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 № 11 dated 30.06.2009

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: **INDUSTRIAL ENGINEERING**
Master's program: **HEATING, VENTILATION AND AIR-CONDITIONING OF INDUSTRIAL INSTALLATIONS (HVACII)**
Educational-qualification degree: **MASTER**
Field of higher education: **TECHNICAL SCIENCES**
Professional trend: **5.13 GENERAL ENGINEERING**
Professional qualification**: MASTER-ENGINEER**

ANNOTATION

The Master's degree course meets the demand of experts in heating, ventilation and air-condition engineering, new energy sources and environmental protection.Training is carried out in conformity with a preliminary endorsed curriculum for acquisition of Master's degree and the relevant European standards in this field.

VOCATIONAL PURPOSE

Successful graduates of the Master's degree course in "Heating, Ventilation and Air-Conditioning of Industrial Installations"(HVACII) are well able to work in the field of:

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

TRAINING REQUIREMENTS

The course is structured as an extension of the bachelor degree course in Industrial Engineering with an emphasis on specialization in heating, ventilation and air-conditioning equipment.

Academic objectives are attained through supplementary theoretic and specialized training in the following subjects: “Thermodynamic principles of ventilation and air-conditioning”,” systems for ventilation and dust removal”, “Systems for air-conditioning”, “ Heating of industrial installations”, “Marketing and management”, “ Heat and gas supply”, “Computer-based methods in continuous medium mechanics”, “ Drying equipment”, “Thermo-pump installations”, “Automatic control of ventilation and air-conditioning systems”.

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

All holders of bachelor degree in Industrial Engineering are eligible to apply for studies in the course.

Those who are bachelor degree holders in other engineering majors are eligible to enroll in the course in HVACII and continue their studies in compliance with the curriculum which takes into consideration their professional qualification.

AREAS OF PROFESSIONAL REALIZATION

- In companies dealing with design of ventilation, air-conditioning, heat and gas transfer installations and equipment.
- As managers in companies, development centers or production units dealing with the introduction and adoption of modern systems for heating, ventilation and air-conditioning, heat and gas transfer and renewable energy sources;
- Experts in companies and affiliations;
- Engineers in units dealing with diagnostic, maintenance and servicing of ventilation, air-conditioning heat and gas transfer systems and equipment, utilization of renewable energy sources;

Successful graduates of the course may continue their studies in a doctoral degree course and follow a career as academic teachers or research workers.

This qualification reference is endorsed by the Faculty Council with Record № 5 dated 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 No 1 dated 06.10.2009

Approved by
Rector /s/

Updated with Academic Council resolution
Records № 5 dated 12.12.2013 and № 2 dated 30.09.2014

C U R R I C U L U M

Degree course: **INDUSTRIAL ENGINEERING**
Graduate program: **HEATING, VENTILATION AND AIR-CONDITIONING OF INDUSTRIAL INSTALLATIONS**
Academic degree: **MASTER**
Higher education area: **TECHNICAL SCIENCES**
Professional trend: **GENERAL 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	1	2	3	4
	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
3.1	Computer-based Methods in Mechanics of Uninterrupted Continuum	E			30	0	15	45	2+0+1	E	4/1.7
3.2	Applied Hydro-and Gas Dynamics	E			30	0	15	45	2+0+1	E	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

1	2	3	4	5	6	7	8	9	10	11	12
5.	Ventilation and Dust Removal Systems	E			45	15	15	75	3+1+1	C	6/2.8
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 semester	**6 E**			**210**	**30**	**90**	**330**	**14+2+6**		**Σ 30**
	Second Semester										
8.	Automatic Control of Heating, Ventilation and Air Conditioning Systems	И			24	0	16	40	3+0+2	З	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
10.1	Heat and Gas Supply	E			32	0	16	48	4+0+2	E	4/1.8
10.2	Gas Equipment				32	0	16	48	4+0+2	E	4/1.8
11.	Heating of Industrial Facilities	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
	Second semester	**4E**			**104**	**0**	**64**	**168**	13+0+8		**Σ 30**
	Total for the entire course of study	**10E**			**314**	**30**	**154**	**468**			**Σ 60**

ABBREVIATIONS USED

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

SUBJECTS		WORKLOAD	
Type	Number	Hours	%
C	6	320	64.3
E	4	178	35.7
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, Records № 8 dated 04.12.2013 and № 6 dated 24.09.2014

Department Chair /s/ Dean /s/