



TECHNICAL UNIVERSITY OF VARNA

Ratified by:

Rector:

/Prof. Dragomir Dimitrov, PhD/

CURRICULUM

Professional orientation: **ELECTRICAL ENGINEERING, ELECTRONICS AND AUTOMATION**

Educational and qualification degree: **BACHELOR**

Programme: **RENEWABLE ENERGY SOURCES (in English Language)**

Professional qualification: **ELECTRICAL ENGINEER**

Form of study: **FULL - TIME**

Term of study: **4 YEARS / 8 SEMESTERS**

Number	Subject name	Types of term control				Auditorium load						Unsupervised load	Total work hours	ECTS credits
		Examination	Progressive assessment	Course project	Approved	Lectures	Seminars			Laboratories	Total load			
							Seminar exercises	Course project	Course work					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Mathematics, part 1	*				30	45				75	125	200	8
2	Programming and Using of Computers		*			15				45	60	90	150	6
3	Electrotechnical Documentation		*			15				30	45	105	150	6
4	Practical Material Science				*		15			15	30	70	100	4
5	Foreign Language, part 1				*		30				30	70	100	4
6	<i>Elective Subject</i>				*							30	30	1
a	Specialized Sport Activities, part 1													
b	Adapted Physical Activity*													
7	Practical Training, part 1				*						0	30	30	1
Total for the 1 semester:		1	2	0	4	60	90	0	0	90	240	520	760	30
8	Mathematics, part 2	*				30	45				75	125	200	8
9	Physics		*			30				30	60	65	125	5
10	Electronics	*				30				30	60	65	125	5
11	Theoretical Electrical Engineering, part 1	*				30				30	60	65	125	5
12	English, part 2 Foreign Language, part 2		*				30				30	70	100	4
13	Introduction to Renewable Energy Sources				*		15				15	15	30	1
14	Practical Training, part 2				*							30	30	1
15	<i>Elective Subject</i>				*							30	30	1
a	Specialized Sport Activities, part 2													
b	Adapted Physical Activity*					(30)	(15)				(45)	(75)	(120)	(4)
Total for the 2 semester:		3	2	0	3	120	90	0	0	90	300	465	765	30

Number	Subject name	Types of term control				Auditorium load						Unsupervised load	Total work hours	ECTS credits
		Examination	Progressive assessment	Course project	Approved	Lectures	Seminars			Laboratories	Total load			
							Seminar exercises	Course project	Course work					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	Materials in Electrical Engineering		*			30				15	45	80	125	5
17	Electrical Measurements	*				30				30	60	90	150	6
18	Technical Mechanics		*			15	15				30	60	90	3
19	Theoretical Electrical Engineering, part 2	*				30				30	60	90	150	6
20	MATLAB Introduction		*			15				30	45	80	125	5
21	Thermodynamics and Heat Transfer	*				30				30	60	90	150	6
22	Practical Training, part 3				*							30	30	1
23	<i>Elective Subject</i>				*							30	30	1
a	Specialized Sport Activities, part 3													
b	Adapted Physical Activity*													
Total for the 3 semester:		3	3	0	2	150	15	0	0	135	300	550	850	33
24	Basics of Automatic Control	*				30				30	60	90	150	6
25	Renewable Energy Sources - basic course		*			30				15	45	55	100	4
26	Hydraulics and Pneumatics		*			30				15	45	80	125	5
27	Machine Elements	*				30	15			15	60	90	150	6
28	Heat Exchange Apparatus for Renewable Energy Systems	*				30				15	45	80	125	5
29	Industrial Chemistry		*			30				15	45	80	125	5
30	<i>Elective Subject</i>				*							30	30	1
a	Specialized Sport Activities, part 4													
b	Adapted Physical Activity*													
31	Practical Training, part 4				*							30	30	1
Total for the 4 semester:		3	3	0	2	180	15	0	0	105	300	535	835	33
32	Special Course of Renewable Energy Sources	*				30				15	45	55	100	4
33	Hydrokinetic and Cogeneration Systems		*			30				15	45	80	125	5
34	Photovoltaic Facilities and Solar Power Plants	*				30			15	15	60	90	150	6
35	Electrical Machines, part 1	*				30			15	30	75	100	175	7
36	Electrical Apparatus, part 1	*				30			15	30	75	100	175	7
37	Power Electronic Converters		*			30				30	60	90	150	6
Total for the 5 semester:		4	2	0	0	180	0	0	45	135	360	515	875	35
38	Electrical Machines, part 2	*				30			15	30	75	100	175	7
39	Electrical Apparatus, part 2	*				30			15	30	75	100	175	7
40	Technical Safety		*			30				15	45	55	100	4
41	Heating Installations with Renewable Energy Sources	*				30				30	60	90	150	6
42	Relay Protection	*				30				15	45	80	125	5
43	<i>Elective Subject</i>		*			30				15	45	80	125	5
a	Lighting Systems													
b	Energy Security													

Number	Subject name	Types of term control				Auditorium load						Unsupervised load	Total work hours	ECTS credits
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							Seminar exercises	Course project	Course work					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
44	Specialized Practice				*						0	60	60	2
Total for the 6 semester:		4	2	0	1	180	0	0	30	135	345	565	910	36
45	Sensors and Signal Conditioning		*			30				30	60	90	150	6
46	<i>Elective Subject, project</i>			*				30			30	70	100	4
a	Design of Equipment and Systems for Production of Energy from Renewable Energy Sources - Photovoltaic Systems													
b	Design of Equipment and Systems for Production of Energy from Renewable Energy Sources - Heating Installations with Renewable Energy Sources													
47	Electrical Micromachines	*				30				30	60	90	150	6
48	Electrical Apparatus, part 3	*				30				30	60	90	150	6
49	Wind Plants and Systems	*				30	15			15	60	90	150	6
50	Electromechanical Systems	*				30	15			15	60	90	150	6
Total for the 7 semester:		4	1	1	0	150	30	30	0	120	330	520	850	34
51	Operation, Diagnostics and Repair of Electrical Equipment for Renewable Energy Sources	*				30				30	60	90	150	6
52	<i>Elective Subject</i>	*				30				30	60	90	150	6
a	Systems for Automation of Renewable Energy Sources													
b	Programmable Logic Controllers													
c	Environmental Protection, Conservation and Reproduction													
53	<i>Elective Subject</i>		*			30				15	45	80	125	5
a	Electronic Systems for Renewable Energy Sources													
b	Electrotechnological Devices for Ecological Purposes													
c	Production Management													
54	Testing and Reliability in Renewable Energy Sources	*				30	15			15	60	90	150	6
Total for the 8 semester:		3	1	0	0	120	15	0	0	90	225	350	575	23
Totals for the whole course of education:		25	16	1	12	1140	255	30	75	900	2400	4020	6420	254

Number	Subject name	Types of term control				Auditorium load						Unsupervised load	Total work hours	ECTS credits
		Examination	Progressive assessment	Course project	Approved	Lectures	Seminars			Laboratories	Total load			
							Seminar exercises	Course project	Course work					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Facultative Subjects														
1	Intellectual Property Law	4				30	15				45	60	105	4
2	Commercial Law	3				30	15				45	60	105	4
3	English Language - specialized				4		30				30	30	60	2
4	Company Policy and Entrepreneurial Risk Management	7				30	15				45	60	105	4
5	Team Management	4				30	15				45	60	105	4
6	Industrial Legislation	5				30	15				45	60	105	4
7	Communicative and Behavioral Strategies	7				30	15				45	60	105	4
8	Leadership and Teamwork	6				30	15				45	60	105	4
9	Combustion Engineering and Technologies	6				30				30	60	90	150	6
10	Household Electrical Appliances	5				30				30	60	60	120	4
11	Bulgarian Language				1,2		60				60	60	120	4

Types of graduation	Semester	Unsupervised load	ECTS credits
Preparation of Diploma Thesis / Preparation for State Examination	8	300	10
Defence of Diploma Thesis / State Examination			

Note:

* The discipline "Adapted Physical Activity" is an alternative to "Specialized Sport Activities", it is studied in the second semester and is intended for students who cannot do sports for health reasons.

Approved by the Academic Board of TU-Varna:

Protocol № 22 / 28.10.2024

Modified with Protocols:

Valid from the 2024/2025 academic year.

The weekly allocation of the classes is fixed according to the "Structure of the Learning Process" Academic Board adopted for the current academic year.

Head of Department:
/Prof. B. Aprahamyan, PhD/

Dean of Faculty:
/Assoc. Prof. Y. Rangelov, PhD/