

TECHNICAL UNIVERSITY OF GABROVO
FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record № 9 dated 01.06.2010.

Approved by
Rector /s/

QUALIFICATION REFERENCE

Degree course: **ENVIRONMENTAL PROTECTION TECHNOLOGY AND EQUIPMENT**
Education-qualification degree: **BACHELOR**
Field of higher education: **TECHNICAL SCIENCES**
Professional trend: **5.13 GENERAL ENGINEERING**
Professional qualification: **ENGINEER-ECOLOGIST**

ANNOTATION

This qualification reference specifies the vocational purpose of graduates with Bachelor degree in Environmental protection technology and equipment (EPTE), code 5.1 “General engineering”, as well as corresponding requirements for training.

VOCATIONAL PURPOSE

Successful graduates of the Bachelor degree course in EPTE are trained to follow career as:

- experts and consultants in development of national and regional programs for environmental protection;
- experts in national and regional authorities of environmental protection;
- team workers in teams for valuation of impacts on environment;
- heads of affiliations, units or projects dealing with environmental protection;
- consultants and experts in development of technologies and design of equipment in the respective field;

- organizers, heads of and experts in teams which manufacture, operate, maintain and repair environmental protection equipment;
- developers of normative documents, analyses, forecasts, etc in the field of environmental protection;
- research workers in the field of environmental protection;
- lecturers and trainers in EP(environmental protection);
- specialists in marketing of EPTE.

TRAINING REQUIREMENTS

Specialists who have majored in EPTE acquire fundamental, general education and solid special training in conformity with the profile of general engineering; they possess flexibility, adaptability and the ability to individually improve their knowledge and skills as well as the level of their qualification.

The fundamental training of specialists who major in EPTE is based on the competence in mathematics, physics, chemistry, informatics, materials science, technology of engineering materials, machine elements, metrology and measuring equipment, thermal

engineering and thermodynamics, electrical engineering and electronics, economics.

Wide spectrum specialized training is built-up on knowledge about manufacturing and precision engineering, hydro-pneumatic drives, heat and mass exchange processes, chemical processes in environment, ecology, environmental pollution and its impact on ecological systems, instrumental methods, sensors, devices and equipment for ecological monitoring, systems for measuring and registering, vibration analysis and noise protection, low waste and waste free technologies, chemical and mechanical technologies for purification and treatment of fluids and for treatment of wastes, renewable energy sources, quality management and control.

Specialists who major in EPTE possess a number of specific skills such as computer use, foreign language competence, design, research and development of apparatuses, machines, devices and measuring

systems for environmental protection. They are able to develop and organize ecology oriented technologies; organize and monitor their quality, operate units and devices for ecological monitoring; draft and issue normative documents in the field of OPTE and sustainable development; carry out managerial activity in their affiliations, carry out marketing research, commercial and service activity in the respective branch; train workers and technical staff required for environmental protection, and do research.

AREAS OF REALIZATION

Successful graduates of the bachelor degree course in OPTE are qualified to hold positions as designers, product engineers, trade representatives of companies which manufacture environmental protection equipment, experts in environmental protection or teachers/trainers provided they have acquired a license to teach.

This qualification reference was endorsed by Faculty Council, Record № 4 dated 27.05.2010.

Department Chair /s/

Dean /s/

TECHNICAL UNIVERSITY OF GABROVO
FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record No 9 dated 01.06.2010

Approved by
Rector /s/

Updated with Academic Council resolution
Records № 10 dated 03.07.2012 and № 3 dated 29.10.2013

CURRICULUM

Degree course: **ENVIRONMENTAL PROTECTION TECHNOLOGY AND EQUIPMENT**

Academic degree: **BACHELOR**

Higher education area: **TECHNICAL SCIENCES**

Professional trend: **GENERAL ENGINEERING**

Professional qualification: **ENGINEER-ECOLOGIST**

Form of training: **FULL-TIME**

Duration of training: **4 /FOUR/ YEARS**

№	SUBJECTS TAUGHT	FORMS OF ASSESSMENT E – EXAMINATION CA – CONTINUOUS ASSESSMENT	COURSE-WORK	WORKLOAD IN NUMBER OF ACADEMIC HOURS				WEEKLY DISTRIBUTION L + SC + LC	TYPE OF SUBJECT	ECTS CREDITS T/C
				LECTURES	SEMINAR CLASSES	LABORATORY CLASSES	TOTAL			
1	2	3	4	5	6	7	8	9	10	11
	<i>First Semester</i>									
1.	Calculus, part 1	E		30	30	0	60	2+2+0	C	5/2.3
2.	Informatics	E	CW	30	0	30	60	2+0+2	C	6/2.3
3.	Chemistry	E		30	0	15	45	2+0+1	C	4/1.7
4.	Engineering Graphics, part 1	CA	CW	15	0	30	45	1+0+2	C	5/1.7
5.	Materials Science	E		30	0	30	60	2+0+2	C	6/2.3
6.	Placement			0	0	30	30	0+0+2	C	1/1
7.	Foreign Language			0	30	0	30	0+0+2	E	3/1.1
8.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
	<i>First year, first semester</i>	<i>4E ICA</i>	<i>2CW</i>	<i>135</i>	<i>60</i>	<i>135</i>	<i>330</i>	<i>9+4+9=22</i>		<i>30/12.4</i>

	2	3	4	5	6	7	8	9	10	11
	Second Semester									
9.	Calculus, part 2	E		30	30	0	60	2+2+0	C	5/2.3
10.	Physics	E		30	0	30	60	2+0+2	C	5/2.3
11.	Mechanics, part 1	E	CW	30	30	0	60	2+2+0	C	6/2.3
12.	Technology of Engineering Materials	E		30	0	30	60	2+0+2	C	6/2.3
13.	Engineering Graphics, part 2		CA CW	0	0	30	30	0+0+2	C	4/1.1
14.	Placement			0	0	30	30	0+0+2	C	1/1
15.	Foreign Language		CA	0	30	0	30	0+2+0	E	3/1.1
16.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
	First year, second semester	4 E	2CA	2 CW	120	90	120	330	8+6+8=22	30/12.4
	Third Semester									
17.	Calculus, part 3	E		30	30	0	60	2+2+0	C	5/2.3
18.	Mechanics, part 2		CA CW	30	0	30	60	2+0+2	C	5/2.3
19.	Strength of Materials	E		30	15	15	60	2+1+1	C	6/2.3
20.	Fluid Mechanics	E		30	0	30	60	2+0+2	C	5/2.3
21.	Thermodynamics	E		30	0	30	60	2+0+2	C	5/2.3
22.1	Project Management		CA	30	15	0	45	2+1+0	E	4/1.7
22.2	Industrial Marketing		CA	30	15	0	45	2+1+0	E	4/1.7
23.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
24.	Foreign Language – specialized course		CA	0	60	0	60	0+4+0	O	5/2.3
	Second year, third semester	4 E	2CA	2CW	180	60	105	345	12+4+7=23	30/13.2
	Fourth Semester									
25.	Electrical Engineering and Electronics		CA	30	0	15	45	2+0+1	C	4/1.7
26.	Quality Management Systems		CA	30	15	0	45	2+1+0	C	5/1.7
27.	Metrology	E		30	0	30	60	2+0+2	C	5/2.3
28.	Heat and Mass Transfer	E		30	0	30	60	2+0+2	C	5/2.3
29.	Machine Elements	E		30	0	30	60	2+0+2	C	6/2.3
30.	CAD Systems	E		30	0	30	60	2+0+2	C	5/2.3
31.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
32.	Work Placement, part 1			0	0	0	(120)		C	(4/0)
	Second year, fourth semester	4 E	2CA	1 CW	180	15	135	330	12+1+9=22	30/12.6
	Fifth Semester									
33.	Manufacturing Equipment		CA	30	0	30	60	2+0+2	C	5/2.3
34.	Precision Engineering	E		30	0	30	60	2+0+2	C	5/2.3

1	2	3	4	5	6	7	8	9	10	11
35.	Interchangeability and Standardization	E	CW	30	0	30	60	2+0+2	C	6/2.3
36.	Optical Methods for Control and Analysis	E		45	0	30	75	3+0+2	C	6/2.8
37.	Chemistry of Environment	E		45	0	30	75	3+0+2	C	6/2.8
38.	Optical Methods for Control and Analysis – course project		CA						C	2/0
39.	Economics of Industrial Enterprise		CA	30	15	0	45	2+1+0	O	4/1.7
40.	Physical Education			0	(30)	0	(30)	(0+2+0)	O	(3/1.1)
	Third year, fifth semester	4 E	2CA	2CW	180	0	150	330	12+0+10=22	30/12.5
	Sixth Semester									
41.	Mechanical and Precision Engineering Technology	E		30	0	30	60	2+0+2	C	5/2.3
42.	Computer-Aided Design in Mechanical and Precision Engineering	E		30	0	30	60	2+0+2	C	5/2.3
43.1	Hydraulic and Pneumatic Drives		CA	30	0	15	45	2+0+1	E	4/1.7
43.2	Electric Drives		CA	30	0	15	45	2+0+1	E	4/1.7
44.	Environmental Monitoring and Assessment		CA	30	0	15	45	2+0+1	C	4/1.7
45.	Methods and Instruments in Environmental Monitoring, part 1	E		30	0	30	60	2+0+2	C	5/2.3
46.	Water Treatment Technologies	E		30	0	30	60	2+0+2	C	5/2.3
47.	Mechanical and Precision Engineering Technology-project		CA						C	2/0
48.	Work Placement, part 2			0	0	0	(120)		C	(4/0)
49.	Physical Education			0	(30)	0	(30)	(0+2+0)	O	(3/1.1)
	Third year, sixth semester	4 E	3CA	1CW	180	0	150	330	12+0+10=22	30/12.6
	Seventh Semester									
50.	Methods and Instruments in Environmental Monitoring, part 2	E		30	0	30	60	2+0+2	C	5/2.3
51.	Ecology	E		30	0	30	60	2+0+2	C	5/2.3
52.	Air Filtering Technologies and Equipment	E		45	0	30	75	3+0+2	C	7/2.8
53.	Measuring and Recording Systems	E		45	0	30	75	3+0+2	C	6/2.8
54.	Low-Pollution and Non-Waste Technologies		CA	30	0	30	60	2+02	C	5/2.3
55.	Air Filtering Technologies and Equipment - project		CA						C	2/0
56.	Physical Education			0	(60)	0	(60)	(0+4+0)	O	(5/2.3)
	Fourth year, seventh semester	4 E	2CA		180	0	150	330	12+0+10=22	30/12.5

1	2	3	4	5	6	7	8	9	10	11
	<i>Eighth Semester</i>									
57.	Signal Processing Systems	CA		30	0	10	40	3+0+1	C	3/1.5
58.	Vibration Analysis and Noise Immunity	E		30	0	30	60	3+0+3	C	5/2.3
59.	Waste Treatment Technologies and Equipment	E		30	0	20	50	3+0+2	C	4/1.9
60.	Renewable Energy Sources	E		30	0	20	50	3+0+2	C	4/1.9
61.	Pre-graduation Apprenticeship									4/0
62.	Graduation Thesis Work									10/0
	<i>Fourth year, eighth semester</i>	<i>3E 1CA</i>		<i>120</i>	<i>0</i>	<i>80</i>	<i>200</i>	<i>12+0+8=20</i>		<i>30/7.6</i>
	<i>Total for the entire course of study</i>	<i>31E 15CA</i>	<i>10CW</i>	<i>1275</i>	<i>225</i>	<i>1025</i>	<i>2525</i>			<i>240/95.8</i>

ABBREVIATIONS USED

- C** – compulsory subjects
E – elective subjects
O – optional subjects

SUBJECTS		WORKLOAD	
Type	Number	Hours	%
C	46	2315	91,68
E	6	210	8,32
TOTAL:	52	2525	100
O	5	225	

Note: The numbers quoted in column 11 under the abbreviations T / C refer to: T – total number of credits, C – credits from contact hours.

Endorsed with Faculty Board resolution, Record No 4 dated 27.05.2010.

Updated with Faculty Board resolution, Records № 6 dated 26.06.2012 and № 7 dated 23.10.2013.

Department Chair /s/

Dean /s/