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 № 1 dated 06.10.2009

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: **HYDRAULIC AND PNEUMATIC ENGINEEERING**
Master's program: **VENTILATION AND AIR-CONDITIONING EQUIPMENT**
Educational - qualification: **MASTER**
Field of higher education: **TECHNICAL SCIENCES**
Professional trend: **5.1 MACHINE ENGINEERING**
Professional qualification: **MASTER - ENGINEER**

ANNOTATION

The Master's program of this degree course meets the demand of industry for specialists in ventilation and air-conditioning, new energy sources and environmental protection. Training is carried out in accordance with relevant curriculum which corresponds to the requirements for acquisition of Master's degree and all European standards in that particular field.

VOCATIONAL PURPOSE

Successful course graduates in Ventilation and air-conditioning equipment are able to perform well in the following activities:

- design of systems for ventilation and dust removal in industrial premises, administrative buildings and complexes;
- design of systems for air-conditioning in administrative and trade centers, hotels , restaurants and residential buildings;
- design of heating, thermo-pump and drying installations;
- design of systems for renewable energy sources;
- research work in the field of novel technologies for energy efficiency and environmental protection.

TRAINING REQUIREMENTS

The course is structured as an extension of the bachelor degree course in the same major and as specialization in the field of ventilation and air-conditioning equipment and engineering.

Course academic objectives are attained through further theoretic and specialized training in the subjects: Thermodynamic fundamentals of ventilation and air-conditioning, Systems for ventilation and dust removal, Air-conditioning systems, Marketing and management, Experimentation theory,, Computer-based methods in fluid media, Renewable energy sources, Heating and drying equipment, Thermo-pumping installations, Automatic control of ventilation and air-conditioning systems.

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

All successful bachelor degree holders in Hydraulic and Pneumatic Engineering are eligible to continue their studies in this Master's degree course.

Likewise bachelor degree holders in other engineering majors may enroll in the Master's degree course and follow their studies in accordance with an extended and supplemented curriculum which is conformed to their previously acquired professional qualification.

AREAS OF PROFESSIONAL REALIZATION

- Companies dealing with design of ventilation, air-conditioning, heat and gas transfer installations and equipment.
- Heads/Managers of manufacturing companies, units, or centers for development and introduction of modern systems for heating, ventilation, air-conditioning, heat and gas transfer, renewable energy sources;
- Experts in companies and affiliations;
- Engineers in units for diagnostic, maintenance and service of ventilation , air-conditioning, heating, thermal and gas transfer installations and equipment using renewable energy sources;

They also are eligible to continue their studies in a doctoral degree course and work as academic teachers and researchers.

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

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 № 1 dated 06.10.2009

Approved by
Rector /s/

Updated with Academic Council resolution
Record № 2 dated 30.09.2014

C U R R I C U L U M

Degree course: **HYDRAULIC AND PNEUMATIC ENGINEERING**
Master's degree program: **VENTILATION AND AIR-CONDITIONING EQUIPMENT**
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 **E** - EXAMINATION **CA** – CONTINUOUS ASSESSMENT		COURSE-WORK	WORKLOAD ON NUMBER OF ACADEMIC HOURS				WEEKLY DISTRIBUTION	TYPE OF SUBJECT	ECTS CREDITS T / C
					LEC-TURES	SEMINAR CLASSES	LABORATORY CLASS-ES	TOTAL	L + SC + LC		
1	2	3	4	5	6	7	8	9	10	11	12
	First Semester										
1.	Thermodynamic Fundamentals of Air-Conditioning Systems	E			30	0	15	45	2+0+1	C	5/1.7
2.	Construction and Thermal Characteristics of Buildings	E			30	0	15	45	2+0+1	C	5/1.7
3.	Computer-based Methods in Mechanics of Uninterrupted Continuum	E			30	0	15	45	2+0+1	C	4/1.7
4.1	Theory of Similarity	E			30	0	15	45	2+0+1	E	4/1.7
4.2.	Theory and Practice of Heating Experiment	E			30	0	15	45	2+0+1	E	4/1.7
5.	Ventilation and Dust Removal Systems	E			45	15	15	75	3+1+1	C	6/2.8

1	2	3	4	5	6	7	8	9	10	11	12
6.	Air-Conditioning Systems	E			45	15	15	75	3+1+1	C	6/2.8
7.	Selected Chapters of Mathematics	E			30	30	0	60	2+2+0	O	4/1.8
	First year, first semester	**6 E**			**210**	**30**	**90**	**330**	**14+2+6**		**Σ 30**
	Second Semester										
8.	Automatic control of heating, ventilation and air conditioning systems	E			24	0	16	40	3+0+2	C	3/1.5
9.1	Air Purification and Dust Collection Systems	E			24	0	16	40	3+0+2	E	3/1.5
9.2	Heat Pump Installations	E			24	0	16	40	3+0+2	E	3/1.5
10.	Heat and Gas Supply	E			32	0	16	48	4+0+2	C	4/1.8
11.	Heat Engineering	E			24	0	16	40	3+0+2	C	3/1.5
12.	Theory and Practice of Entrepreneurship	E			32	16	0	48	4+0+2	O	4/1.8
13.	Pre-graduation Apprenticeship										2/0
14.	Graduation Thesis Work										15
	First year, second semester	**4E**			**104**	**0**	**64**	**168**	13+0+8		**Σ 30**
	Total for the entire course of study	**10E**			**314**	**30**	**154**	**498**			**Σ 60**

ABBREVIATIONS USED

C – compulsory subjects according to the curriculum
E – elective subjects
O – optional subjects

SUBJECTS		WORKLOAD	
Type	Number	Hours	%
C	8	413	80
E	2	85	20
TOTAL:	10	498	100
O	2	108	

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/