospective trends of developing electric power engineering of computer technologies, up-to-date software;
- principles of operation, technical characteristics and structural features of the developed and used means of electric power engineering;
- methods of carrying out theoretical and experimental studies in the field of electric power engineering;
- bases of designing, constructing, mounting and operating electric power sets;
- the requirements of standardization, metrological provision and vital functions safety when developing and using electric power equipment;
- the main methods of marketing and management in the field of electric power engineering;
- rules and norms of designing, constructing, mounting and using electric power sets and systems;
- theoretical and experimental methods of studying for the purpose of developing new prospective trends in the field of electric power engineering;
- necessary measures for ensuring vital functions safety and environment protection in producing, constructing and using electric power sets and systems;

To be able:

- to develop principles of organization, designing enterprises and devices of electric power engineering;
- to use applied programs packages for calculating, modeling and automation of designing electric power engineering systems;

To possess skills:

- of using the studied technical objects;
- of formulating the main technical-economic requirements to the designed devices and systems;
- of developing and designing on the modern elemental base electric power engineering systems and devices;
- of working in electronic and computer networks and systems;

To be competent:

- in the field of operation depending on the studied elective disciplines:
- electric stations and substations;
- electric systems and networks;
- relay protection and automation of electric engineering systems;
- electric power supply for enterprises of different industries;
- electrification and automation of agricultural production;
- non-traditional and renewable energy sources;
- electric mechanics;
- electric insulation and cable equipment;
- electric technological sets and systems;
- lighting technology and light sources;
- electric transport;
- electric equipment for transport means;
- electric drive and automation of technological complexes."

The intended learning outcomes as described above are not published or stipulated in any form.

The following curriculum is presented for the specialization "General Industrial Enterprises".

№	MODULE CODE	DISCIPLINE CODE	THE NAME OF THE MODULE AND THE DISCIPLINES THAT CONSTITUTE A MODULE	Distribution by semester						HOURS							Distribution of the credits per semester							
											of them													
				exams	the course projects	the course works	test tasks, cgw, cw	quantity of the credits of ECTS	quantity of the credits	total amount of hours	classroom hours	lectures	practical/ seminars	laboratory works	IWS	IWST	1 term	2 term	3 term	4 term	5 term	6 term	7 term	8 term
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CD - Comprehensive disciplines - 33 (1485)																								
	MC 1.1		***Mandatory component - 33(1485)***																					
1	**HK 01**	HK 1101	**Module** History of Kazakhstan	2				5	3	135	45	15	30		45	45		3						
2	**Inf 02**	Inf 1102	**Module** Informatics	1				5	3	135	45	15		30	45	45	3							
3	**PLS 03**	PLS 1103	**Module** Principles of life safety	1				3	2	90	30	15	15		30	30	2							
4	**Soc 04**	Soc 2104	**Module** Sociology	3				3	2	90	30	15	15		30	30			2					
5	**ESD 05**	ESD 1105	**Module** Environment and sustainable development	1				3	2	90	30	15	15		30	30	2							
6	**K(R)L 06**	K(R)L 1106	**Module** Kazakh (Russian) language	2			1	9	6	270	90		90		90	90	3	3						
7	**FET 07**	FET 2107	**Module** Foundations of economic theory	3				3	2	90	30	15	15		30	30			2					
8	**FL 08**	FL1108	**Module** Foreign language	2			1	9	6	270	90		90		90	90	3	3						
9	**LB 09**	LB 3109	**Module** Low bases	5				3	2	90	30	15	15		30	30					2			
10	**PS 10**	PS 2110	**Module** Political science	4				3	2	90	30	15	15		30	30				2				
11	**Phi 11**	Phi 2111	**Module** Philosophy	3				5	3	135	45	15	30		45	45			3					
			Total of CD:					**51**	**33**	**1485**	**495**	**135**	**330**	**30**	**495**	**495**								
BD - Basic disciplines - 64 (2880)																								
	MC 2.1		***Mandatory component - 20(900)***																					
1	**PK(R)L 12**	PK (R)L3201	**Module** Professional Kazakh (Russian) language	6				3	2	90	30		30		30	30						2		
2	**P-oFL 13**	P-oFL 3202	**Module** Professionally-oriented foreign language	6				3	2	90	30		30		30	30						2		
3	**Mat(I) 14**	Mat(I) 1203	**Module** Mathematics I	1				5	3	135	45	15	15	15	45	45	3							
4	**Mat(II) 15**	Mat(II) 1204	**Module** Mathematics 2	2				5	3	135	45	15	15	15	45	45		3						
5	**Phy 16**	Phy 1205	**Module** Physics	2				6	4	180	60	30	15	15	60	60		4						

B Characteristics of the Degree Programmes

6	**TBEE (I) 17**	TBEE (I) 2206	**Module** Theoretical bases of electrical engineerings I	3				5	3	135	45	15	15	15	45	45			3					
7	**TBEE (II) 18**	TBEE (II) 2207	**Module** Theoretical bases of electrical engineerings II	4				5	3	135	45	15	15	15	45	45				3				
	SC 2.2		***Selection component - 44 (1980)***																					
8	**SM 19**	SM 1208	**Module** Software modeling	2				5	3	135	45	15	15	15	45	45		3						
	EP 20		**Module** Electrotechnical production																					
9		TEP 2209	Technology of electrotechnical production				3	5	3	135	45	30		15	45	45			3					
10		OI2210	Overstrain and isolation	4				5	3	135	45	30		15	45	45				3				
11	**Mec 21**	Mec 2211	**Module** Mechanics	4				5	3	135	45	30	15		45	45				3				
12	**LP 22**	LP 4212	**Module** Labor protection	7				5	3	135	45	30		15	45	45							3	
13	**MTCMPE 23**	MTCMPE 2213	**Module** Mathematical tasks and computer modeling in power engeneering	4				3	2	90	30	15		15	30	30				2				
	IOPEF 24		**Module** Installation and operation of power engineering facilities																					
14		EI 3314	Electric lighting				5	5	3	135	45	15	15	15	45	45					3			
15		IEEE 3315	Installation and exploitation of electrical equipment	6				5	3	135	45	15	15	15	45	45						3		
	EEPS 25		**Module** Electrical equipment plants and substations																					
16		ESN 3316	Electrical systems and networks				6	5	3	135	45	15	15	15	45	45						3		
17		DPS 3217	Power plants and substations	6				5	3	135	45	15	15	15	45	45						3		
	PE 26		**Module** Power engeneering																					
18		PE 3218	Power engeneering				5	5	3	135	45	30		15	45	45					3			
19		EMS 3219	Electrotechnical material science	5				5	3	135	45	15	15	15	45	45					3			
20	**EEE 27**	EEE 4220	**Module** Electromechanics and electrical equipment	7				6	4	180	60	30	15	15	60	60						4		
21	**HS 28**	HS 4221	**Module** Heat supply	7				5	3	135	45	15	15	15	45	45						3		
22	**ES 29**	ES 4222	**Module** Economics of sphere	7				3	2	90	30	15	15		30	30						2		
			Total of BD:					**104**	**64**	**2880**	**960**	**405**	**285**	**270**	**960**	**960**								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PBS - Profile branches of sciences - 32 (1440)																								
		MC 3.1	***Mandatory component- 5(225)***																					
1	**EM 30**	EM 3301	**Module** Electrical machines	5				5	3	135	45	15	15	15	45	45					3			
2	**IE 31**	IE 2302	**Module** Industrial electronics	3				3	2	90	30	15		15	30	30			2					
	KB 3.2		***Selection component - 27(765)***																					
	CD 32		**Module** Circuit design																					
3		DT 2303	Digital technique		3			5	3	135	45	15	15	15	45	45			3					
4		IME 2304	Information and measuring equipment	4				5	3	135	45	30		15	45	45				3				
	TE 33		**Module** Transients (modes) in electroinstallations																					
5		EI 3214	Electrical installation				5	5	3	135	45	30		15	45	45					3			
6		TPE 3215	Transients in power engeneering	6				5	3	135	45	15	15	15	45	45						3		
7	**EICIE 34**	EICIE 4307	**Module** Electromechanical installations of the common industrial enterprises	7				5	3	135	45	30	15		45	45							3	
	PEPD 35		**Module** Power engineering power device																					
8		DMCTL 3308	Design and mechanical calculation of transmission lines		5			5	3	135	45	30		15	45	45					3			
9		PCD 3309	Power converting devices	6	6			5	3	135	45	15	15	15	45	45						3		
	DPSC 36		**Module** Designing of power supply companies																					
10		RPAPSS 4310	Relay protection and automation in power supply systems			8		5	3	135	45	15	15	15	45	45								3
11		DPSC 4313	Designing of power supply companies	8	8			5	3	135	45	15	15	15	45	45								3
			Total of PBS:					**53**	**32**	**1440**	**480**	**225**	**105**	**150**	**480**	**480**								
TOTAL credits (hours) of theoretical education								**208**	**129**	**5805**	**###**	**765**	**720**	**450**	**1935**	**1935**	**16**	**19**	**18**	**16**	**20**	**19**	**15**	**6**
										The number of course projects									1		1	1		1
										The number of course works														1
										The number of test tasks, cgw, cw, abstracts							2		1		3	1		
										The number of exams							4	6	5	6	3	6	5	1
ATE - Additional types of education - 24(1020)																								
	MC 4.1		**Mandatory component - 14(570)**																					
1	**PC 37**	PC2401	**Module** Physical culture	2,4				12	8	240							4	4	4	4				
2	**TP 38**	TP 1402	**Module** Teaching practice	2				4	6	90								6						
3	**IP 39**	IP 2403	**Module** Industrial practice	4,6				16	6	450										3		3		
4	**PPP 40**	PPP 3404	**Module** Pre-diploma practice	8				8	3	225														3
	K.B. 4.2		***Selection component - 10 (450)***																					
5	**MT 41**	MT 2405	**Module** Military training					15	10	450														
	Total of ATE:							**55**	**33**	**1455**														
FC - Final certification - 3 (315)																								

1	**SES) 42**	SES 4502	**Module** State examination in the specialty	8				8	2	210															2
2	**WDDW 43**	WDDW 4501	**Module** Writing and defending the diploma work (project)	8				4	1	105															1
			Total of CA:					**12**	**3**	**315**															
Total of CA:								**275**	**165**	**7575**															

The following curriculum is presented for the specialization mining enterprises

№	MODULE CODE	DISCIPLINE CODE	THE NAME OF THE MODULE AND THE DISCIPLINES THAT CONSTITUTE A MODULE	Distribution by semester						HOURS							Distribution of the credits per semester							
											of them														
				exams	the course projects	the course works	test tasks, cgw, cw	quantity of the credits of ECTS	quantity of the credits	total amount of hours	classroom hours	lectures	practical/ seminars	laboratory works	IWS	IWST	1 term	2 term	3 term	4 term	5 term	6 term	7 term	8 term
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
CD - Comprehensive disciplines - 33 (1485)																								
	MC 1.1		***Mandatory component - 33(1485)***																					
1	**HK 01**	HK 1101	**Module** History of Kazakhstan	2				5	3	135	45	15	30		45	45		3						
2	**Inf 02**	Inf 1102	**Module** Informatics	1				5	3	135	45	15		30	45	45	3							
3	**PLS 03**	PLS 1103	**Module** Principles of life safety	1				3	2	90	30	15	15		30	30	2							
4	**Soc 04**	Soc 2104	**Module** Sociology	3				3	2	90	30	15	15		30	30			2					
5	**ESD 05**	ESD 1105	**Module** Environment and sustainable development	1				3	2	90	30	15	15		30	30	2							
6	**K(R)L 06**	K(R)L 1106	**Module** Kazakh (Russian) language	2			1	9	6	270	90		90		90	90	3	3						
7	**FET 07**	FET 2107	**Module** Foundations of economic theory	3				3	2	90	30	15	15		30	30			2					
8	**FL 08**	FL1108	**Module** Foreign language	2			1	9	6	270	90		90		90	90	3	3						
9	**LB 09**	LB 3109	**Module** Low bases	5				3	2	90	30	15	15		30	30					2			
10	**PS 10**	PS 2110	**Module** Political science	4				3	2	90	30	15	15		30	30				2				
11	**Phi 11**	Phi 2111	**Module** Philosophy	3				5	3	135	45	15	30		45	45			3					
			Total of CD:					**51**	**33**	**1485**	**495**	**135**	**330**	**30**	**495**	**495**								
BD - Basic disciplines - 64 (2880)																								
	MC 2.1		***Mandatory component - 20(900)***																					
1	**PK(R)L 12**	PK (R)L3201	**Module** Professional Kazakh (Russian) language	6				3	2	90	30		30		30	30						2		
2	**P-oFL 13**	P-oFL 3202	**Module** Professionally-oriented foreign language	6				3	2	90	30		30		30	30						2		
3	**Mat(I) 14**	Mat(I) 1203	**Module** Mathematics I	1				5	3	135	45	15	15	15	45	45	3							
4	**Mat(II) 15**	Mat(II) 1204	**Module** Mathematics 2	2				5	3	135	45	15	15	15	45	45		3						
5	**Phy 16**	Phy 1205	**Module** Physics	2				6	4	180	60	30	15	15	60	60		4						
6	**TBEE (I) 17**	TBEE (I) 2206	**Module** Theoretical bases of electrical engineerings I	3				5	3	135	45	15	15	15	45	45			3					
7	**TBEE (II) 18**	TBEE (II) 2207	**Module** Theoretical bases of electrical engineerings II	4				5	3	135	45	15	15	15	45	45				3				
	KB 2.2		***Selection component - 44 (1980)***																					
8	**SM 19**	SM 1208	**Module** Software modeling	2				5	3	135	45	15	15	15	45	45		3						
	MD 20		**Module** Mining deal																					
9		TMD 2209	Technology of mining deal				3	5	3	135	45	30		15	45	45			3					
10		BW 2210	Blasting works	4				5	3	135	45	30		15	45	45				3				
11	**Mec 21**	Mec 2211	**Module** Mechanics	4				5	3	135	45	30	15		45	45				3				
12	**LP 22**	LP 4212	**Module** Labor protection	7				5	3	135	45	30		15	45	45							3	
13	**MTCMPE 23**	MTCMPE 2213	**Module** Mathematical tasks and computer modeling in power engeneering	4				3	2	90	30	15		15	30	30				2				
	IOPEF 24		**Module** Installation and operation of power engineering facilities																					
14		EI 3314	Electric lighting				5	5	3	135	45	15	15	15	45	45					3			
15		IEEE 3315	Installation and exploitation of electrical equipment	6				5	3	135	45	15	15	15	45	45						3		
	EIME 25		**Module** Electromechanical installations of the mountain enterprises																					
16		PEPD 3316	Power engineering power device				6	5	3	135	45	15	15	15	45	45						3		
17		DMCTL 3217	Design and mechanical calculation of transmission lines	6				5	3	135	45	15	15	15	45	45						3		
	PCD 26		**Module** Power converting devices																					
18		DPSC 3218	Designing of power supply companies				5	5	3	135	45	30		15	45	45					3			

B Characteristics of the Degree Programmes

19		RPAPSS3219	Relay protection and automation in power supply systems	5				5	3	135	45	15	15	15	45	45					3			
20	DPSC 27	DPSC 4220	**Module** Designing of power supply companies	7				6	4	180	60	30	15	15	60	60							4	
21	HS 28	HS 4221	**Module** Heat supply	7				5	3	135	45	15	15	15	45	45							3	
22	ES 29	ES 4222	**Module** Economics of sphere	7				3	2	90	30	15	15		30	30							2	
			Total of BD:					**104**	**64**	**2880**	**960**	**405**	**285**	**270**	**960**	**960**								
1	2	3	**4**	5	6	7	8	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	18	19	20	21	22	23	24	25
PBS - Profile branches of sciences - 32 (1440)																								
		MC 3.1	***Mandatory component- 5(225)***																					
1	EM 30	EM 3301	**Module** Electrical machines	5				5	3	135	45	15	15	15	45	45					3			
2	IE 31	IE 2302	**Module** Industrial electronics	3				3	2	90	30	15		15	30	30			2					
	KB 3.2		***Selection component - 27(765)***																					
	CD 32		**Module** Circuit design																					
3		DT 2303	Digital technique		3			5	3	135	45	15	15	15	45	45			3					
4		IME 2304	Information and measuring equipment	4				5	3	135	45	30		15	45	45				3				
	TE 33		**Module** Transients (modes) in electroinstallations																					
5		EI 3214	Electrical installation				5	5	3	135	45	30		15	45	45					3			
6		TPE 3215	Transients in power engeneering	6				5	3	135	45	15	15	15	45	45						3		
7	EIME 34	EIME 4307	**Module** Electromechanical installations of the mountain enterprises	7				5	3	135	45	30	15		45	45							3	
	PEPD 35		**Module** Power engineering power device																					
8		DMCTL 3308	Design and mechanical calculation of transmission lines		5			5	3	135	45	30		15	45	45					3			
9		PCD 3309	Power converting devices	6	6			5	3	135	45	15	15	15	45	45						3		
	DPSC 36		**Module** Designing of power supply companies																					
10		RPAPSS 4310	Relay protection and automation in power supply systems			8		5	3	135	45	15	15	15	45	45								3
11		DPSC 4313	Designing of power supply companies	8	8			5	3	135	45	15	15	15	45	45								3
			Total of PBS:					**53**	**32**	**1440**	**480**	**225**	**105**	**150**	**480**	**480**								
TOTAL credits (hours) of theoretical education								**208**	**129**	**5805**	**1935**	**765**	**720**	**450**	**1935**	**1935**	**16**	**19**	**18**	**16**	**20**	**19**	**15**	**6**
										The number of course projects									1		1	1		1
										The number of course works														1
										The number of test tasks, cgw, cw, abstracts							2		1		3	1		
										The number of exams							4	6	5	6	3	6	5	1
ATE - Additional types of education - 24(1020)																								
	MC 4.1		Mandatory component - 14(570)																					
1	PC 37	PC2401	**Module** Physical culture	2,4				12	8	240							4	4	4	4				
2	TP 38	TP 1402	**Module** Teaching practice	2				4	6	90								6						
3	IP 39	IP 2403	**Module** Industrial practice	4,6				16	6	450										3		3		
4	PPP 40	PPP 3404	**Module** Pre-diploma practice	8				8	3	225														3
	K.B. 4.2		***Selection component - 10 (450)***																					
5	MT 41	MT 2405	**Module** Military training					15	10	450														
			Total of ATE:					**55**	**33**	**1455**														
FC - Final certification - 3 (315)																								
1	SES) 42	SES 4502	**Module** State examination in the specialty	8				8	2	210														2
2	WDDW 43	WDDW 4501	**Module** Writing and defending the diploma work (project)	8				4	1	105														1
			Total of CA:					**12**	**3**	**315**														
Total of CA:								**275**	**165**	**7575**														

With regard to the Master's degree programme, the university states the following **intended learning outcomes** in the self-assessment report:

To understand:
- the principle of the feedback as of the general and objective law of management;
- the importance of accounting when defining and solving professional problems of the complex of technical, ecological and social factors;
- the home standards relating to the performed work within the frames of specialty;
- methods and technologies of using renewable energy sources and decentralized power supply;

To know:
- the legislative and normative base of the Republic of Kazakhstan power engineering;
- principles of work, technical characteristics of the used home and foreign electric equipment in the field of electric power engineering;
- methods of carrying out tests and calculations used within the frames of specialty;
- problems of psychology solved in the labor team;
- bases of management;
- economic regulations, realized in Kazakhstan power engineering;

To be able:
- to carry out expertise of technical documentation;
- to develop and realize measures for energy saving and efficient use of power;
- to use, adjust and service up-to-date equipment of industrial enterprises and power systems;
- to develop and implement measures for environmental protection;

To possess skills:
- of formulating and solving concrete practical problems;
- of working with up-to-date computers and applied software;
- of knowing professional terminology of a foreign language;
- of organizing and carrying out experimental studies related to developing projects and programs,
- of carrying out work to standardize technical aids, systems, processes, equipment and materials, making necessary reviews, opinions, decisions;
- of organizing the team for developing creative initiative, rationalization, inventions, implementing the achievements of home and foreign science, technology, using advanced experience that ensures the efficient work of an enterprise, division;

To be competent:
- in using mathematical apparatus for solving the studied problems;

- in the professional activity at any stage of the technological process of producing, distributing and consuming electric power."

Additionally, the self-report notes that Master's degree graduates should be able:

"to know:

- the latest discoveries in the field of electric power engineering and prospects and volumes of their use;
- the principle of the feedback as of the general and objective law of management;
- the importance of accounting when defining and solving professional problems of the complex of technical, ecological and social factors;
- the home and foreign standards relating to the performed work within the frames of specialty;
- the anthropogenic load on the environment from the objects of power engineering and measures for its reducing;
- methods of carrying out studies and calculations used within the frames of specialty;
- methods of evaluation of electric power supply system's reliability;
- psychological problems solved at higher school;
- bases of higher school pedagogy;
- bases of management;

To be able:

- to perform technical documentation expertise;
- to develop and realize measures for electric power efficient use in industry, energy saving, use of renewable energy sources and environmental protection;
- to carry out bibliographic work attracting present day information technologies;
- to present the results of his work in the form of reports, summaries, articles formatted in accordance with the requirements, attracting up-to-date means of editing and printing;

To possess skills:

- of independent carrying out scientific search, formulating the object of studies and solving concrete scientific problems;
- of using criteria of optimizing electric power engineering systems, schemes and their protection forms;
- of processing the obtained results, making conclusions;
- of working with up-to-date computers and applied software;
- of possessing professional terminology of a foreign language;

To be competent:

- in using mathematical apparatus for solving the studied problems;

- in using computers and software when carrying out research and processing materials.”

The intended learning outcomes as described above are not published or stipulated in any form.

The following curricula are presented:

For the profile direction

No	MODULE CODE	DISCIPLINE CODE	NAME OF MODULE AND DISCIPLINES FORMING THE MODULE	Distribution in terms						HOURS							Credits distribution in terms			
											Of them									
				examinations	Term projects	Term works	Testing tasks, summaries	ECTS credits number	Credits number	Total volume of hours	Class hours	lectures	Pract/seminar classes	Laboratory works	SIW	SIWT	1 term	2 term	3 term	4 term
1	2	3	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
BD - Basic disciplines - 10 (600)																				
	CC 2.1		***Compulsory component - 5 (300)***																	
1	**IYa 1**	IYa 5201	ModuleForeign language (professional)	1				4	2	120	30		30		60	30	2			
2	**Psi 2**	Psi 5202	ModulePsychology	1				4	2	120	30	30			60	30	2			
3	**Men 3**	Men 5203	ModuleManagement	2				2	1	60	15	15			30	15		1		
	EC 2.2		***Elective component - 5 (300)***																	
4	**DKYa 4**	DKYa 5201	ModuleBusiness Kazakh	2				4	2	120	30		30		60	30		2		
5	**OEK 5**	OEK 5202	Module Equipment of EPE complexes	1				6	3	180	45	45			90	45	3			
			Total ofBD:					**20**	**10**	**600**	**150**	**90**	**60**		**300**	**150**				
PD - Profile disciplines - 18 (1080)																				
	CC 3.1		***Compulsory component - 6 (360)***																	

1	**TOTE 6**	TPTEE 5301	Module Theory and practice of technical experiment in EPE	1				8	4	240	60	60			120	60	4			
2	**SPE 7**	SPE 5302	ModuleModernproblemsofEPE	1				4	2	120	30	30			60	30	2			
		EC 3.2	***Elective component - 12 (720)***																	
4	**STE 8**	STE 6301	Module Network technologies in EPE	2				6	3	180	45	30		15	90	45		3		
5	**EiE 9**	EiE 6302	ModulePower saving and energy audit	3				4	3	180	45	30		15	90	45			3	
	NVIE 10		Module Nontraditional and renewable sources of energy																	
7		NVIE 5303	Electric stations and substations				2	6	3	180	45	30		15	90	45		3		
8		PEUVE 6304	Designandoperationof renewable energy sets	3				6	3	180	45	30		15	90	45			3	
			Total ofPD:					**26**	**14**	**840**	**210**	**150**		**60**	**420**	**210**				
TOTAL credits (hours) of theoretical training								**56**	**28**	**1680**	**420**	**300**	**60**	**60**	**840**	**420**	**13**	**9**	**6**	
										Number of term projects										
										Number of term works										
										Number of test tasks, prp, pp, summaries, отчетов								1		
										Number of examinations							5	3	2	
P - Practice - 4 (300)																				
1	**PP 14**	PP 5401	ModuleIndustrial practice				2	12	4	300	60					240		4		
			Total of P:					**12**	**4**	**300**	**60**					**240**				
MSERW –Masterstudent'sexperimental-researchwork - 4 (480)																				
1	**EIRM 15**	EIRM 6501	Module Master student's experimental-research work including making master's dissertation				1,2,3	16	4	480	60				210	210	1	1	2	
			Total of MSERW:					**16**	**4**	**480**	**60**				**210**	**210**				

FA –Final attestation - 4 (420)																					
1	**OSMD 16**	OSMD 6601	Module Formatting and defending master's dissertation	3				12	3	315	45				135	135			3	
2	**KE 17**	KE 6602	ModuleComplex examination	3				4	1	105	15				45	45			1	
			Total of FA:					**16**	**4**	**420**	**60**				**180**	**180**				
ВСЕГОкредитов:								**100**	**40**	**2880**	**600**				**1230**	**1050**	**14**	**14**	**12**	

For the pedagogical direction:

No	MODULE CODE	DISCIPLINE CODE	NAME OF MODULE AND DISCIPLINES FORMING THE MODULE	Distribution in terms						HOURS										Credits distribution in terms
										Total volume of hours	Of them									
				examinations	Term projects	Term works	Testing tasks, summaries	ECTS credits number	Credits number		Class hours	lectures	Pract/seminar classes	Laboratory works	SIW	SIWT	1 term	2 term	3 term	4 term
1	2	3	3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
BD - Basic disciplines - 16 (1200)																				
	CC 2.1		***Compulsory component - 8 (600)***																	
1	IFN 1	IFN 5201	ModuleHistory and philosophy of science	1				6	2	150	30	30			60	60	2			

2	IYa 2	IYa 5202		ModuleForeign language (professional)	1				6	2	150	30		30		60	60	2			
3	Psi 3	Psi 5203		ModulePsychology	1				6	2	150	30	15	15		60	60	2			
4	Ped 4	Ped 5204		ModulePedagogy	2				6	2	150	30	30			60	60		2		
		EC 2.2		***Elective component - 8 (600)***																	
5	**DKYa 5**	DKYa 5201		ModuleBusiness Kazakh	2				6	2	150	30		30		60	60		2		
6	**MPTD 6**	MPTD 6202		Module Methodology of teaching technical disciplines	3				6	2	150	30	30			60	60			2	
7	**KTNO 7**	KTNO 6203		ModuleComputer technologies in science and education	3				12	4	300	60	45	15		120	120			4	
				Total ofBD:					**48**	**16**	**1200**	**240**	**150**	**90**		**480**	**480**				
PD - Profile disciplines - 18 (1350)																					
		CC 3.1		***Compulsory component - 6 (450)***																	
1	**TMNE 8**	TMNE 5301		ModuleTheory of modeling and scientific experiment	1				12	4	300	60	15	15	30	120	120	4			
2	**NTPE 9**	NTPE 5302		ModuleScientific-technical problems of EPE	1				6	2	150	30	30			60	60	2			
		EC 3.2		***Elective component - 12 (900)***																	
4	**STE 10**	STE 6301		ModuleNetwork technologies in EPE	2				9	3	225	45	30		15	90	90		3		
5	**EiE 11**	EiE 6302		ModulePower saving and energy audit	3				9	3	225	45	30		15	90	90			3	
	NVIE 16			ModuleNontraditional and renewable sources of energy																	
7		NVIE 5303		Nontraditional and renewable sources of energy	3				9	3	225	45	30		15	90	90			3	
8		PEUVE 6304		Designandoperationofrenewableenergy sets	4				9	3	225	45	45			90	90				3
				Total ofPD:					**54**	**18**	**1350**	**270**	**180**	**15**	**75**	**540**	**540**				
TOTAL credits (hours) of theoretical training									**102**	**34**	**2550**	**510**	**330**	**105**		**1020**	**1020**	**12**	**7**	**12**	**3**
											Number of term projects										
											Number of term works										
											Number of test tasks, prp, pp, summaries,										

												отчетов											
												Number of examinations							5	4	3	1	
P - Practice - 6 (450)																							
1	PP 17	PP 6401	ModulePedagogical practice				4	3	3	90	45								45				
2	PI 18	PI 6402	ModuleResearch practice				3	12	3	360	45						75	240			3		
			Total of P:					**15**	**6**	**450**	**90**						**75**	**285**			**3**		
MSSRW–Master student's scientific-research work - 7 (840)																							
1	NIRM 19	NIRM 6501	ModuleMaster student's scientific-research work including making master's dissertation				1,2,3,4	28	7	840							420	420	1	2	2		
			TotalofMSSRW:					**28**	**7**	**840**							**420**	**420**	**1**	**2**	**2**		
FA –Final attestation - 4 (420)																							
1	OSMD 20	OSMD 6601	ModuleFormatting and defending master's dissertation	4				12	3	315	45						135	135					
2	KE 21	KE 6602	ModuleComplex examination	4				4	1	105	15						45	45					
			Total of FA:					**16**	**4**	**420**	**60**						**180**	**180**					
TOTALcredits:								**161**	**51**	**4260**	**660**						**1695**	**1905**	**13**		**9**	**17**	

C Peer Report for the ASIIN Seal[4]

1. Formal Specifications

Criterion 1 Formal Specifications

Evidence:

- Self-assessment report
- Discussions with representatives of the university [study fees]

Preliminary assessment and analysis of the peers:
The peers noted that according to Kazakh legislations, scholarships are offered to those students applying with the highest grades after completion of high school. They found all formal information to be appropriate.

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

The peers took note of the additional information of the university that students with average grades also may receive scholarships.

Overall, they considered the formal specifications to be adequate to determine the name, awarded degree, duration, intake numbers and study fees. Criterion 1 was deemed fulfilled.

2. Degree programme: Concept & Implementation

Criterion 2.1 Objectives of the degree programme

Evidence:

- Self-assessment report
- Discussions with representatives of the university [objectives, classification]

[4] Includes the assessment for the European seals (EUR-ACE®)

Preliminary assessment and analysis of the peers:
The programmes under review aim at education of power engineers corresponding to the qualifications of the European Qualifications Framework level 6 and 7 respectively. The panel considered this objective to be convincing.

Criterion 2.2 Learning Outcomes of the Programme

Evidence:

- Self-assessment report
- Discussions with representatives of the university [objectives, classification]

Preliminary assessment and analysis of the peers:

The self-assessment report presented a lengthy list of objectives and intended learning outcomes for the Bachelor's and the Master's programme, differentiating between the two levels but not between the two directions of the Master's programme. While the detail of the stated learning outcomes allowed for an insight into the programmes, the panel questioned whether all statements were suitable on the level of the programme *as a whole* and thus would permit both an orientation for the stakeholders as well as point of departure for the coherency approach to be taken by the panel. Despite the number of learning outcomes stated, the peers found many of them to be general and not tailored to the specific programme under review.

To this regard, the peers also took note that the intended learning outcomes as they were written in the self-assessment report were not accessible in the same manner in any formal documents, on the website or the draft diploma supplement. As the intended learning outcomes should be publicly available in one clear and concise manner so that all stakeholders can refer to them and that all quality assurance measures can be tailored towards verifying their actual achievement, the peers saw room for improvement. Furthermore, they also noted that no stakeholders had been involved in the formulation of the learning outcomes and found a need to include them in order to ensure that they are achievable, valid, and reflect currently foreseeable developments in the subject area.

Nevertheless, the peers found that the areas of competence as set forth by the Subject-Specific Criteria to be largely met for the Bachelor's degree programme. In the field of knowledge and understanding students shall have a scientific basis for their work and possess a system of natural-scientific, mathematical and engineering knowledge. Regarding engineering analysis student shall apply methods for carrying out experiments, use relevant equipment and apply corresponding programmes. Engineering design is included in the intention to develop devices of electric power engineering and modeling systems accordingly. Engineering practice is to be acquired during the internships and laboratory

experiments. Transferable skills are stipulated for example in the understanding of moral values, the consequence of professional activities or the ability to work in teams on inter-disciplinary subjects.

As to the Master's degree programmes, the learning outcomes presented did not differentiate between the two directions so that the peers had little indication which different competence profiles were to be achieved. Thus, they stated a need to clarify this in a written manner which would then be subject to the same requirements with regard to publication and stakeholder involvement mentioned above.

The panel found some of the competence areas set forth in the Subject-Specific Criteria to be met. With regard to knowledge and understanding the students should know, for example the latest discoveries in the field while development of up-to-date measures and problem-solving falls in the sphere of engineering analysis. However, neither in the written documentation nor during the discussions were the peers convinced that all students would gain relevant skills in the fields of energy savings and renewable energies. While this was cited as a main area of expected work for the graduates, specifically those of the industrial profile direction, the university representatives only named the thesis development for the acquirement of such skills. The peers questioned whether all Master's graduates would be able to join research teams where they would need to go more deeply into topics such as smart grids or simulation. Master's theses, on the other hand, are not consistently under the supervision of the faculty, particularly when carried out in the industry and solving a specific problem in cooperation with the hosting company.

Furthermore, with regard to engineering design, no mention was made how students would gain relevant skills in the design and development of complex technical systems and services for energy saving systems, renewable energies and grids. As the programme focuses more on the operation of existing systems than the design of new ones, the peers also saw a need for improvement of these competences. In view of the expected large number of graduates to be working in power plants, the peers also found it advisable that skills in *modern* methods of power engineering such as grid integration and grid management should be gained by all graduates. While a number of traditional methods were taught, the future-looking methodologies were lacking, not least taking into account the equipment available (see below). Other areas such as investigation and transferable skills were included in the intended learning outcomes in a satisfactory manner in the peers' opinion.

Criterion 2.3 Learning outcomes of the modules/module objectives

Evidence:

- Module descriptions

Preliminary assessment and analysis of the peers:
The peers were impressed by the extensive documentation presented, largely in at least two languages, during the onsite visit. In addition to the module descriptions attached to the self-assessment report, these included further details about the courses. The module descriptions themselves presented the knowledge, skills and competences to be gained by the students as well as information about credit allocation, exams, teaching staff, etc. in a detailed manner.

The alignment between the overall programme learning outcomes and their representation in the respective modules, however, could not be made, not least because of the deficiencies of the programme learning outcomes detailed below. The panel therefore asked for a concise and clear objectives matrix demonstrating which modules contribute to the achievement of which overall programme learning outcomes, i.e. the intended learning outcomes on programme level. Such a tool would not only help the peers' analysis but also the students and teaching staff in understanding the line-up of modules for achieving the programme objectives.

Criterion 2.4 Job market perspectives and practical relevance

Evidence:

- Analysis of graduates employment in terms of numbers and market sector
- Overview of jobs and companies of graduate employment
- Overview of companies for practical training
- Description of expected learning outcomes

Preliminary assessment and analysis of the peers:

The peers lauded the fact that all graduates easily and shortly after graduation found employment. They credited this among other to the good relations the university has with the local and regional enterprises (see also below). The exposure to engineering practice was considered adequate by the panel.

Criterion 2.5 Admissions and entry requirements

Evidence:

- Rules of admission to the organization of education, implementing professional training programs in higher education, approved by the Government Resolution, January 19, 2012 No 111 (with amendments of April 19, 2012 No 487)

Preliminary assessment and analysis of the peers:

The rules for admission to the Bachelor's and to the Master's degree programmes respectively were considered to be overall adequate by the peer group. While access to the Bachelor's level requires the completion of secondary education as well as passing a nation-wide general tests, for the Master's level the completion of a first cycle programme as well as an English language and a subject-related exam have to be passed. The main aim of this additional exam is to test the qualifications gained through the previous Bachelor's degree.

The peers learned that transfer from or to other higher education institutions nationally or internationally currently is rather seldom. Student exchange is organized, with very few exceptions, with other Russian-speaking countries. The recognition of qualifications gained at other institutions is carried out on an individual basis. With view to the desired increasing of internationalization and, in particular the mobility of students, the peers thus found it necessary that rules for the recognition of activities completed at all other (national and foreign) institutions were adapted.

Criterion 2.6 Curriculum/Content

Evidence:

- Curricular structures
- Discussions with students and teaching staff

Preliminary assessment and analysis of the peers:

The peers assessed the curricula of the programmes under review against the program objectives provided in the self-assessment report as well as against the stipulations of the Subject-Specific Criteria. They considered the curriculum of the Bachelor's degree programme to be overall suitable.

With regard to the Master's degree programmes, specifically the shorter form intended for industrial tasks, the peer group questioned whether the issue of energy saving was sufficiently integrated into the curriculum. While students confirmed that the topic was touched in a number of modules, the peers found no specific content on the expected level of detail equivalent to a Master's level. In particular, the experts learned that the

university puts a high emphasis on the thesis to develop the students' skills in the fields of energy savings and renewable energies. The panel members did not find this procedure sufficient, because it would not guarantee that every student would gain the relevant skills. In particular, the supervision of the thesis is not always under a very direct control of the faculty members and is quite typically used to solve a specific problem rather than to cover a general topic.

The panel also questioned whether the theme of induction machines and synchronous machines could be sufficiently covered in the curriculum as the laboratories at hand (see also below) did not actually provide the appropriate machines used in industry. While the university focused rather on large machines in use in energy plants, the panel found it necessary that students would also be enabled to work with the type of drives which would actually be usable to save energy.

Furthermore, during the discussions with the students, the panel members noted that not all of them found it easy to converse in English despite the fact that mandatory English modules are included in the curricula. While they considered general English to be a first important step, the panel members nevertheless considered that command of subject-relevant English was necessary in order to keep up with current developments of the subject which are mostly published in English and also in order to allow student exchange with non-Russian speaking countries. They therefore recommended that also parts of the subject-specific modules or projects were implemented in English. In consequence, the language capacities of the teaching staff would also need to be enhanced (see below).

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

With regard to the overarching learning outcomes of the programmes as a whole, the peers appreciated the updated objectives matrixes as these allowed a more easy distinction between the different profiles, specifically with regard to the Master's programmes. They noted that the learning outcomes stipulated in these new matrixes did not fully correspond with the ones in the self-assessment report.

Both the publication of the updated overall learning outcomes and the involvement of stakeholders in their further development should nevertheless still be improved (requirement (A.3).

The experts positively acknowledge the revision of the working curricula and a number of modules of the Master's degree programme with the aim of focusing more on design, construction and engineering activities in the profile direction and participation in research, project development and teaching in the pedagogical direction as well as to in-

clude the field of renewable energy sources in the modules “Scientific and technical problems of electric power engineering”, “Energy saving and energy audit”, “Nonconventional and renewable power sources” and “Modern problems of electric power engineering” as well as additional aspects of engineering design in the module “Nonconventional and renewable power sources.”

The peers deemed this to be a step in the right direction but not sufficient to ensure that all students gain skills in these areas to the same degree as expected by the Subject-Specific Criteria (A.6, A.7). They also reinforced their impression that competences in the fields of grid integration of renewable energy ressources and grid control would enhance students` competences in modern power system operation which also should give a deeper system understanding to those graduate working in power plants lateron (E.7).

As the university did not comment on the rules for the recognition of activities, the experts considered a requirement to this regard to be necessary (A.5). Furthermore, the peers encouraged the university to continue the extension of English-taught classes as announced (E.3)

All other aspects of the criterion were considered to be fulfilled.

3. Degree Programme: structures, methods & implementation

Criterion 3.1 Structure and modularity

Evidence:

- Curricular structures
- Discussions with students and teaching staff

Preliminary assessment and analysis of the peers:
According to the peers the modularisation and structure of the curriculum were found to allow for the completion of the degree programme in time and they detected no structural overlaps.

In line with the questions of English language capabilities discussed above the peers considered that the modular structure would allow students to spend a semester or a practical placement abroad but that the level of English might be a main obstacle. Accordingly, most of the students so far implemented their mandatory international internship in other Russian-speaking countries.

Criterion 3.2 Workload and credit points

Evidence:

- Curricular structures
- Module descriptions
- Discussions with students and teaching staff

Preliminary assessment and analysis of the peers:

The panel members analysed the conversion of Kazakh credits into ECTS and learned that a schematic calculation is implemented for the Bachelor's and the two Master's degree programmes taking into account different loads for self-study. The Kazakh credit system already includes some self-study, including the so-called self study periods (SRSP/SIWT) during which students independently solve problems but a lecturer is present and provides help upon request. The panel members also learned that a weekly workload of 57 hours is expected and accepted by students, with 3rd and 4th year students having classes on Saturdays. As a result, this leads to a workload which is much higher than that accepted by the ECTS system and equivalent to that of a full-time employee, namely a maximum of 900h per semester. The panel appreciated the fact that the data on student progress and success rates as well as the statements of the students interviewed did not show any concern about the feasibility of the high workload. However, they noted that the university does not have any mechanisms implemented which would check the actual workloads of the students and consequently allow for amendments when necessary. They therefore questioned whether the workload is actually as high as the credit points would suggest or whether it could be ensured with certainty that structural pressure on the training quality is systematically avoided. Therefore, they considered melioration necessary in this aspect.

Criterion 3.3 Educational methods

Evidence:

- Module descriptions
- Discussions with students and teaching staff
- Catalogue of disciplines (during the onsite visit, in Russian)

Preliminary assessment and analysis of the peers:

The peers lauded the widely used concept of setting out joint student working groups in which Bachelor's and Master's work together on specific projects, not least with a view to the fact that one of the Master's programmes has a pedagogical focus. The audit team also noticed that besides compulsory components a small but sufficient range of elective

and compulsory elective subjects is offered to allow students to develop an individual focus. A corresponding catalogue of disciplines provided during the visit supported this assessment. The teaching methods themselves were rather classical from the peers' point of view but appropriate. The ratio of taught contact hours to self-study was considered adequate.

Criterion 3.4 Support and advice

Evidence:

- Self-assessment report
- Discussions with students and teaching staff

Preliminary assessment and analysis of the peers:
The panel members found that relationships between teaching staff and students to be particularly noteworthy. The students convincingly confirmed that the teaching staff would be their first point of advice for any type of problem, not only directly study-related one. The peers thus noted a very good support of the students.

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

The peers understood that Kazakh regulations accept a student's workload of 57 hours per week. Nevertheless, they did not follow the calculation of the university that this would lead to no more than 855 working hours per semester and thus did not consider this to be in line with ECTS. Accordingly, they found it necessary to revise and adapt the workload and ECTS (A.1).

All other aspects of the criterion were considered to be fulfilled.

4. Examination: System, Concept & Implementation

Criterion 4 Exams: System, concept & implementation

Evidence:

- "Regulations for organizing and carrying out students final attestation at higher educational institutions" adopted by the RK Ministry of Education and Science No 714 of July 12, 2000
- "Regulations for organizing higher educational institutions activity" adopted by the RK Ministry of Education and Science regarding interim exams

Preliminary assessment and analysis of the peers:
The peers generally considered that all aspects regarding the type, organisation, distribution, and grading of examinations were regulated in a satisfactory manner. Nevertheless, they learned that exams with a grade lower than D- could not be repeated but that in these cases students would be obliged to re-take the whole module though in reality the dean could override this rule on an individual basis. The opportunity for repeating a failed exam was thus limited to one time. As this might cause extensions of the standard period of study, the peers considered amendments to be necessary.

The form of exams as found in the module description suggested that mostly written exams were foreseen. The peers learned that individual teaching staff could not change the type of exam as stipulated in the module descriptions but that their corresponding request, i.e. to introduce additional oral exams, would be discussed in the department commission early enough before the exam periods.

The panel considered the number of exams per semester to be acceptable and found their assessment confirmed by the students who commented that sufficient time for preparation before and in between the exams was given.

Regarding the final thesis the peers got the impression that students can carry out an assigned task independently and at the level of the qualification sought.

Compensating disadvantages of handicapped students with regard to time-related and formal guidelines in the studies as well as in the final performance tests and those during the studies is ensured.

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

The peers learned from the additional statement that mandatory attendance of classes was a precondition to be accepted to exams. They appreciated that valid reasons such as illness would allow for exemption from this rule. Nevertheless, the means for repetition of exams still seemed to depend on personal decisions by the faculty management in many cases. They therefore considered it necessary to allow for a more systematic opportunity for repetition (A.2).

All other aspects of the criterion were considered to be fulfilled.

5. Resources

Criterion 5.1 Staff involved

Evidence:

- staff handbook
- list of and information about research projects in the self-assessment report

Preliminary assessment and analysis of the peers:
The peers lauded the motivation and enthusiasm of the teaching staff which highly contributed to the commendable support of students as described above.

The panel was also satisfied with the composition and general backgrounds of the teaching staff. However, as the main research and related publications in the field of electrical power engineering are conducted in English language, the panel would view an improvement of the staff members' English language capabilities favourable. Enhanced language command would allow them to more easily participate in international exchange and conference outside of the Russian-speaking area and would also support the suggested inclusion of English language elements into the subject-related modules and projects (see above).

With a view to the opportunities to conduct high-end research, the peers questioned the teaching load of the staff, in particular that of full professors. During the discussion, they understood that a full professor has a teaching obligation of 12h-16h per week which the peers deemed to be considerably high. In order to fully understand the availability of teaching staff and the related work load, the peers asked for an overview of teaching hours per category of teaching staff (in English language) which had already been shown in Russian during the visit.

Criterion 5.2 Staff development

Evidence:

- list of staff exchanges and external training in the self-assessment
- report discussion with rectorate and teaching staff (international lectures)

Preliminary assessment and analysis of the peers:
The peers noted that some staff members participated in staff exchange programmes and further qualification trainings in companies and higher education institutions in the Russian-speaking region. During the visit, they also learned that the institution organizes a series of conferences and so-called Seginov lectures to which foreign scientists are invited as a means of fostering international communication with scientists in the field. The peers

laud this initiative as exemplary when financial and other restrictions hinder a more widespread exchange. Nevertheless, following up on the issue of language capabilities discussed above, the peers would welcome more options for teaching staff to participate in international conferences, seminars, projects and exchanges, also in non-Russian speaking areas.

Criterion 5.3 Institutional environment, financial and physical resources

Evidence:

- detailed lists of equipment in the self-assessment report
- Visit of laboratories of the faculty for electrical power engineering
- Information on library, indicators, university budget, indicators provided in booklet "General Information" during the onsite visit

Preliminary assessment and analysis of the peers:

Generally, the facilities left a good impression. However, the panel concluded that the equipment at hand in the laboratories of the electric machines department would not allow students and teachers to work at the forefront of their disciplines. Taking into account that a new lab of Schneider Electrics will be shortly opened, they nevertheless considered that modern electrical machines, modern power electronics, a power meter as well as a commercial grid simulation tool would enhance the acquisition of skills in the area of energy savings and smart grid.

On the other hand, the peers positively noted that the university makes very good use of its close connections to the industry and local and regional companies to keep up to date other laboratories such as the FESTO lab. In this regard, the establishment of the so-called Corporate University, a conglomeration of university faculties and companies to foster education, research and application, seemed a sustainable model for cooperation. The peers thus considered the internal and external collaborations to be at a good level.

In the peers' point of view, the financial support of the programme was generally assured for the expected period of accreditation with about 30% of the budget coming from the industry and the rest ensured by the Ministry of Education and Science.

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

The additional document showing the teaching load of different staff categories per year demonstrated to the peers that the difference between annual teaching hours of full professors and other categories such as docents and senior lecturers was significant. Assuming that the other type of work load mentioned for a professor would include research,

they concluded that the working load was comparably high but in principle allowed for an adequate implementation of the programmes. Nevertheless, they considered that a shift from teaching hours to research hours for all teaching staff would enhance the faculty's opportunities for engaging in forefront research projects (E.6). Furthermore, the panel still considered improvements in the English language capacities of teaching staff to be advisable and lauded the announcement of the university to this regard (E.2). They also affirmed that an eased access to international conferences would be beneficial to the further development of the staff members (E.4)

Furthermore, the experts positively noted that the university intends to purchase new equipment, specifically modern synchronous generators low power with permanent magnet as proposed. In order to support the endeavors of the faculty vis-à-vis the rector in this manner, they upheld recommendation E.1.

6. Quality Management: Further Development of Degree Programmes

Criterion 6.1 Quality assurance & further development

Evidence:

- Document General Information provided during the onsite visit: Policy and Aims in the Field of Quality, certified quality management system ISO 9001:1008
- Document General Information provided during the onsite visit: QMS quality management system handbook

Preliminary assessment and analysis of the peers:

The panel gained the impression that the university has appropriately defined its quality aims and understanding for teaching and learning, research and administration. Through the introduction of the ISO quality management system the ground stock has been laid for the achievement of these aims and the implementation of enhancement mechanisms where necessary. The needs of internal and external stakeholders such as students, teachers, graduates, employers and the state are taken into account in the policy development. The interaction with external stakeholders works both through formal and informal means. The Corporate University mentioned above provides a platform for channelling discussions with the industry about their expectations towards graduates' skills as well as feedback on graduates' actual competences. The university also has established a graduates' association with whom lecturers keep in touch in order to receive feedback through questionnaires. Overall, the management handbook provides detailed instruc-

tions for the implementation of quality assurance instruments, data collection and feedback mechanisms (see below). However, the panel gained the impression that the relative of the students' and teachers' experiences did not always fully match the written statements. In particular, while students confirmed that module evaluations were carried out by electronic surveys, they were not informed about the results and therefore felt almost unable to assess whether there were any improvements derived from the evaluation results. Thus, the feedback loops of quality management activities could not yet be considered closed so that the peers recommended further development and *systematic* implementation of the planned procedures.

Criterion 6.2 Instruments, methods and data

Evidence:

- QMS quality management system handbook
- Results of teaching quality assessments
- Data about exam results, pass rates, student numbers, student progress

Preliminary assessment and analysis of the peers:
Overall, the peers concluded that the data collected and the tools foreseen put the university in a position to check whether its aims in general and the objectives of the programmes in particular are achieved. Monitoring of students' progress and control of students' achievements were considered adequate by the peer group.

As mentioned above, the peers pointed out that the current quality assurance system does not foresee a mechanism for identifying whether the student workload allocated through the credit point system is consistent with the actual student workload or whether adjustments would be needed. This should be a concern of the further development of the quality assurance mechanisms.

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

From the statement of the university, the panel learned that students have access to their grades, performance and progress through the electronic university management systems. Nevertheless, the peers considered it essential that students not only have access to their academic data but would also be informed about the results of questionnaires about their courses, teachers' performance etc. Only the systematic publication of such results would close feedback loops in the quality management system (E.5).

The peers found the criterion to be fulfilled.

7. Documentation & Transparency

Criterion 7.1 Relevant Regulations

Evidence:

- QMS 05.02.03 – 2012 organization of educational process for credit training technology, including relevant Rules and Orders of the Government of the Republic of Kazakhstan and the Minister of Education and Science
- QMS MI 110.08-2012 General requirements to organizing and conducting laboratory classes
- QMS SO 4.5.03-2012 Educational and organizational processes management
- QMS SO 4.4.01 - 2012 Managing the process of entrants selection
- QMS SO 1.1.08 - 2012 General requirements to the formation, exposition and execution of working curricula in the European system ECTS
- Rules of graduation thesis (project) implementation in higher education institutions

Preliminary assessment and analysis of the peers:
The peers found that all aspects of admission, assessment, progress and graduation of the students were thoroughly regulated. In particular, they commended the accessibility of documentation and information for students.

Criterion 7.2 Diploma Supplement and Certificate

Evidence:
No samples of the Diploma Supplement were provided.

Preliminary assessment and analysis of the peers:
The peers were provided with samples of diploma certificates and transcripts during the site visit as well as draft Diploma Supplements from other subject areas. They noted that the university had become aware of the necessity and nature of Diploma Supplements only recently in the frame of another accreditation procedure. The university was thus in the process of developing them.

In order to be able to assess the compliance with this criterion, the peers asked as additional document for the English language version of the diploma supplements (not transcript) for all three programmes under review.

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

The panel appreciated the newly submitted Diploma supplement for the Bachelor's degree programme. Generally, they state that a sample of the Diploma Supplement has to be provided *for study programme*. They also noted that there seemed to be some mistakes in the document, e.g. the completion of the programme would not lead to access to PhD studies. Furthermore, the objectives of the programme cited were not programme-specific and thus did not correspond to the ones in the newly delivered objectives matrix. Additionally, no information allowing for a comparative assessment of the graduates final grade (according to the ECTS User's Guide) was provided. Consequently, the peers did not consider this part of the criterion fulfilled and asked for the submission of corrected, specific Diploma Supplements for each programme (A.4).

All other aspects of the criterion were considered fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask 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:

1. English language version of the diploma supplement (not transcript of records) for the programmes
2. Written programme objectives (in the form of learning outcomes) for the two Master's programmes clearly indicating the different profiles
3. An objectives matrix showing which modules contribute to the achievement of which overall programme learning outcomes (LOs on programme level)
4. Overview of teaching hours per category of teaching staff (in English language)

E Comment of the Higher Education Institution (25.02.2014)

The institution provided a detailed statement as well as additional documents on the following issues:

- Objectives matrix for Bachelor's degree programme
- Objectives matrix for Master's degree programme profile direction
- Objectives matrix for Master's degree programme pedagogical direction
- Teaching load per different teaching staff categories
- Sample Diploma Supplement
- Revised module descriptions
- Revised curricula for Master's degree programmes

F Summary: Peer recommendations (05.03.2014)

Taking into account the additional information and the comments given by the university 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 Electric Power Engineering	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering profile direction	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering pedagogical direction	With requirements	EUR-ACE®	30.09.2019

Requirements

For all degree programmes

A 1. (ASIIN 3.2) The students' workload per semester must be set at a level that avoids structural pressure on training quality. In line with the ECTS Users' Guide, the workload per semester must not exceed that of a full-time employee (maximum of 900h). The ECTS credits awarded must be adapted accordingly.

A 2. (ASIIN 4) Students must have sufficient opportunities for repeating failed exams, independent of individual permission by the department, so that the requirement to repeat whole modules does not cause extensions of the standard period of study.

A 3. (ASIIN 2.2) The intended learning outcomes of the programmes as a whole as specified in the updated learning matrixes must be accessible to stakeholders. These must also be involved in the formulation of the learning outcomes.

A 4. (ASIIN 7.2) A programme-specific document (e.g. Diploma Supplement) has to be prepared and handed out to students on a regular basis providing information about the objectives, intended learning outcomes, structure and level of the degree, as well as about an individual's performance.

A 5. (ASIIN 2.5) With view to internationalization and, in particular the mobility of students, rules for the recognition of activities completed at all other (national and foreign) HEIs have to be adapted.

For the Master's degree programme profile direction

A 6. (ASIIN 2.2) It must be ensured that all students gain the relevant skills in the fields of energy savings and renewable energies.

A 7. (ASIIN 2.2 It must be ensured that all students gain relevant skills in the design and development of complex technical systems and services (for energy saving systems, renewable energies and grid integration).

Recommendations

For all degree programmes

E 1. (ASIIN 5.3) It is strongly recommended to complete the equipment in the laboratories so that students have the possibility to gain skills at the forefront of the discipline: modern (also synchronous) electrical machines, modern power electronics, power meter, commercial grid simulation tool.

E 2. (ASIIN 5.1) It is recommended to improve the English skills of the teaching staff in order to facilitate their participation in the latest research and their teaching.

E 3. (ASIIN 2.2) It is recommended to include elements in English language into the subject-specific teaching or projects.

E 4. (ASIIN 5.1, 5.2) It is recommended to facilitate the options for teaching staff to participate in international conferences, seminars, projects and exchanges.

E 5. (ASIIN 6.1) It is recommended to further develop the quality assurance management for the degree programmes and to use the results for continuous improvements. Particularly, feedback loops for the student evaluation should be organized.

E 6. (ASIIN 5.1) It is recommended to decrease the teaching load of full professors in order to improve their research opportunities.

For the Master's degree programme profile direction

E 7. (ASIIN 2.2) It is recommended to reinforce the topics grid integration of renewable energy resources, grid analysis, grid simulation and grid management and control in order to improve the students' competences in modern power system operation.

G Comment of the Technical Committee 02- Electrical Engineering and Information Technology (10.03.2014)

The assessment and the analysis for the award of the ASIIN seal:

The Technical Committee fully supports the assessment of the peers. In fact, the suggested requirements, particularly those for the Master's degree programmes, indicate a number of content-related deficiencies. Nevertheless, the structure-related requirements show similarities to comparable accreditation procedures in Kazakhstan, so that a timeframe of nine months seems to be sufficient to remedy the current shortcomings.

The Technical Committee makes the following editorial amendments: as there are many different means of involving stakeholders into the formulation of programme and learning outcomes, the word "must" is to be replaced by the word "should" in requirement 3. Requirement 4 is targeted at graduates, not students so that the word should be replaced. Recommendation 7 is also additionally based on ASIIN criterion 2.6 Curricular content.

The assessment and the 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 02 – 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 Electric Power Engineering	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering profile direction	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering pedagogical direction	With requirements	EUR-ACE®	30.09.2019

H Decision of the Accreditation Commission (28.03.2014)

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

The Accreditation Commission discussed the procedure. They confirmed the impression of the Technical Committee that the proposed requirements indicate significant deficiencies of the Master's degree programmes. In order to ensure that the university will raise the level of these programmes in a sustainable manner, they add a requirement stipulating that the university presents a concept how they will increase the level of the Master's degree programmes in the mid and long run. This concept should specifically address the issues mentioned in the recommendations, i.e. that the level of the experiments and practical work carried out by students is raised through updated equipment which would allow more sophisticated and modern experiments, or that the content level of the programmes can be increased when teacher can participate more in international conference and do more research.

The assessment and the 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 Committee 02 – Electrical Engineering and Information Technology.

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

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Electric Power Engineering	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering profile direction	With requirements	EUR-ACE®	30.09.2019
Ma Electric Power Engineering pedagogical direction	With requirements	EUR-ACE®	30.09.2019

Requirements

For all degree programmes

A 1. (ASIIN 3.2) The students' workload per semester must be set at a level that avoids structural pressure on training quality. In line with the ECTS Users' Guide, the workload per semester must not exceed that of a full-time employee (maximum of 900h). The ECTS credits awarded must be adapted accordingly.

A 2. (ASIIN 4) Students must have sufficient opportunities for repeating failed exams, independent of individual permission by the department, so that the requirement to repeat whole modules does not cause extensions of the standard period of study.

A 3. (ASIIN 2.2) The intended learning outcomes of the programmes as a whole as specified in the updated learning matrixes must be accessible to stakeholders. These should also be involved in the formulation of the learning outcomes.

A 4. (ASIIN 7.2) A programme-specific document (e.g. Diploma Supplement) has to be prepared and handed out to graduates on a regular basis providing information about the objectives, intended learning outcomes, structure and level of the degree, the Kazakh education system as well as about an individual's performance.

A 5. (ASIIN 2.5) With view to internationalization and, in particular the mobility of students, rules for the recognition of activities completed at all other (national and foreign) HEIs have to be adapted.

For both Master's degree programmes

A 6. (ASIIN 2, 3, 4, 5) A concept has to be elaborated with a medium term strategy of how to strengthen the master level.

For the Master's degree programme profile direction

A 7. (ASIIN 2.2) It must be ensured that all students gain the relevant skills in the fields of energy savings and renewable energies.

A 8. (ASIIN 2.2 It must be ensured that all students gain relevant skills in the design and development of complex technical systems and services (for energy saving systems, renewable energies and grid integration).

Recommendations

For all degree programmes

E 1. (ASIIN 5.3) It is strongly recommended to complete the equipment in the laboratories so that students have the possibility to gain skills at the forefront of the disci-

pline: modern (also synchronous) electrical machines, modern power electronics, power meter, commercial grid simulation tool.

E 2. (ASIIN 5.1) It is recommended to improve the English skills of the teaching staff in order to facilitate their participation in the latest research and their teaching.

E 3. (ASIIN 2.2) It is recommended to include elements in English language into the subject-specific teaching or projects.

E 4. (ASIIN 5.1, 5.2) It is recommended to facilitate the options for teaching staff to participate in international conferences, seminars, projects and exchanges.

E 5. (ASIIN 6.1) It is recommended to further develop the quality assurance management for the degree programmes and to use the results for continuous improvements. Particularly, feedback loops for the student evaluation should be organized.

E 6. (ASIIN 5.1) It is recommended to decrease the teaching load of full professors in order to improve their research opportunities.

For the Master's degree programme profile direction

E 7. (ASIIN 2.2, 2.6) It is recommended to include the grid integration of renewable energy resources and the grid control in order to improve the students` competences in modern power system operation.