T E C H N I C A L U N I V E R S I T Y O F G A B R O V O
FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record № 9 dated 29.05.2012 .

Approved by
Rector /s/

Q U A L I F I C A T I O N R E F E R E N C E

Degree course: **MECHATRONICS**
Educational-qualification degree: **BACHELOR**
Field of higher education: **TECHNICAL SCIENCES**
Professional trend: **5.1 MECHANICAL ENGINEERING**.
Professional qualification: **MECHANICAL ENGINEER**

ANNOTATION

This qualification reference specifies the vocational purpose of specialists with a Bachelor degree in Mechatronics in the professional trend of Machine Engineering as well as the qualification requirements for their training.

VOCATIONAL PURPOSE

Specialists who have successfully majored in Mechatronics are trained to carry out: engineering research, design engineering, product design engineering, managerial, marketing and other activities related to development and operation of technical systems, plant items, machines and engineering complexes of various purpose and containing mechatronic modules.

TRAINING REQUIREMENTS

Students acquire knowledge and skills in the field of mechanics, electronics, microprocessor engineering, informatics and computerized control all of which form an integral part of machinery, devices and systems in all areas of present day manufacturing within the range between office and household equipment to automobiles and medical instruments. Training is based on priority utilization of CAD/CAM/CAE and DAQ software which enables engineering specialist to adapt more easily to labor market demands both at home and abroad.

AREAS OF PROFESSIONAL REALIZATION

Successful graduates in Mechatronics are well able to find employment positions as: designers of technical systems, plant items, machinery and various purpose complexes containing mechatronic modules in the form of sensor, actuating and control devices as well as of the respective algorithmic and program back-up of computer control. They are well able to hold positions as designers of robots and robotized systems for both industrial and non-industrial purposes; be appointed as service and marketing experts in manufacturing, designing, service and consultancy service companies which employ intelligent mechatronic systems in all areas of production; managers and organizers in the sphere of manufacturing, service, advertisement, trade, education and state administration; specialists in technical diagnostic of machines, devices and assemblies; consultants and auditors of quality management in mechanical engineering, precision engineering, power engineering, metallurgy, etc.

This qualification reference was endorsed with Faculty Council resolution, Record № 5 dated 15.05.2012

Department Chair /s/ Dean /s/

T E C H N I C A L U N I V E R S I T Y O F G A B R O V O
FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record No 9 dated 29 May 2012

Approved by
Rector /s/

Updated with Academic Council resolution
Record № 2 dated 30.09.2014 and № 6 dated 03.02.2015

C U R R I C U L U M

Degree course: **MECHATRONICS**
Academic degree: **BACHELOR**
Higher education area: **TECHNICAL SCIENCES**
Professional trend: 5.1 **MACHINE ENGINEERING**
Professional qualification: **MACHINE ENGINEER**
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	TYPE OF SUBJECT	ECTS CREDITS T / C
				LECT-URES	SEMI-NAR CLAS S-ES	LABORA TORY CLASS-ES	TOTAL	L + SC + LC		
1	2	3	4	5	6	7	8	9	10	11
	First Semester									
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+2+0	E	3/1.1
8.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
	First year, first semester	***4 E 1CA***	***2 CW***	***135***	***60***	***135***	***330***	***9+4+9=22***		***30/12.4***

1	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	E	CW	30	0	30	60	2+0+2	C	5/2.3
19.	Strength of Materials	E	CW	45	15	15	75	3+1+1	C	7/2.8
20.	Fluid Mechanics	CA		30	0	15	45	2+0+1	C	4/1.7
21.	Electrical Engineering	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, part 1			0	60	0	60	0+4+0	O	5/2.3
	Second year, third semester	***4 E 2CA***	***2 CW***	***195***	***60***	***90***	***345***	***13+4+6=23***		***30/13.1***
	Fourth Semester									
25.	Theory of Mechanisms and Machines	CA	CW	30	15	15	60	2+1+1	C	6/2.3
26.	Metrology	E		30	0	30	60	2+0+2	C	5/2.3
27.	Standardization	E		45	0	30	75	3+0+2	C	7/2.8
28.	Equipment and Machinery Components	E		45	0	30	75	3+0+2	C	7/2.8
29.	Thermodynamics	E		30	0	30	60	2+0+2	C	5/2.3
30.	Physical Education			0	(30)	0	(30)	(0+2+0)	E	(3/1.1)
31.	Foreign Language – specialized course, part 1	CA		0	60	0	60	0+4+0	O	5/2.3
32.	Work Placement, part 1			0	0	0	(120)		C	(4/0)
	Second year, fourth semester	***4 E 1CA***	***1 CW***	***180***	***15***	***135***	***330***	***12+1+9=22***		***30/12.5***
	Fifth Semester									
33.	Robotized Modules and Systems in Manufacture	CA		30	0	30	60	2+0+2	C	5/2.3
34.	Components and Assemblies in Mechatronics	E		30	0	30	60	2+0+2	C	5/2.3
35.	Computer Measurement Equipment	E	CW	30	0	30	60	2+0+2	C	6/2.3

1	2	3	4	5	6	7	8	9	10	11
36.	Fundamentals of Technical Optics	E	CW	45	0	30	75	3+0+2	C	6/2.8
37.	Sensors in Mechatronics	E		45	0	30	75	3+0+2	C	6/2.8
38.	Equipment and Machinery Components-Project	CA							C	2/0
39.	Physical Education			0	(60)	0	(60)	(0+4+0)	O	(5/2.3)
40.	Economics of Industrial Enterprise	CA		30	15	0	45	2+1+0	O	4/1.7
41.	Foreign Language – specialized course, part 2			0	60	0	60	0+4+0	O	5/2.3
	Third year, fifth semester	***4 E 2CA***	***2 CW***	***180***	***0***	***150***	***330***	***12+0+10=22***		***30/12.5***
	Sixth Semester									
42.	Technology of Mechatronic Systems	E		30	0	30	60	2+0+2	C	5/2.3
43.	Computer-Aided Design in Mechatronics	E		30	0	30	60	2+0+2	C	5/2.3
44.1	Hydraulic and Pneumatic Drives	CA		30	0	15	45	2+0+1	E	4/1.7
44.2	Electric Drives	CA		30	0	15	45	2+0+1	E	4/1.7
45.	Automatic Control and Adjustment	E		30	0	30	60	2+0+2	C	5/2.3
46.	Registering Components and Devices in Mechatronics	E		30	0	30	60	2+0+2	C	5/2.3
47.	Computer-based Methods for Engineering Analysis	CA		15	0	30	45	1+0+2	C	4/1.7
48.	Course Project on Subject 42	CA							C	2/0
49.	Work Placement, part 2			0	0	0	(120)		C	(4/0)
50.	Foreign Language – specialized course, part 2	CA		0	60	0	60	0+4+0	O	5/2.3
	Third year, sixth semester	***4 E 3CA***		***150***	***0***	***180***	***330***	***10+0+12=22***		***30/12.6***
	Seventh Semester									
51.	Electronics	CA		30	0	30	60	2+0+2	C	5/2.3
52.	Diagnostic of Mechatronic Devices	E		30	0	45	75	2+0+3	C	6/2.8
53.	Quality Management and Control	E		30	0	30	60	2+0+2	C	5/2.3
54.	Visualization Devices in Mechatronics	E		30	0	30	60	2+0+2	C	5/2.3
55.	Instruments for Physicomechanical Quantity Measurement	E	CW	45	0	30	75	3+0+2	C	7/2.8
56.	Course Project on Subject 54	CA							C	2/0
57.	Physical Education			0	(60)	0	(60)	(0+4+0)	O	(5/2.3)
	Fourth year, seventh semester	***4 E 2CA***	***1 CW***	***165***	***0***	***165***	***330***	***11+0+11=22***		***30/12.5***
	Eighth Semester									
58.	Safety Engineering	CA		20	0	10	30	2+0+1	C	2/1
59.	Positioning Systems Controllers	CA		30	0	20	50	3+0+2	C	4/1.9
60.1	Optoelectronics and Laser Technology	E		40	0	40	80	4+0+4	E	6/3
60.2	Optomechatronics	E		40	0	40	80	4+0+4	E	6/3
61.1	Nanotechnology and Engineering	E		30	0	30	60	3+0+3	E	4/2
61.2	Microtechnology and Engineering	E		30	0	30	60	3+0+3	E	4/2

1	2	3	4	5	6	7	8	9	10	11
62.	Pre-graduation apprenticeship									4/0
63.	Graduation Thesis Work									10/0
	Fourth year, eighth semester	***2 E 2CA***		***120***	***0***	***100***	***220***	***12+0+10=22***		***30/7.9***
	Total for the entire course of study	***30E 15CA***	***10 CW***	***1245***	***225***	***1075***	***2545***			***240/95.9***

ABBREVIATIONS USED

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

SUBJECTS		WORKLOAD	
Type	Number	Hours	%
C	42	2255	88.6
E	10	290	11.4
TOTAL:	59	2545	100
O	7	405	16

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 № 5 dated 15.05.2012.

Updated with Department Session resolution, Record № 463 dated 12.09.2014 and № 466 dated 10.12.2014.
Endorsed with Faculty Board resolution, Record № 6 dated 24.09.2014 and № 1 dated 28.01.2015.

Department Chair /s/ Dean /s/