

TECHNICAL UNIVERSITY OF GABROVO
FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record № 1 dated 06.10.2009

Approved by
Rector /s/

QUALIFICATION REFERENCE

Degree course: **HYDRAULIC AND PNEUMATIC ENGINEERING**

Educational-qualification degree: **MASTER**

Field of higher education: **TECHNICAL SCIENCES**

Professional trend: **5.1 MACHINE ENGINEERING**

Professional qualification: **MASTER - ENGINEER**

ANNOTATION

This degree course meets the demand of industry in the field of hydraulic and pneumatic engineering (HPE), water-power engineering, new energy sources and ecology. Training is carried out in accordance with relevant curriculum which corresponds to the requirements for Master's degree and the European standards in the field.

VOCATIONAL PURPOSE

Successful graduates of the Master's degree course in HPE are able to carry out successfully the following activities:

- design of elements and systems for hydraulic and pneumatic drives for machines and equipment;
- organization of manufacturing, assembly, operation and maintenance of various hydraulic and pneumatic machines, elements and equipment;
- work as researchers and dealers in the field of HPE, power engineering and technologies;
- work as experts, consultants and company/ agency managers.

TRAINING REQUIREMENTS

The course is structured as an extension of the bachelor degree course in Hydraulic and pneumatic engineering”.

Academic objectives are attained through in-depth theoretic and specialized training in the following subjects:Hydro-electric Power Plants, Modelling and simulation of dynamic processes, Diagnostic and operation of hydraulic and pneumatic systems, Experimentation theory, Noise and vibrations in hydro-pneumatic systems and machines, Dynamics of automated hydro-pneumatic systems, Non-traditional energy sources and hydro-dynamic grids.

Students who have graduated the bachelor degree course in HPE are eligible to continue their studies in the Master’s degree course.

Bachelor degree holders from other courses who are enrolled in the Master’s degree course in HPE are trained according to an extended curriculum which takes into consideration the professional qualification they have already acquired.

Training is carried out full-time and part-time for two academic semesters.

AREAS OF PROFESSIONAL REALIZATION

- Designers and product engineers in the field of hydraulic and pneumatic energy;
- Managers of production companies or units; centers for development and introduction of modern technologies;
- Experts attached to companies and affiliations;
- Diagnostic workers in the units for diagnostic, maintenance and servicing of machines, and equipment with incorporated hydro-pneumatic elements.

Successful course graduates are eligible to continue their studies in a doctoral degree course or work as academic teachers.

This qualification reference was endorsed by the Faculty Council with Record № 5 dated 23.06.2009.

Department Chair /s/

Dean /s/

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FACULTY OF MECHANICAL AND PRECISION ENGINEERING

Endorsed with Academic Council resolution
Record № 1 dated 06.10.2009

Approved by
Rector /s/

Updated with Academic Council resolution
Record № 2 dated 30.09.2014

CURRICULUM

Degree course: **HYDRAULIC AND PNEUMATIC ENGINEERING**

Academic degree: **MASTER**

Higher education area: **TECHNICAL SCIENCES**

Professional trend: **MECHANICAL ENGINEERING**

Professional qualification: **MASTER-ENGINEER**

Form of training: **FULL-TIME**

Duration of training: **TWO SEMESTERS**

No	SUBJECTS TAUGHT	FORMS OF ASSESSMENT		COURSE-WORK	WORKLOAD ON NUMBER OF ACADEMIC HOURS				WEEKLY DISTRIBUTION	TYPE OF SUBJECT	ECTS CREDITS T / C
		E - EXAMINATION	CA – CONTINUOUS ASSESSMENT		LEC-TURES	SEMINAR CLASSES	LABORATORY CLASS-ES	TOTAL	L + SC + LC		
1	2	3	4	5	6	7	8	1	2	3	4
	<i>First Semester</i>										
1.	Dynamics of Automated Hydraulic and Pneumatic Systems	E			45	15	15	75	3+1+1	C	6/2.8
2.	Modeling and Simulation of Dynamic Processes	E		CW	30	15	30	75	2+1+2	C	6/2.8
3.	Selected Chapters of Mathematics	E			30	15	0	45	2+1+0	C	4/1.7
4.1	Hydrodynamic Screens	E			30	0	15	45	2+0+1	E	4/1.7
4.2	Diagnosis and Operation of Hydraulic and Pneumatic Systems	E			30	0	15	45	2+0+1	E	4/1.7
5.1	Noise and Vibration in Hydraulic and Pneumatic Systems and Equipment	E			30	15	0	45	2+1+0	E	4/1.7

1	2	3	4	5	6	7	8	9	10	11	12
5.2	Theory of Experiment	E			30	15	0	45	2+1+0	E	4/1.7
6.	Computer-based Methods in Mechanics of Uninterrupted Continuum	E			30	0	15	45	2+0+1	C	4/1.7
7.	Dynamics of Automated Hydraulic and Pneumatic Systems - project									C	2/0
8.	Theory and Practice of Entrepreneurship	E			30	15	0	45	2+1+0	O	4/1.7
	First semester	6 E		CW	195	60	75	330	13+4+5		Σ 30
	Second Semester										
9.	Hydro-Electric Power Stations and Pump Stations	E			48	0	16	64	6+0+2	C	5/2.4
10.	Smart Control Automated Hydraulic Systems	E			48	0	16	64	6+0+2	C	5/2.4
11.1	Two-phase Systems	E			24	0	16	40	3+0+2	E	3/1.5
11.2	Hydraulic and Pneumatic Drives of Special Equipment	E			24	0	16	40	3+0+2	E	3/1.5
12.	Pre-graduation Apprenticeship										2/0
13.	Graduation Thesis Work										15
	Second semester	3E			120	0	48	168	15+0+6		Σ 30
	Total for the entire course of study	9E		CW	315	60	123	498			Σ 60

ABBREVIATIONS USED

C – compulsory subjects according to the curriculum

E – elective subjects

O – optional subjects

SUBJECTS		WORKLOAD	
Type	Number	Hours	%
C	7	368	65
E	3	130	35
TOTAL:	10	498	100
O	1	45	

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 23.06. 2009

Updated with Faculty Board resolution, Record № 6 dated 24.09.2014

Department Chair /s/

Dean /s/