REPUBLIC OF MACEDONIA

„ Ss. CYRIL AND METHODIUS" UNIVERSITY IN SKOPJE
FACULTY OF MECHANICAL ENGENEERING - SKOPJE

AN ELABORATE

FOR ACCREDITATION OF STUDY PROGRAM, SECOND CYCLE OF UNIVERSITY ACADEMIC STUDIES (ONE YEAR STUDIES)

STUDY PROGRAM

„SUSTAINABLE ENERGY AND ENVIRONMENT"

NOMINATING INSTITUTION

„ Ss. CYRIL AND METHODIUS" UNIVERSITY IN SKOPJE
FACULTY OF MECHANICAL ENGINEERING - SKOPJE

SKOPJE, DECEMBER, 2014

CONTENTS

Proposed by: Faculty's Board **Adopted by: Educational-scientific Council**

USED REGULATIONS

This elaborate for accreditation of the study program for the second cycle studies in Sustainable energy and environment is made in accordance with the provisions of:

- Law on Higher Education ("Official gazette of the Republic of Macedonia" no. 35/2008, 103/2008, 26/2009, 83/2009, 99/2009, 115/210, 17/2011, 51/2011, 123/2012, 15/2013, 24/2013 and 41/2014),
- The Rulebook for the organization, operation, the way of making decision, methodology for evaluation and accreditation, accreditation standards and evaluation, and other issues related to the work of the Board for Accreditation and Evaluation of Higher Education ("Official Gazette of the Republic of Macedonia" " No. 151 / 2012)
- Statute of the University "Ss. Cyril and Methodius" in Skopje
- The Rulebook for adopting study programs ("University messenger" no. 140/2009)
- The Rulebook for the conditions, criteria and rules for enrollment and study of first and second cycle university studies ("University messenger" no. 141/2009)
- Regulation on the norms and standards for the establishment of higher education institutions and to perform higher education ("Official Gazette of the Republic of Macedonia" no. 103/2010 and 168/2010, Annex 2-Classification of scientific-research areas, fields and areas according to the International Frascati classification)
- Regulation on the National Framework for Higher Education qualifications ("Official Gazette of the Republic of Macedonia", br.154 / 2010),
- The Rulebook for obligatory components that study programs should own from his first, second and third cycle ("Official Gazette of the Republic of Macedonia" no. 154/2011 and 25/2011).

1. MAP OF THE HIGHER EDUCATION INSTITUTION

Name of the high education institution	„Ss. Cyril and Methodius" University in Skopje Faculty of Mechanical Engineering - Skopje
Address	P.O.Box 464, 1000 Skopje
Web page	http://www.mf.ukim.edu.mk/
Type of the high education institution (public, private-public non-profit, private non-profit, private profit)	University / Faculty
Data for the founder (private higher education institution)	National assembly of Republic of Macedonia
Data for the last accreditation	First cycle – year 2012 Second cycle – year 2008, 2011, 2012, 2014 Third cycle – year 2011
Study and research areas for which accreditation has been obtained	Research fields: Machinery, Energy, Industrial Engineering and Management, Quality Control, Materials, Environment, Transport, Transportation, Construction and Water Management, Regulation and management of technological processes Scientific research area: Technical and Technological Sciences
Faculty in the higher education institution	**Faculty at „Ss. Cyril and Methodius" University in Skopje 26 members (21 faculties and 5 institutes)**
Study programs that are realized in the unit who requires extension of the activity by introducing new study program	**First cycle:** **a)Four years academic study programs (240 ECTS):** Production Engineering Transport, Mechanization and Logistics Hydraulic Engineering and Water Management Thermal Engineering Materials, Welding and Construction Engineering Industrial Engineering and Management Motor Vehicles Energy and environment Mechatronics Automation and Control Systems **b)Three years academic study programs (180 ECTS):** Production informatics Industrial design Structural design **Second cycle:** **a)Study program for one year Master studies:**

<table>
<tr><td></td><td>Production Engineering
Transport and Logistics
Thermal Engineering
Automatics and fluids engineering
Materials and Welding
Industrial Engineering and Management
Motor Vehicles
Sustainable energy and environment
Mechatronics
Product lifecycle management
Management and Quality Control
b) Name of the study program for two year Master studies:
Industrial design and marketing
Work Safety
Management and Quality Control

Third cycle:
Study program in Machinery
Study program Industrial engineering and management</td></tr>
<tr><td>Data for international cooperation in the field of teaching, research and student mobility</td><td>The Faculty of Mechanical Engineering has international cooperation in the field of teaching, research and student mobility within the CEEPUS mobility program of teaching and student staff, Erasmus and Erasmus + program (signed several agreements with foreign universities, information available at http: //www.ukim.edu.mk/dokumenti_m/431_Erazmus+%20dogovori.doc) and other agreements on international cooperation.</td></tr>
<tr><td>Information about area for teaching and research</td><td>1. Total area (gross area)
(space for teaching and yard)
9918 m^2
2. Total teaching area (net space)
4840 m^2
3. Number of lecture theaters with total number of chairs
lecture theaters with total number of chairs 480
4. Number of classrooms with total number of chairs
24 classrooms with total number of chairs 1111
<table>
<tr><th>no.</th><th>Types of didactic space numeration</th><th>Number of premises</th><th>Area in square metres</th><th>Total seating capacity</th></tr>
<tr><td>1.</td><td>Lecture theaters</td><td>2</td><td>426</td><td>480</td></tr>
<tr><td></td><td>AMF</td><td>1</td><td>228</td><td>300</td></tr>
<tr><td></td><td>225</td><td>1</td><td>198</td><td>180</td></tr>
</table></td></tr>
</table>

	2.	**Classrooms**	**25**	**1628,8**	**1113**
		123	1	87	56
		124	1	87	64
		125	1	75	40
		224	1	111	80
		310	1	127	88
		311	1	76	48
		A1-1	1	88	88
		A1-2 left	1	38	38
		A1-2 right	1	43	28
		A1-3	1	43	28
		A1-5	1	43	28
		F1-2	1	54,5	22
		F2-4	1	60,4	32
		F2-5	1	42,3	18
		F2-6	1	53,3	22
		K2-6	1	44,7	28
		K2-7	1	44,7	25
		K2-15	1	44,7	20
		K3-9	1	80	40
		K3-1	1	55,1	36
		K3-18	1	55,1	36

Information about the equipment for teaching and research

1. Number of classrooms with computer and capacity of computer workplaces

10 classrooms with total 274 workplaces

no.	Types of didactic space numeration	Number of premises	Area in square metres	Total seating capacity
1	**Computer rooms**	**10**	**391**	**274**
	Room 309	1	75	25
	Room 312 Web Lab	1	75	25
	Computer center 1	1	79	30
	Computer center 2	1	84	44
	Room K1-2	1	47,4	24
	Room K1-3	1	47,4	24
	Room K2-8	1	48,3	40

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>Room
K3-18
Idea.lab</td><td>1</td><td>44,7</td><td>12</td></tr>
<tr><td></td><td>Room
F1-1</td><td>1</td><td>35</td><td>22</td></tr>
<tr><td></td><td>Room
A1-4</td><td>1</td><td>43</td><td>28</td></tr>
</table>

2. Number of laboratories for practical teaching …… 21

3. Equipment for performing higher education activities
Equipment value ..... 13.829.470,00 MKD</td></tr>
<tr><td>Number of students that a accreditation is obtained for</td><td>Number of students
450</td></tr>
<tr><td>Number of students (enrolled for the first time)</td><td>Number of regular students on postgraduate studies
209</td></tr>
<tr><td>Number of staff in teaching and research, scientific and teaching positions</td><td>Structure of the teaching staff in teaching science, research, teaching and associate titles
Full professor 36
Associate professor 9
Assistant professor 10</td></tr>
<tr><td>Number of staff with assistant positions</td><td>Structure of associates after teaching science, research, teaching and associate titles
Teaching Assistant 12
Research assistant 7</td></tr>
<tr><td>Teacher : students ratio (number of students per teacher) for each unit separately</td><td>209/55 ≈ 4
450/55 ≈ 8</td></tr>
<tr><td>Internal mechanisms that ensure quality control for the studies</td><td>• Development of teaching contents
• Completion of the teaching process
• Evaluation of students
• Graduation paper,
• Rating the quality of teaching by students with surveys at the end of each semester for each subject,
• Evaluate the quality of the study program by the students in the award of the diploma and
• Other procedures relating to resources and logistics of the teaching process.
• Report for the monitoring of the educational process of the Faculty of Mechanical Engineering in Skopje, academic year 2013/2014</td></tr>
</table>

	(http://www.mf.edu.mk/sites/default/files/files/IZVESHTAJ%20za%20samoevaluacija%20na%20MFS%202013.pdf)
Frequency of self-evaluation process (every year, two years, three years)	In order to provide conditions for continuous improvement of the quality of teaching (educational process) it is provided a self-evaluation in every three years.
Data of last conducted external evaluation of the institution	Report for the subsequent evaluation of Ss Cyril and Methodius University in Skopje for the 2006-07 period to the 2009-10 year. Issued by the European University Association, 2011. New ongoing in 2014.
Other information that the institution wants to specify as an argument for its success	

1a. General qualification descriptors for second cycle one year university studies 60 ECTS at faculty of Mechanical engineering in accordance with the Regulation on the National Framework for higher education qualifications

Level in the national frame of higher education qualifications	Higher education	Level in the European frame of higher education qualifications
VIIA	Second cycle, university, Master academic studies, One year studies 60 ECTS	7

Knowledge and understanding	Shows the knowledge and understanding in scientific research fields Machinery, Energy, Industrial Engineering and Management, Quality Control, Materials, Environment, Transport, Construction and water management, regulation and management of technological processes, and organizational sciences (management) which builds on previous education and training acquired in the first cycle of studies, including knowledge in the domain of theoretical, practical, conceptual, comparative and critical perspectives in scientific fields and areas under the appropriate methodology.
Applying knowledge and understanding	May apply the acquired knowledge and understanding in the field of course programs in a way that shows a thorough, professional and competent approach to solving tasks in work or profession. Shows the competence in identifying, analyzing and solving problems in related scientific areas from the second cycle. Is capable of finding and reliance arguments within the field of study of the second cycle.
Ability assessment	Is capable of collecting, analyzing, evaluating and presenting information, ideas and concepts within the scientific and research realized activities, based on

	relevant acquired data. Making appropriate assessments taking into account the personal, social, scientific research, development and ethical aspects. Capable to evaluate theoretical and practical issues, to form opinion and explain the reasons that lead to certain phenomena and choose an appropriate solution.
Communication skills	Capable to establish contacts, to develop arguments and discuss with professional and lay public for questions and information, ideas, problems, tasks and solutions when deciding criteria and scope of the task is clearly defined and set. Undertakes personal responsibility for issues arising out as a result of team work, the collective results. Is capable of independent participation in a professional and comprehensive approach, in terms of running a specific scientific and interdisciplinary discussions.
Learning skills	Take initiative to identify the needs for gaining further knowledge and learning with a high degree of independence.

1b. Specific qualification descriptors that determine learning outcomes for second cycle one year university studies 60 ECTS at study program Sustainable energy and environment in accordance with the Regulation on the National Framework for higher education qualifications

Knowledge and understanding	Shows the thorough knowledge and understanding in scientific research fields and areas acquired in the second cycle and relate to: • Knowledge of energy sources, ways of transformation and its efficient use • Operation and maintenance of power plants • Regulations and testing of machines and power plants • Technical control, supervision and inspection during the construction of power plants and systems • Development of expert reports on energy machinery and equipment • Knowledge of techniques, rules and measures to protect the environment
Applying knowledge and understanding	Qualified for the study of complex tasks under consideration, showing elements of insight, and can apply knowledge and understanding in a way that indicates a professional approach to the job or profession. Shows the competence in identifying, analyzing and solving problems in related scientific fields studied in the second cycle. He/she is capable of finding and reliance arguments within the field and areas of study.

Ability assessment	Possesses the ability to collect, analyze, evaluate and present information, ideas, concepts of relevant data. Makes appropriate estimates taking into account the personal, social, scientific and ethical aspects. Able to evaluate the theoretical and practical issues in the field of Sustainable energy and environment, to give arguments explaining the causes that give rise to certain phenomena, explaining the rules and choose an appropriate solution.
Communication skills	Develops ability to establish communication and to discuss with the experts, and the lay public, for information, ideas, problems and solutions when deciding criteria and scope of the task is clearly defined. Taking split, separate collective responsibility for results. Is capable of independent participation, professional approach, specific, scientific and interdisciplinary discussions.
Learning skills	Take the initiative to identify the needs for further knowledge acquisition and learning with a high degree of independence, ie estimates of the need for continuous upgrading his knowledge and skills.

2. Decision for adopting the study program by the Academic Council of Scientific unit (faculty of Mechanical engineering – Skopje), or school board of the Independent High School or the Scientific Council of the scientific institution.

The document is attached in Appendix 1 at the end of this elaborate.

3. Decision for adopting the study program from Rector's Office or the University Senate Council or the Council of scientific institution

The document is attached in Appendix 2 at the end of this elaborate.

4. Scientific research field and area of the study program

Study program: Sustainable energy and environment, one year university studies

Scientific research area	Technical and technological sciences
Scientific research field	Mechanical Engineering, Energy, Environment
Scientific research range	Areas of these scientific research fields studied in this course programs according to the study program, as well as areas that correspond to the course programs studied in the study program, and belong in research fields that are not listed.

5. Type of the study program (academic or professional studies)

The type of studies of the Sustainable energy and environment study program in organization of the Faculty of Mechanical engineering in Skopje is academic, university studies.

6. Level of education (first or second cycle)

Sustainable energy and environment study program is organized by the Faculty of Mechanical engineering in Skopje is second cycle, one year studies with 60 ECTS.

7. Purpose and justification for the study program in Sustainable energy and environment

The Faculty of Mechanical Engineering – Skopje at „Ss. Cyril and Methodius" University in Skopje is the leading institution in educating mechanical engineers in this country. In order to satisfy the requirements deriving from foreign investors, but also from domestic manufacturing companies, it is needed constantly educating personnel who have new interdisciplinary knowledge, and successfully responding to global trends. The Institute of Thermal technology and thermal power and the Institute for Hydraulic Engineering and Automation at faculty of Mechanical Engineering in Skopje, suggests study program which results from the previously derived comprehensive analysis and identification of needs and employment opportunities for university graduates in: Research and optimization of energy systems and installations, management and management of energy facilities and systems, energy management systems and systems design, construction and operation of power plants, design and construction of thermal machines and plants, technical inspection and control the design and construction of energy plants and systems, protection environment. Recognizing the basic profile competencies and acquired qualifications in motor vehicles this study program justifies expectations for analysis, exploration of energy sources, ways of transformation and its efficient use, design and construction of thermal machines and facilities, design and construction hydropower and hydro-technical installations and machinery, management and exploitation of thermal and hydraulic plants and systems, regulations and testing of thermal and hydraulic machines and plants, technical control and inspection during construction of thermal and hydraulic plants and systems, expertise and expertise in the field thermal and hydraulic machines and plants, regulations and measures to protect the environment.

Another very important fact of such a study program in English are the provisions of the Law for Higher education which stipulates the minimum necessary study programs at higher education institution. The above reasons are showing the basic elements of social viability and the benefit of this study program and its sustainability in the future.

8. Years and semester duration of the study program

The study program in Sustainable energy and environment is implemented for a period of one year, or two semesters.

9. ECTS credits that the student acquires

With the completion of one year university academic studies of second cycle study program in Sustainable energy and environment, organized by the Faculty of Mechanical Engineering in Skopje, students shall acquire 60 ECTS.

10. Way of financing, and for private higher education institutions and scientific institutions, and proof of quality provided financial assurance for the study program

Covering the costs of the postgraduate study program in Sustainable energy and environment will be done by self-financing by the candidates. The amount, method of payment, and all other conditions are regulated by the conditions, rules and criteria for enrollment and study in the first and second cycle of studies at the University of „Ss. Cyril and Methodius" in Skopje. If the State participates in future, the amount of participation will be taken into account when defining the amount of funds for co-financing.

11. Enrollment conditions

The right to enroll in this study program have students that have completed a university, academic studies and have acquired 240 ECTS, and completed studies in accordance with the law of higher education before the introduction of the ECTS system according to the Bologna Declaration.

The enrollment of students in the second cycle of all study programs will be implemented in accordance with the provisions of the Competition for enrollment of students for the second cycle of „Ss.Cyril and Methodius" University in Skopje.

The teaching boards of the study program will decide for the fulfillment of the similarity of previously completed education.

12. Information for continuing student's education

After completion of the second cycle of university academic studies at the Sustainable energy and environment study program at Faculty of Mechanical Engineering in Skopje, students can continue their education at the third cycle.

13. Fixed ratio between required and elective courses, with a list of required and a list of electives and defined way of selecting courses

The second cycle of university, academic studies at Sustainable energy and environment study program, is organized as a regular one-year (two-semester) study.

The study program is a continuation - deepening the knowledge acquired in the first cycle of university, academic studies for a period of four years.

There are four recognized modules at the second cycle of university studies

1. Module M4 - Knowledge of mathematics and computer science
2. Module M5 - Advanced levels of basic knowledge
3. Module M6 - Advanced levels of specific knowledge
4. Module M7 - Master thesis

One year of university second cycle studies is containing a number of course programs (subjects) that have a certain number of credits, as defined in the course programs.
The structure of annual academic, university studies, second cycle, Sustainable energy and environment study program, is given in Table 1, and the ratio between required and elective courses in Table 2.

Table 1.

No.	**Course programs (subjects)**	**ECTS**	**Winter semester IX**	**Summer semester X**
1.	M4-1 Elective course from table 3	**6**	**6**	
2.	M5-1 Elective course from table 4	**6**	**6**	
3.	M5-2 Elective course from table 4	**6**	**6**	
4.	M5-3 Elective course from table 4	**6**	**6**	
5.	Elective from University list	**6**	**6**	
6.	M6-1 Elective course from table 5	**6**		**6**
7.	M6-2 Elective course from table 5	**6**		**6**
	M7 Master thesis	**18**		**18**
Total credit per semester:			**30**	**30**
Total credit:		**42 ECTS from courses + 18 ECTS from master thesis = 60 ECTS**		

Table 2.

No.	Study Program - subprogram	Duration of the studies (years)/ECTS	Total number/ percentage of the study program	Number / percentage of the compulsory courses by module (60%)	Number / percentage of the elective courses, from study program (30%)	Number / percentage of the elective courses, from University list (10%)
1.	Sustainable Energy and Environment	1 year 60 ECTS	7 100%	0 0 %	6 86 %	1 14 %

Table 3. Elective courses from faculty module M4, knowledge of mathematics and computer science

No.	Course programs (subjects) –one course is elected	ECTS
1.	Selected topics in Applied Mathematics	**6**
2.	Selected topics in informatics	**6**
3.	Probability and Statistics	**6**

Table 4. Elective courses from faculty module M5, advanced levels of basic knowledge

No.	Course programs (subjects) - three courses are elected	ECTS
1.	Modern thermal plants	**6**
2.	Advanced thermodynamics – selected chapters	**6**
3.	Transport and the environment	**6**
4.	Fluid mechanics in environmental engineering	**6**
5.	Environmental measurement methods and monitoring systems	**6**
6.	Environmental systems analysis	**6**
7.	An introduction to eco-innovations	**6**

Table 5. Elective courses from faculty module M6, advanced levels of specific knowledge

No.	Course programs (subjects) - two courses are elected	ECTS
1.	Non-conventional power plants	**6**
2.	Water and waste water treatment	**6**
3.	Energy efficiency	**6**
4.	Eco-engines	**6**
5.	Design of fluid conveying and hydro power system	**6**
6.	Waste management	**6**
7.	Energy vs. sustainable development: Concepts and aspects	**6**
8.	Automation of environmental processes	**6**
9.	Clean fossil and alternative fuels energy	**6**
10.	Experts in teamwork	**6**

The structure of the study program is providing a free course from the list of university courses proposed by each unit of the university, especially to meet the elective 10% under Article 99 of the Law on Higher Education from which students can choose only one course program.

Free list of university course programs are supplemented by all accredited courses from the second cycle (compulsory and elective) at the faculty of Mechanical Engineering in Skopje.

According to the Law on Higher Education the courses are provided in Macedonian language, and courses of certain programs can be conducted in English, to meet the provision in Article 99 of the Law on Higher Education „window for mobility".

14. Information about provided space for the realization of the study program

Postgraduate studies are organized as full-time study with teaching. The Faculty of Mechanical Engineering has sufficient space for the implementation of teaching the first, second and third cycle, which is included in the map of higher education institution. The practical part of teaching is mostly performed in the laboratories of the faculty of Mechanical Engineering, which are also listed in the map of higher education institution.

The course programs envisages clinical teaching as well as recommended in the legislation, which is carried out in the workplace, the economy or the faculty by hiring prominent experts from practice.

15. List of equipment provided for the realization of the study program

The faculty of Mechanical Engineering - Skopje has the following laboratory equipment which is used for teaching:

- Spectrometer System for Field Measurements S::CAN Austria, http://www.s-can.at/
- WTW - Wissenschaftlich-Technische Werkstätten GmbH Germany, http://www.wtw.de
- Portable Data Acquisition System (PDAS) for Ambient vibration measurements
- Spectrophotometers for Laboratory Measurements, Hach-Lange Gmbh Germany, http://shop.hachlange.com
- Portable Radar Flow Meter with Automatic Water Sampler; Hach-Lange Gmbh Germany, http://shop.hach-lange.com
- Ammonia, Nitrate, Chlorine, Potassium, Temperature and pH Ion-Selective Measurement System;
- Nadler Chemische Analysentechnik AG Switzerland, http://www.nadler.ch/
- Dissolved Oxygen and Conductivity Measurement Equipment; S::CAN Austria, http://www.s-can.at/
- Devices for chemical preparation of water,
- Handheld devices for measuring water quality Eureka Manta Multiprobe Logger 3.0, Cond Graphite,
- 4 electrode, Amphibian Display Package ;
- Ultrasonic flowmeter EESIFLO PORTALOK 7S;
- Hiperspectral process photometer spectro::lyser:
- Data acquisition system con::stat - industrial process control terminal (900/1800 MHz GSM);
- Laboratory testing equipment, Laboratory Conductivity Meter, Laboratory Oxygen Meter;
- GPS - Global Positioning Unit, One Frequence R3 GPS system (Base+rover) with post-processing software Trimble Recon;
- Zeta - Meter 3.0 + System with Microscope Unitron FSB 4c;

- Hydraulic system for measurements of small turbine;
- System for laboratory tests of fluidized bed combustion (defining the flow and the temperature in the
- combustion of solid fuels in fluidized bed);
- Portable pressure sensor;
- sensors for fluid pressure
- force sensor
- sensors (of different types) to measure temperature;
- A device for measuring relative humidity and speed;
- Chamber for air conditioning on a certain temperature and relative humidity;
- Chamber of examination and testing of thermal devices;
- Instruments for measuring heat.

16. Course programs information in accordance with Article 4 of the Regulation for obligatory components that should own the study programs from the first, second and third cycle (Official Gazzete of the Republic of Macedonia" no. 21/2011) and the Regulation for changes and supplement of the Regulation for obligatory components that should own the study programs from the first, second and third cycle ("Official Gazzete of the Republic of Macedonia" no. 154/2011)

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Selected topics in applied mathematics			
2.	Code	1M4SEE01			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6
8.	Professor(s)	Prof. dr. Aleksa Malcheski Ass. Prof. dr. Bojan Prangoski			
9.	Prerequisites for enrolling the course	None			
10.	Course objectives (competences): Introduction to selected topics in numerical analysis, optimization, linear algebra, differential equations and complex analysis.				
11.	Course content: Solving problems in numerical mathematics, optimization, differential equations and complex analysis. Application of software tools in solving problems in the topics of the course.				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30+15+40+30+65 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)		30 hours
		15.2.	Lab (student work)		15 hours

16.	Project Work/Assignments	16.1.	Project assignments	40 hours
		16.2.	Individual assignments	30 hours
		16.3.	Self-study	65 hours

17.	Points/Marks:		
	17.1.	Exams	40
	17.2.	Projects	50
	17.3.	Attendance	10

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Activity 16.1	
20.	Language	English	
21.	Course evaluation	Student questionnaire	
22.	Textbooks		

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	R. Fletcher	Practical methods of optimization	John Willey and Sons	2006
2.	Alhfors L.	Complex analysis	McGraw Hill	2009
3.	S. Axler	Linear Algebra Done Right	Springer	2004

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	A. Ralston, P. Rabinowitz	A First Course in Numerical Analysis	Dover Publications	2001

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Selected topics in informatics			
2.	Code	1M4SEE02			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering – Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6

8.	Professor(s)		Prof. Dr. Dushan Chakmakov Ass. Prof. dr. Emilija Celakoska		
9.	Prerequisites for enrolling the course		None		
10.	Course objectives (competences): Design and use of computer databases or use of specific software for engineering applications.				
11.	Course content: Introduction of basic topics in computer databases. Including: relational databases, query language, design and normalization and realization of a database in a chosen DBMS. Alternatively, the students can choose to work in selected computer software for engineering applications according to their interests and future assailments.				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments				
13.	Total hours		6 ECTS x 30 = 180 hours		
14.	Hours allocation per activity:		30+30+60+60=180 hours		
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours	
		15.2.	Lab (student work)	/	
16.	Project Work/Assignments	16.1.	Project assignments	30	
		16.2.	Individual assignments	60	
		16.3.	Self-study	60	
17.	Points/Marks:				
	17.1.	Exams		50	
	17.2.	Projects		50	
	17.3.	Attendance		/	
18.	Grading scale		Under 50	5 (five) (F)	
			51 - 60 points	6 (six) (E)	
			61 - 70 points	7 (seven) (D)	
			71 - 80 points	8 (eight) (C)	
			81 - 90 points	9 (nine) (B)	
			91 - 100 points	10 (ten) (A)	
19.	Prerequisites for taking the final exam				
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				

22.1 Instruction materials				
No.	Author	Title	Publisher	Year
1.	Oppel A.	Database Demystified	McGrow-Hill	2004
2.	Gilat A.	MATLAB An Introduction with Applications	John Wiley & Sons	2011

	22.2	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	Cormen T.H., Leiserson C.E., Rivest R.L., Stein C.	Introduction to Algorithms, 3rd edition	The MIT Press	2009

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Probability and statistics			
2.	Code	1M4SEE03			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6
8.	Professor	Prof. dr. Nikola Tuneski			
9.	Prerequisites	None			
10.	Course objectives (competences): Introduction to the probability and techniques for probability calculations. Usage of elements of statistics and statistical estimates.				
11.	Course content: Combinatory. Theory of probability: classical approach, conditional probability, Bayes formula. Random variables, limit theorems. Elements of statistics: parameter estimates, interval estimates, testing hypothesis.				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30+15+40+30+65 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 week x 2)	30 hours	
		15.2.	Lab (student work)	15 hours	
16.	Project Work/Assignments	16.1.	Project assignments	40 hours	
		16.2.	Individual assignments	30 hours	
		16.3.	Self-study	65 hours	
17.	Points/Marks:				
	17.1.	Exams	40		
	17.2.	Projects	50		
	17.3.	Attendance	10		
18.	Grading scale	Under 50	5 (five) (F)		
		51 - 60 points	6 (six) (E)		
		61 - 70 points	7 (seven) (D)		

			71 - 80 points		8 (eight) (C)
			81 - 90 points		9 (nine) (B)
			91 - 100 points		10 (ten) (A)
19.	Prerequisites for taking the final exam		Activity 16.1		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				
	22.1.	Instruction materials			
		No. Author	Title	Publisher	Year
		1. Walpole R.E., Myers R.H., Myers S.L., Ye K.	Probability & Statistics for Engineering & Scientists	Prentice Hall	2007
		2. J.P. Marques de Sa	Applied Statistics using SPSS, STATISTICA and MATLAB	Springer-Verlag	2003
	22.2.	Supplemental Instruction Materials			
		No. Author	Title	Publisher	Year
		1. Mendenhal W., Sincich T.	Statistics for Engineering and the Sciences	Maxwel Macmillan	1992

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**			
1.	Course title	Modern thermal power plants		
2.	Code	1M5SEE01		
3.	Study group(s)	SEE		
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering – Skopje		
5.	Level (first, second, third)	Second		
6.	Academic year / semester	V / Winter	7. ECTS credits	6
8.	Professor	Prof. dr. Slave Armenski		
9.	Prerequisites	None		
10.	Course objectives (competences): Profound knowledge of modern facilities that analyze, design, analysis and selection of advanced equipment, technical control, supervision and inspection during construction, exploitation and maintenance, environmental protection			
11.	Course content: Modernization of plants with increased energy efficiency; combined cycle cogeneration plants; plants with triple loop-three generation; plants MHDG; hydrogen as fuel; thermal balances; efficiency coefficient; equipment; economic and environmental aspects			

12.	Study methods:			
13.	Total hours		6 ECTS x 30 = 180 hours	
14.	Hours allocation per activity:		30+45+40+30+35= 180 hours	
15.	Lectures/Lab	15.1.	Lectures (15 week x 2)	30 hours
		15.2.	Lab (student work)	45 hours
16.	Project Work/Assignments	16.1.	Project assignments	40 hours
		16.2.	Individual assignments	30 hours
		16.3.	Self-study	35 hours

17.	Points/Marks:		
	17.1.	Tests	50 points
	17.2.	Projects	50 points
	17.3.	Attendance	-

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Accomplished 16.1 and 16.2	
20.	Language	English	
21.	Course evaluation	Student questionnaire	

22. Textbooks

22.1. Instruction materials

No.	Author	Title	Publisher	Year
1.	L. Drbal et al.	Power Plant Engineering	Black&Veatch, Chapman&Haal, New York	1996
2.	Klas Jonhagen:	„Modern Thermal Power Plant- Aspects on Modelling and Evaluation"	Lund University	January, 2011, Sweden

22.2. Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	B.W.Wilkinson, R.W.Barnes	Cogeneration of Electricity and Useful Heat	CRC Press, Inc, Boca Raton, Florida	

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Advanced thermodynamics - selected chapters			
2.	Code	1M5SEE02			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6
8.	Professor	Assoc. prof. Risto Filkoski			
9.	Prerequisites for enrolling the course	None			
10.	Course objectives (competences): To obtain knowledge of the advanced topics in applied thermodynamics and heat transfer related to mechanical engineering, with emphasize to thermal power engineering and environmental protection. The course includes additional thermodynamics relations, including advanced thermodynamic cycles, two- and three-component systems and their applications. The course also covers advanced topics in conduction, convection and radiation heat transfer and related industrial applications. Advanced methods of modelling techniques of fluid flow, turbulence, combustion and heat transfer in engineering applications, with emphasize on numerical modelling. Engineering and scientific approach to the advanced techniques of modelling and simulation of thermal processes. Ability to create and use software applications for design, energy efficiency analysis and operating problems solution of steady-state and dynamic systems in the field of thermal and power engineering.				
11.	Course content: Thermodynamics of irreversible processes. Second law of the classical thermodynamics and irreversible processes. Entropy. Thermodynamic potentials, Helmholtz energy, Gibbs energy, chemical potential, Maxwell relations. Multi-phase systems, phase changes. Chemical equilibrium. Energy and exergy analysis of thermal engineering systems Real gases, Van der Waals equation of state of real gases, equation of corresponding states and other equations. Liquid state. Internal pressure, surface stress and capillary phenomenon. Third law of classical thermodynamics, extensivity, entropy.Flow of compressible fluids. Mixtures and mixing. Binary solutions. Thermodynamics of two- and three component systems. Thermo-mechanical transformations. Thermodynamic processes in thermal machines, facilities and plants. Advanced thermodynamic cycles. Thermodynamic efficiency of the processes, maximal work, maximal technical work - exergy, exergy balance, energy analysis, Grassmann diagram for exergy flow Mass and energy balance of combustion process. Kinetics and dynamics of the combustion process of solid, liquid and gaseous fuels. Heat transfer topics and efficiency. Theory of similarity. Heat transfer in different applications in power engineering and process industry. Selected chapters on fluid flow, turbulence, combustion and heat transfer processes. Computational fluid dynamics (CFD) and computational thermal analysis (CTA). The finite volume method. Discretisation of the governing equations and numerical solution. Numerical domain, object geometry, numerical grid and its evaluation. Modelling of flow processes with				

	chemical reactions. Modelling of combustion. Modelling of heat transfer with CFD/CTA. Convection. Radiation energy transfer. Equation for radiation energy transfer. Modelling of thermal radiation heat transfer by different methods. Time-dependant flow modelling, modelling of transitional processes. CFD technique as a tool for modelling operation of burners, combustors, combustion chambers, boiler plants, industrial furnaces (ovens), other industrial facilities and devices. Modelling of the formation and reduction of air pollutants (CO, NO_x, SO_2, etc.).				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments				
13.	Total hours		6 ECTS x 30 hours = 180 hours		
14.	Hours allocation per activity:		30+30+35+15+60 = 180 hours		
15.	Lectures/Lab	15.1.	Lectures (15 week x 2)	30 hours	
		15.2.	Lab (student work)	30 hours	
16.	Project Work/Assignments	16.1.	Project assignments	35 hours	
		16.2.	Individual assignments	15 hours	
		16.3.	Self-study	60 hours	
17.	Points/Marks:				
	17.1.	Exams		50 points	
	17.2.	Projects		45 points	
	17.3.	Attendance		5 points	
18.	Grading scale		Under 50	5 (five) (F)	
			51 - 60 points	6 (six) (E)	
			61 - 70 points	7 (seven) (D)	
			71 - 80 points	8 (eight) (C)	
			81 - 90 points	9 (nine) (B)	
			91 - 100 points	10 (ten) (A)	
19.	Prerequisites for taking the final exam		Activities 15.2 and 16.1		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				

22.1 Instruction materials				
No.	Author	Title	Publisher	Year
1.	K. Annamalai, I. K. Puri, M. A. Jog,	Advanced Thermodynamics Engineering	CRC Press, 2nd edition	2011
2.	I. D. Holclajtner Antunovic	General course of physical chemistry	ZUNS, University in Belgrade	2000

		3.	Baukal C.E. et al.	CFD in Industrial Combustion	CRC Press	2001
	22.2	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	Baukal C.E. et al.	Heat Transfer in Industrial Combustion	CRC Press	2000
		2.	Filkoski R.	Modelling of energy conversion processes	Faculty of Mechanical Eng., Skopje	2011
		3.	Petrovski K.	Termodinamics, 3rd edition		1999

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Transport and the environment			
2.	Code	1M5SEE03			
3.	Study group(s)	EE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6
8.	Professor	Prof.d-r Mile Dimitrovski Doc.d-r Dame Dimitrovski			
9.	Prerequisites for enrolling the course	None			
10.	Course objectives (competences): Analytical approach to combustion in IC engines, modeling IC engines and technologies for reduction of exhaust emissions. Calculation of real cycles, measuring performance and pollution.				
11.	Course content: Learning the real processes in IC engines, forming pollutants in the chamber of the engine, pollutant behavior after combustion, technologies for pollution reduction in vehicles etc.				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30+30+30+30+60 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures (15week x 2)	30 hours	
		15.2.	Lab (student work)	30 hours	
16.	Project Work/Assignments	16.1.	Project assignments	30 hours	
		16.2.	Individual assignments	30 hours	
		16.3.	Self-study	60 hours	
17.	Points/Marks:				

	17.1.	Exams		50
	17.2.	Projects		45
	17.3.	Attendance		5
18.	Grading scale		Under 50	5 (five) (F)
			51 - 60 points	6 (six) (E)
			61 - 70 points	7 (seven) (D)
			71 - 80 points	8 (eight) (C)
			81 - 90 points	9 (nine) (B)
			91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam		Presented projects	
20.	Language of Instruction		Macedonian	
21.	Course evaluation		Student questionnaire	
22.	Textbooks			

22.1	Instruction materials				
	No.	Author	Title	Publisher	Year
	1.	Mile Dimitrovski, Dame Dimitrovski	ECOGAS software	Internal issue	2010
	2.	Jeremy Colls	Air polution	ISBN 0203-4762-6	2007
22.2	Supplemental Instruction Materials				
	No.	Author	Title	Publisher	Year
	1.	Handbook of Air Pollution from Internal Combustion Engines: Pollutant Formation and Control	Eran Sher	Academic Press	1998
	2.	Transport and the environment	R. E. Hester, R. M. Harrison	RS.C advanced chenical science	2006

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Fluid Mechanics in Environmental Engineering			
2.	Code	1M5SEE04			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	“Ss. Cyril and Methodius” University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6

8.	Professor(s)		Prof. dr. Valentino Stojkovski Assoc. prof. dr. Zoran Markov		
9.	Prerequisites		None		
10.	Course objectives (competences): Learn how to analyze fluid flows in environmental engineering, Simulate flows and investigate turbulence and boundary layer problems				
11.	Course content: Concepts of fluid properties, viscous flow analysis, turbulence, boundary layers, computational fluid dynamics				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours		6 ECTS x 30 hours = 180 hours		
14.	Hours allocation per activity:		30 + 15 + 40 + 30 + 65 = 180 hours		
15.	Lectures/Lab	15.1.	Lectures (15weeks x 2)	30 hours	
		15.2.	Lab (student work)	15 hours	
16.	Project Work/Assignments	16.1.	Project assignments	40 hours	
		16.2.	Individual assignments	30 hours	
		16.3.	Self-study	65 hours	
17.	Points/Marks:				
	17.1.	Exams		40	
	17.2.	Projects		50	
	17.3.	Attendance		10	
18.	Grading scale		Under 50	5 (five) (F)	
			51 - 60 points	6 (six) (E)	
			61 - 70 points	7 (seven) (D)	
			71 - 80 points	8 (eight) (C)	
			81 - 90 points	9 (nine) (B)	
			91 - 100 points	10 (ten) (A)	
19.	Prerequisites for taking the final exam		Activity 16.1		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				

22.1. Instruction materials

No.	Author	Title	Publisher	Year
1.	Rubin H., Atkinson J.	Environmental Fluid Mechanics	Marcel Dekker Inc.	2001
2.	Hirsch C.	Numerical Computation of Internal and External Flows: The Fundamentals of Computational Fluid Dynamics	Butterworth-Heinemann	2007

	22.2.	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	White F. M.	Fluid Mechanics	Mc-Graw Hill	2008

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**					
1.	Course title	Environmental Measurement methods and Monitoring Systems				
2.	Code	1M5SEE05				
3.	Study group(s)	SEE				
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje				
5.	Level (first, second, third)	Second				
6.	Academic year / semester	V / winter	7.	ECTS credits	6	
8.	Professor(s)	Prof. dr. Valentino Stojkovski Ass. Prof dr. Darko Babunski				
9.	Prerequisites	None				
10.	Course objectives (competences): Learn to implement of the dimensional analysis and theory of similarity, to implement of the measurement instrumentation, accuracy of measurements, presentation of the results, Methods and instrumentation for the pressure, flow direction and velocity, discharge, temperature, movement, force and power. Data acquisition hardware & software systems in environmental engineering Software packages for monitoring and control of environmental engineering processes.					
11.	Course content: Implementation dimensional analysis. Implementation the theory of similarity. Implementation of the measurement instrumentation. Accuracy of the measurements and presentation of the results. Pressure measurement. Measurement of the fluid flow direction and flow velocity. Discharge measurement. Temperature measurement. Measurement of concentration and particle size distribution of granular materials, force and power. Analysis of the advantages and disadvantages of continuous environmental monitoring. Comparison of sensors and instruments for continuous monitoring and field measurement. Analysis of the systems for continuous monitoring and control of environmental pollution. Monitoring of municipal and industrial wastewater. Measurement data analysis and techniques. Automatic monitoring stations for municipal and industrial wastewater. Air monitoring: air pollution monitoring and testing equipment, ambient air monitoring, and automatic air pollution monitoring systems.					
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.					
13.	Total hours	6 ECTS x 30 = 180 hours				
14.	Hours allocation per activity:	30+15+40+30+65= 180 hours				
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours		
		15.2.	Lab (student work)	15 hours		
16.	Project Work/Assignments	16.1.	Project assignments	40 hours		

		16.2.	Individual assignments	30 hours
		16.3.	Self-study	65 hours

17.	Points/Marks:		
	17.1.	Exams	40
	17.2.	Projects	50
	17.3.	Attendance	10

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Activity 16.1	
20.	Language	English	
21.	Course evaluation	Student questionnaire	
22.	Textbooks		

22.1. Instruction materials

No.	Author	Title	Publisher	Year
1.	Randy D. Down, Jay H. Lehr	Environmental Instrumentation and Analysis Handbook	Wiley Interscience, Hoboken, NJ	2005
2.	Doebelin E. O.:	Measurement Systems - Application and Design	McGraw-Hill, NY	2002
3.	F. R. Bourden, D. Donnert, T. Godish, I. McKelvie	Environmental Monitoring Handbook	McGraw Hill	2004

22.2. Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	G. Bruce Wiersma	Environmental Monitoring	CRC Press	2004
2.	Janick Artiola, Ian Pepper, Mark Brusseau	Environmental Monitoring and Characterization	Elsevier Academic Press	2004

<table>
<tr><td colspan="2">Add. 3</td><td colspan="6">Course program for the second level (second cycle - postgraduate) of studies</td></tr>
<tr><td>1.</td><td colspan="2">Course title</td><td colspan="5">Environmental Systems Analysis</td></tr>
<tr><td>2.</td><td colspan="2">Code</td><td colspan="5">1M5SEE06</td></tr>
<tr><td>3.</td><td colspan="2">Study group(s)</td><td colspan="5">SEE</td></tr>
<tr><td>4.</td><td colspan="2">The organizer of the study program (unit, institute, department)</td><td colspan="5">“Ss. Cyril and Methodius” University in Skopje, Faculty of Mechanical Engineering – Skopje</td></tr>
<tr><td>5.</td><td colspan="2">Level (first, second, third)</td><td colspan="5">Second</td></tr>
<tr><td>6.</td><td colspan="2">Academic year / semester</td><td colspan="2">V / winter</td><td>7.</td><td>ECTS credits</td><td>6</td></tr>
<tr><td>8.</td><td colspan="2">Professor</td><td colspan="5">Prof. dr. Atanasko Tuneski</td></tr>
<tr><td>9.</td><td colspan="2">Prerequisites</td><td colspan="5">None</td></tr>
<tr><td>10.</td><td colspan="7">Course objectives (competences):
Acquire knowledge of:
- Eleven environmental systems analysis tools: environmental impact assessment (EIA), strategic environmental assessment (SEA), life cycle assessment (LCA), positional analysis (PA), cost-benefit analysis (CBA), material intensity per unit service (MIPS) analysis, total material requirement (TMR) analysis, ecological footprint (EF), exergy analysis, emergy analysis and risk assessment (RA) for chemicals.
- Case study where different environmental systems analysis tools are implemented.</td></tr>
<tr><td>11.</td><td colspan="7">Course content:

DESCRIPTION OF THE ENVIRONMENTAL SYSTEMS ANALYSIS TOOLS. Selecting questions and tools. Environmental Impact Assessment (EIA). Strategic Environmental Assessment (SEA).Life Cycle Assessment (LCA). Positional Analysis (PA). Cost-Benefit Analysis (CBA).Material Intensity per Unit Service (MIPS). Total Material Requirement (TMR). Ecological Footprint (EF).Exergy analysis.Emergy analysis. Risk Assessment (RA) CASE STUDY. Introduction to the case study. Inventory data .Environmental systems analysis (Choice of tools, LCA calculations. MIPS calculations.Ecological footprint calculations. Exergy calculations. Discussion of the case study results
DISCUSSION AND CONCLUSION. Natural resource use. Environmental impacts.Natural resource use and environmental impacts.Usability. Integration .Conclusions</td></tr>
<tr><td>12.</td><td colspan="7">Study methods: lectures, lab, project assignments, individual assignments, self-study.</td></tr>
<tr><td>13.</td><td colspan="3">Total hours</td><td colspan="4">6 ECTS x 30 = 180 hours</td></tr>
<tr><td>14.</td><td colspan="3">Hours allocation per activity:</td><td colspan="4">30 + 15 + 40 + 30 + 65 = 180 hours</td></tr>
<tr><td rowspan="2">15.</td><td rowspan="2">Lectures/Lab</td><td>15.1.</td><td colspan="2">Lectures (15 weeks x 2)</td><td colspan="2">30 hours</td></tr>
<tr><td>15.2.</td><td colspan="2">Lab (student work)</td><td colspan="2">15 hours</td></tr>
<tr><td rowspan="3">16.</td><td rowspan="3">Project Work/Assignments</td><td>16.1.</td><td colspan="2">Project assignments</td><td colspan="2">40 hours</td></tr>
<tr><td>16.2.</td><td colspan="2">Individual assignments</td><td colspan="2">30 hours</td></tr>
<tr><td>16.3.</td><td colspan="2">Self-study</td><td colspan="2">65 hours</td></tr>
<tr><td>17.</td><td colspan="7">Points/Marks:</td></tr>
</table>

	17.1.	Exams		40
	17.2.	Projects		50
	17.3.	Attendance		10
18.	Grading scale		Under 50	5 (five) (F)
			51 - 60 points	6 (six) (E)
			61 - 70 points	7 (seven) (D)
			71 - 80 points	8 (eight) (C)
			81 - 90 points	9 (nine) (B)
			91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam		Activity 16.1	
20.	Language		English	
21.	Course evaluation		Student questionnaire	
22.	Textbooks			

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	Charles H. Eclleston	Environmental Impact Assessment: A Guide to Best Professional Practices	CRC Press	2011
2.	John Glasson, Riki Therivel, Andrew Chadwick	Introduction To Environmental Impact Assessment (Natural and Built Environment Series)	Routledge	2012
3.	Walter Klopffer, Birgit Grahl	Life Cycle Assessment (LCA)	Wiley-VCH	2014

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	Glasson J., Therivel R. and Chadwick A.	Introduction to Environmental Impact Assessment. Principles and procedures, process, practice and prospects.	The Natural and Built Environment Series. T.J. International Ltd, Padstow, UK	1999
2.	Odum, H.T.	Environmental Accounting -	John Wiley & Sons, Inc.,	1996

				Emergy and environmental decision making	New York.	

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**					
1.	Course title	An Introduction to Eco-innovation				
2.	Code	1M5SEE07				
3.	Study group(s)	SEE				
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje				
5.	Level (first, second, third degree)	Second				
6.	Academic year / semester	V / winter	7.	ECTS credits	6	
8.	Professor	Prof. dr Atanas Kochov				
9.	Prerequisites for enrolling the course	None				
10.	Course objectives (competences): This course will contribute toward retains the invaluable core message that eco-innovation and technologies which will contribute toward the sustainable development, have become central to debates about environment and economic development. Containing a substantial number of new boxed case studies, learning outcomes, chapter summaries, discussion questions, further reading and websites, studying and analyzing models of clean technologies, resource efficiency, business models for implementation, this course will provide an essential introduction for students and their competences for developing projects and case studies for sustainable development.					
11.	Course content: This course places stronger emphasis on the global challenges of eco-innovation, clean technologies, resource efficiency and proper usage of resources. The models and tools for eco-innovation approach, business models that should apply will be presented. The course provoke students toward new consideration to the challenge of achieving sustainable development by introducing eco-innovation technologies in to the production processes, and contribute toward the lower carbon growth, climate adaptation and development of rapidly expanding economies.					
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments					
13.	Total hours	6 ECTS x 30 = 180 hours				
14.	Hours allocation per activity:	30+30+30+30+60=180 hours				
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours		
		15.2.	Lab (student work)	30 hours		
16.	Project Work/Assignments	16.1.	Project assignments	30 hours		
		16.2.	Individual assignments	30 hours		
		16.3.	Self-study	60 hours		
17.	Points/Marks:					
	17.1.	Exams		60 points		

	17.2.	Projects			30 points
	17.3.	Attendance			10 points
18.	Grading scale		Under 50		5 (five) (F)
			51 - 60 points		6 (six) (E)
			61 - 70 points		7 (seven) (D)
			71 - 80 points		8 (eight) (C)
			81 - 90 points		9 (nine) (B)
			91 - 100 points		10 (ten) (A)
19.	Prerequisites for taking the final exam		Seminar work delivered and approved		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				
	22.1	Instruction materials			
		No.	Author	Title	Publisher	Year
		1.	Sperber B.	Environmental Sound Technologies for Sustainable Development	Springer-Verlag	2008
		2.	Luken R., Rompaey F.	Environment and Industry in Developing Countries: Assessing the Adoption of Environmentally Sound Technology	Unido Press	2007
		3.	Hermiosilla J., Gonzales P.	Eco-innovation: Sustainability and Competitiveness	MacMillan Bubl.	2009
	22.2	Supplemental Instruction Materials			
		No.	Author	Title	Publisher	Year
		1.	David R. Godschalk	Sustainable Development Projects: Integrating Design, Development, and Regulation	APA Planners Press;	1 edition (April 7, 2014)

Add. 3	**Course program for the first, second and third level (cycle) of studies**					
1.	Course title	Non-conventional power plants				
2.	Code	1M6SEE01				
3.	Study group(s)	SEE				
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering – Skopje				
5.	Level (first, second, third)	Second				
6.	Academic year / semester	V / Summer	7.	ECTS credits	6	
8.	Professor	Prof. dr. Slave Armenski				
9.	Prerequisites	None				
10.	Course objectives (competences): Profound knowledge about unconventional - modern plants to analyze, design, analysis and selection of advanced equipment, technical control, supervision and inspection during construction, exploitation and maintenance, environmental protection					
11.	Course content: Introducing the unconventional modern plants for electricity (solar, geothermal, biomass, solid municipal waste); gaseous fuel plants: thermal cycling: heat balance and heat processes: efficiency coefficient: Equipment: economic and environmental aspects					
12.	Study methods:					
13.	Total hours	6 ECTS x 30 hours = 180 hours				
14.	Hours allocation per activity:	30+45+40+30+35 = 180 hours				
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours		
		15.2.	Lab (student work)	45 hours		
16.	Project Work/Assignments	16.1.	Project assignments	40 hours		
		16.2.	Individual assignments	30 hours		
		16.3.	Self study	35 hours		
17.	Points/Marks:					
	17.1.	Tests	50 points			
	17.2.	Projects	50 points			
	17.3.	Attendance				
18.	Grading scale	Under 50	5 (five) (F)			
		51 - 60 points	6 (six) (E)			
		61 - 70 points	7 (seven) (D)			
		71 - 80 points	8 (eight) (C)			
		81 - 90 points	9 (nine) (B)			
		91 - 100 points	10 (ten) (A)			
19.	Prerequisites for taking the final exam	Accomplished 16.1 and 16.2				
20.	Language	English				
21.	Course evaluation	Student questionnaire				
22.	Textbooks					
	22.1.	No.	Author	Title	Publisher	Year
		1.	B.W.Wilkinson,	Cogeneration of	CRC Press, Inc,	

			R.W.Barnes	Electricity and Useful Heat"	Boca Raton, Florida	
	22.2.	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	P.K.Nag	"Power Plant Engineering", Third Edition	Tata McGray-Hill Publishing Company Limited, New Delhi	2008

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Water and Waste Water Treatment			
2.	Code	1M6SEE02			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third)	Second			
6.	Academic year / semester	V / summer	7.	ECTS credits	6
8.	Professor	Assoc. prof. dr. Zoran Markov			
9.	Prerequisites	None			
10.	Course objectives (competences): Learn how to water treatment works, operation in municipal and industrial treatment plant				
11.	Course content: Water treatment technologies, water quality parameters, waste water treatment, activated sludge processes, water quality laws and regulations				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30 + 15 + 40 + 30 + 65 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours	
		15.2.	Lab (student work)	15 hours	
16.	Project Work/Assignments	16.1.	Project assignments	40 hours	
		16.2.	Individual assignments	30 hours	
		16.3.	Self-study	65 hours	
17.	Points/Marks:				
	17.1.	Exams	40		
	17.2.	Projects	50		
	17.3.	Attendance	10		
18.	Grading scale	Under 50	5 (five) (F)		
		51 - 60 points	6 (six) (E)		
		61 - 70 points	7 (seven) (D)		

		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Activity 16.1	
20.	Language	English	
21.	Course evaluation	Student questionnaire	
22.	Textbooks		

22.1. Instruction materials

No.	Author	Title	Publisher	Year
1.	Lee C.C.	Handbook of Environmental Engineering Calculations	Mc-Graw Hill	2007
2.	Kemer F.N.	The alco Water Handbook	Mc-Graw Hill	

22.2. Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	WEF Manual of Practice No. FD-3	Industrial waste water managment, treatment and disposal	WEF Press	2008

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**			
1.	Course title	Energy efficiency		
2.	Code	1M6SEE03		
3.	Study group(s)	SEE		
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje		
5.	Level (first, second, third)	Second		
6.	Academic year / semester	V / winter	7. ECTS credits	6
8.	Professor	Prof. dr. Done Tashevski		
9.	Prerequisites	None		
10.	Course objectives (competences): Candidates are competent for analysis, modeling, optimization and implementation of different systems for energy efficiency in different areas such as buildings, industry, agriculture and forestry, and transport with introducing a complete energy management in these areas.			
11.	Course content: Methods for analyzing modern systems for energy efficiency. Introdusing the existing models for the calculation of processes and systems for energy			

	efficiency. Ways for optimization and selection of parameters in which optimizes the system in order to meet the energy efficiency criteria. Implementation of analyzed, modeled and optimized systems to specific examples.				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours		6 ECTS x 30 = 180 hours		
14.	Hours allocation per activity:		30 + 15 + 40 + 30 + 65 = 180 hours		
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours	
		15.2.	Lab (student work)	15 hours	
16.	Project Work/Assignments	16.1.	Project assignments	40 hours	
		16.2.	Individual assignments	30 hours	
		16.3.	Self-study	65 hours	
17.	Points/Marks:				
	17.1.	Exams		40	
	17.2.	Projects		50	
	17.3.	Attendance		10	
18.	Grading scale		Under 50	5 (five) (F)	
			51 - 60 points	6 (six) (E)	
			61 - 70 points	7 (seven) (D)	
			71 - 80 points	8 (eight) (C)	
			81 - 90 points	9 (nine) (B)	
			91 - 100 points	10 (ten) (A)	
19.	Prerequisites for taking the final exam		Activity 16.1		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	D. Tashevski	Energy efficiency	Selected lectures and handouts	2014
2.	D.R. Wulfinghoff	Energy efficiency	Energy institute press	1999
3.	P. Bertoldi	Energy efficiency	Springer	2007

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	D. R. Wulfinghoff	Energy Efficiency Manual	Energy institute press	2000

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**					
1.	Course title		Eco engines			
2.	Code		1M6SEE04			
3.	Study group(s)		SEE			
4.	The organizer of the study program (unit, institute, department)		"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)		Second			
6.	Academic year / semester		V / summer	7.	ECTS credits	6
8.	Professor		Prof. d-r Mile Dimitrovski			
9.	Prerequisites for enrolling the course		None			
10.	Course objectives (competences): Analytical approach to combustion in IC engines improving performances of engines, measuring in engines. Understanding hybrid technologies, alternative fuels for IC engines end characteristics.					
11.	Course content: Learning the contemporary models of eco engines, hybrid motor system, engines on gaseous fuels, bio fuels and new fuels. Interaction between engine construction and alternative fuels.					
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments					
13.	Total hours		6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:		30 + 30 + 30 + 30 + 60 =180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)			30
		15.2.	Lab (student work)			30
16.	Project Work/Assignments	16.1.	Project assignments			30
		16.2.	Individual assignments			30
		16.3.	Self-study			60
17.	Points/Marks:					
	17.1.	Exams				50
	17.2.	Projects				45
	17.3.	Attendance				5
18.	Grading scale		Under 50			5 (five) (F)
			51 - 60 points			6 (six) (E)
			61 - 70 points			7 (seven) (D)
			71 - 80 points			8 (eight) (C)
			81 - 90 points			9 (nine) (B)
			91 - 100 points			10 (ten) (A)
19.	Prerequisites for taking the final exam		Presented projects			
20.	Language		English			
21.	Course evaluation		Student questionnaire			
22.	Textbooks					
	22.1	Instruction materials				

		No.	Author	Title	Publisher	Year
		1.	Mile Dimitrovski	ECO Engines	Internal issue	2008
		2.	Handbook of Air Pollution from Internal Combustion Engines: Pollutant Formation and Control	Eran Sher	Academic Press	1998
		3.	Transport and the environment	R. E. Hester, R. M. Harrison	RS.C advanced chenical science	2006
	22.2	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	The biodiesel handbook	Van Gerpen, Knothe and others	AOCS Press, Illinois	2005

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Design of fluid conveying and hydro power system			
2.	Code	1M6SEE05			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third)	Second			
6.	Academic year / semester	V / winter	7.	ECTS credits	6
8.	Professor(s)	Prof. dr. Valentino Stojkovski Assoc. prof. dr. Zoran Markov			
9.	Prerequisites	None			
10.	Course objectives (competences): Introduction to systems for hydraulic and pneumatic convey of fluids. Developing mathematical models for hydraulic calculation of the systems and their components. Introduction to systems for hydro power. Developing mathematical models for hydraulic calculation of the systems and their components.				
11.	Course content: Physical properties of fluids, water, oil, gas and mixtures of fluid - solid particles. Hydraulic and Pneumatic Conveying: calculation, devices and equipment, Hydro power systems: pump stations and hydro power plants: calculation, devices and equipment Techno-economical calculation and economic parameterisation				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30 + 15 + 40 + 30 + 65 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)		30 hours

		15.2.	Lab (student work)	15 hours
16.	Project Work/Assignments	16.1.	Project assignments	40 hours
		16.2.	Individual assignments	30 hours
		16.3.	Self-study	65 hours

17.	Points/Marks:		
	17.1.	Exams	40
	17.2.	Projects	50
	17.3.	Attendance	10

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Activity 16.1	
20.	Language	English	
21.	Course evaluation	Student questionnaire	
22.	Textbooks		

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	Speight J.G.	Natural Gas – A Basic Handbook	Gulf Publishing Company, Houston	2007
2.	Oneil A. Williams	Pneumatic and Hydraulic Conveying of Solids	CRC Press	1983
3.	G.I.Krivcenko	Hydraulic machines-turbiner and pumps	Lewis publisher	1994

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	Wang X., Economides M.	Advanced Natural Gas Engineering	Gulf Publishing Company, Houston, Texas	2009
2.	David Mills,	Pneumatic Conveying Design Guide	ELSEVIER	2004
3.	Frank Yeaple	Fluid Power	CRC Press	1995

				Design Handbook		

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title		Waste management		
2.	Code		1M6SEE06		
3.	Study group(s)		SEE		
4.	The organizer of the study program (unit, institute, department)		"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje		
5.	Level (first, second, third degree)		Second		
6.	Academic year / semester		V / summer	7. ECTS credits	6
8.	Professor		Ass. Prof. d-r Dame Dimitrovski		
9.	Prerequisites for enrolling the course		None		
10.	Course objectives (competences): Able to organize and run efficient (environmental, energy and economically) system for waste management in industry. Understanding the chain of actions for waste management system of a product or a solution for the industry or community. Understanding the applicable technologies for reducing waste, reusing waste or turning waste in to a raw material for further processes.				
11.	Course content: Exploring technical models, equipment and units, regulations for efficient waste management. Systems for waste management in communities and industry. Cain of actions in waste management. Examples for waste reduction. Examples for reusing waste, turning waste in to energy etc.				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments				
13.	Total hours		6 ECTS x 30 = 180 hours		
14.	Hours allocation per activity:		30 + 15 + 45 + 45 + 45=180 hours		
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)		30
		15.2.	Lab (student work)		15
16.	Project Work/Assignments	16.1.	Project assignments		45
		16.2.	Individual assignments		45
		16.3.	Self-study		45
17.	Points/Marks:				
	17.1.	Exams			30
	17.2.	Projects			60
	17.3.	Attendance			10
18.	Grading scale			Under 50	5 (five) (F)
				51 - 60 points	6 (six) (E)
				61 - 70 points	7 (seven) (D)
				71 - 80 points	8 (eight) (C)
				81 - 90 points	9 (nine) (B)
				91 - 100 points	10 (ten) (A)

19.	Prerequisites for taking the final exam		Presented projects		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				
	22.1	Instruction materials			
		No. / Author	Title	Publisher	Year
		1. European commission	Waste management options	EC	2001
		2. Nicholas P. Chermisinoff	Handbook of solid waste management and waste minimization technologies	Butterworth Heinemann	2003
	22.2	Supplemental Instruction Materials			
		No. / Author	Title	Publisher	Year
		1. George Tchobanoglous, Frank Kraith	Handbook of solid waste management	McGraw Hill	2002

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Energy vs. Sustainable Development: Concepts and Aspects			
2.	Code	1M6SEE07			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / summer	7.	ECTS credits	6
8.	Professor	Ass. prof. dr. Ana M. Lazarevska			
9.	Prerequisites for enrolling the course	None			
10.	Course objectives (competences): Introduction to the sustainability concept and aspects implemented on energy systems, both on the demand and the supply side.				
11.	Course content: Introduction to the concept of Sustainable Development (SD), Indicators of SD Implementing the SD concept to energy systems. Modeling and assessment.				
12.	Study methods: Interactive lectures, guest lecturers, auditory practice, work on project assignments/case studies (team work), selfrunning assignments				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30 +15 +40 + 30 + 65 =180 hours			
15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)		30
		15.2.	Lab (student work)		15

16.	Project Work/Assignments	16.1.	Project assignments	40
		16.2.	Individual assignments	30
		16.3.	Self-study	65

17.	Points/Marks:		
	17.1.	Exams	40
	17.2.	Projects	50
	17.3.	Attendance	10

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam	Completed activity 15.2, 16.1. and 16.2 (17.2 & 17.3)	
20.	Language of Instruction	English	
21.	Course evaluation	Student questionnaire	

22. Textbooks

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	S. Bell, S. Morse	Sustainability Indicators: Measuring the immeasurable	EarthScan Publications. Ltd.	2000
2.	T.E. Graedel, B. R. Allenby	Industrial Ecology	Pearson Education Inc.	2003

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	UN CSD	Sustainable Development Knowledge platform	UN	
2	Organisation of Economic Co–operation and Development (OECD)	“Core Set of Indicators for Environmental Performance Reviews”. A synthesis report by the Group on the State of the Environment.	Paris: 39	1993
3	Golay, M., Field, R., Green, Jr. W., Wright, J.C.	Introduction to Sustainable Energy (Online open course-materials)	MIT (http://ocw.mit.edu/courses/nuclear-engineering/22-081j-introduction-to-	2010

					sustainable-energy-fall-2010/)	
		4	D. A. Vallero, P. A. Vesilind	Socially Responsible Engineering: Justice in Risk Management	John Wiley & Sons Inc.,	2007

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Automation of environmental processes			
2.	Code	1M6SEE08			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering – Skopje			
5.	Level (first, second, third)	Second			
6.	Academic year / semester	V / summer	7.	ECTS credits	6
8.	Professor(s)	Ass. prof. dr. Emil Zaev Ass. prof. dr. Darko Babunski			
9.	Prerequisites	None			
10.	Course objectives (competences): Acquire knowledge of: Analysis and design of automation systems for river monitoring and water and wastewater treatment processes. Acquire programming skills in the Matlab platform. Analysis, design and implementation of SCADA systems – Supervisory Control and Data Acquisition and Programmable Logic Controllers (PLC). Functionality and characteristics of environmental measurement systems to monitor and control environmental processes;				
11.	Course content: Introduction to the most commonly used types of control algorithms (sequential, continuous, On-Off and Feedforward control, feedback (P, PI and PID Control) Advanced control algorithms: adaptive, nonlinear, model control) - Examples of implementation of control algorithms in facilities for treatment of drinking water (Basic plant model: Control of pumps, coagulation dosing, pH, purification and sedimentation, filtration and chlorination) plants for wastewater treatment (Control of dissolved oxygen, depth of the sludge refiner) and general control algorithms in the plant, - Control system architecture. Supervisory Control and Data Acquisition (SCADA) and DCS systems (Introduction, SCADA / DCS software, hardware management system (PLC, RTU, Networks), OPC), - Programming and configure the Programmable Logic Controllers (PLC) control subsystem (PLC programming) - Basic instrumentation (instrumentation for measuring flow, temperature, level, pressure and analytical instrumentation).				
12.	Study methods: lectures, lab, project assignments, individual assignments, self-study.				
13.	Total hours	6 ECTS x 30 = 180 hours			
14.	Hours allocation per activity:	30 + 15 + 40 + 30 + 65 = 180 hours			

15.	Lectures/Lab	15.1.	Lectures (15 weeks x 2)	30 hours
		15.2.	Lab (student work)	15 hours
16.	Project Work/Assignments	16.1.	Project assignments	40 hours
		16.2.	Individual assignments	30 hours
		16.3.	Self-study	65 hours

17.	Points/Marks:		
	17.1.	Exams	40
	17.2.	Projects	50
	17.3.	Attendance	10

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)

19.	Prerequisites for taking the final exam	Activity 16.1
20.	Language	English
21.	Course evaluation	Student questionnaire

22. Textbooks

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	AWWA	Water treatment plant design	McGraw-Hill	1990
2.	G. Tchobanoblous	Wastewater Engineering Treatment and Reuse	McGraw-Hill	2003
3.	M.L. Davis	Water and Wastewater Engineering	McGraw Hill	2010.

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	S.A.Boyer	SCADA: Supervisory Control and Data Acquisition	ISA - The Instrumentation, Systems, and Automation Society	1999
2.	W. Bolton	Programmable Logic Controllers	Elsevier	2009

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**				
1.	Course title	Clean fossil and alternative fuels energy			
2.	Code	1M6SEE09			
3.	Study group(s)	SEE			
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje			
5.	Level (first, second, third degree)	Second			
6.	Academic year / semester	V / summer	7.	ECTS credits	6
8.	Professor	Assoc. prof. dr. Risto Filkoski			
9.	Prerequisites for enrolling the course	None			
10.	Course objectives (competences): Acquiring knowledge about the methods and techniques for efficient utilisation of fossil and alternative fuels. Acquiring knowledge regarding energy technologies for environmental protection that apply to combustion plants. Analysis, calculation and optimal performance of combustion systems. Modelling and simulation techniques of aerodynamics, combustion and heat transfer in thermal energy systems (boilers, combustors, furnaces, heat exchangers etc.).				
11.	Course content: Properties of fossil and alternative fuels. Energy transformations of fuels: combustion, pyrolysis, gasification, liquefaction. Mass and energy balance of combustion process. Kinetics and dynamics of fuels combustion. Processing and handling of solid fuels. Methods and techniques for combustion of solid fuels, examples of application. Processing and handling of liquid and gaseous fuels. Methods and techniques for combustion of solid fuels, examples of application. Environmental considerations. Classification of pollutants, sources of plant emissions and discharges. Air pollution control. Techniques for reduction of solid particles emission. Thermodynamics and kinetics of SO_2 formation. Methods and techniques for SO_2 emission reduction. Thermodynamics and kinetics of NO_x formation. Methods and techniques for NO_x emission reduction. Methods and techniques for combined $deSO_2/deNO_x$. Methods for CO emission reduction. Greenhouse gases emission. Methods and techniques for reduction of GHG emission. Modelling, simulation and optimisation techniques of burners, combustion chambers, boiler plants, furnaces, thermal energy facilities. Modelling of the pollutants formation and reduction.				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, selfrunning and/or team work on project assignments, selfrunning assignments				
13.	Total hours	6 ECTS x 30 hours = 180 hours			
14.	Hours allocation per activity:	30+ 30 + 40 + 30 + 50 = 180 hours			
15.	Lectures/Lab	15.1.	Lectures	30 hours	
		15.2.	Lab (student work)	30 hours	
16.	Project Work/Assignments	16.1.	Project assignments	40 hours	

		16.2.	Individual assignments		30 hours
		16.3.	Self-study		50 hours
17.	Points/Marks:				
	17.1.	Exams			50 points
	17.2.	Projects			45 points
	17.3.	Attendance			5 points
18.	Grading scale			Under 50	5 (five) (F)
				51 - 60 points	6 (six) (E)
				61 - 70 points	7 (seven) (D)
				71 - 80 points	8 (eight) (C)
				81 - 90 points	9 (nine) (B)
				91 - 100 points	10 (ten) (A)
19.	Prerequisites for taking the final exam		Activities 15.2 and 16.1		
20.	Language		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				

22.1 Instruction materials

No.	Author	Title	Publisher	Year
1.	Edited by J.B. Kitto and S.C. Stultz	Steam, It's generation and use, Ed. 41	The Babcock & Wilcox Compaany	2005
2.	Baukal C.E. et al.	CFD in Industrial Combustion	CRC Press	2001
3.	Group of authors	IPPC, Ref. Document on BAT for Large Combustion Plants	European Commission, Seville	2006

22.2 Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.	Warner, Davis and Wark	Air Pollution: Its Origin and Control, 3rd Edition	Addison-Wesley-Longman	2003
2.	Petrovski I. J.	Steam Boilers, 2nd ed.	UKIM	2009
3.	Baukal C.E. et al.	Heat Transfer in Industrial Combustion	CRC Press	2000

Add. 3	**Course program for the second level (second cycle - postgraduate) of studies**					
1.	Course title	Experts in Teamwork (EiT)				
2.	Code	1M6SEE10				
3.	Study group(s)	SEE				
4.	The organizer of the study program (unit, institute, department)	"Ss. Cyril and Methodius" University in Skopje, Faculty of Mechanical Engineering - Skopje				
5.	Level (first, second, third degree)	Second				
6.	Academic year / semester	VI / winter	7.	ECTS credits	10	
8.	Professor	Assoc. prof. dr. Zoran Markov Ass. prof. dr. Dame Dimitrovski				
9.	Prerequisites for enrolling the course	None				
10.	Course objectives (competences): Experts in Teamwork is a course in which students apply their academic competence in interdisciplinary project work to learn cooperative skills that can be transferred to the workplace. Relevant issues from society and working life form the basis for the project work, and the student teams should work together with external partners. The student team must adapt the project that the team members choose, to suit their combined competence and the theme of the group. Students develop teamwork skills by reflecting on and learning from specific cooperative situations in their project work. Reflections are shared by the team and are stimulated by facilitation, reflection writings, interaction exercises, and feedback to each other.					
11.	Course content: Students in EiT are divided into groups of students, and each group is divided into interdisciplinary teams of five to six students. Each group is headed by a professor, called the group supervisor. Each group has a broad overall academic theme related to societal issues or challenges from working life. This theme forms the basis for the student team's project work. The group may have external partners that represent the theme, and that may be advisers and recipients of the students' work. The desired combination of academic competencies in the group is specified as a guide to help students choose a group.					
12.	Study methods: team work on project assignments, selfrunning assignments					
13.	Total hours	10 ECTS x 30 hours = 300 hours				
14.	Hours allocation per activity:	45+45+45+45+120=300				
15.	Lectures/Lab	15.1.	Lectures	45 hours		
		15.2.	Lab (student work)	45 hours		
16.	Project Work/Assignments	16.1.	Project assignments	45 hours		
		16.2.	Individual assignments	45 hours		
		16.3.	Self-study	120 hours		
17.	Points/Marks:					
	17.1.	Exams	40			
	17.2.	Projects	50			

	17.3.	Attendance			10
18.	Grading scale		Under 50		5 (five) (F)
			51 - 60 points		6 (six) (E)
			61 - 70 points		7 (seven) (D)
			71 - 80 points		8 (eight) (C)
			81 - 90 points		9 (nine) (B)
			91 - 100 points		10 (ten) (A)
19.	Prerequisites for taking the final exam		Activity 16.1 and 16.2		
20.	Language of Instruction		English		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				
	22.1	Instruction materials			
		No. Author	Title	Publisher	Year
		1. Bjørn Sortland, http://www.ntnu.edu/eit	Course materials 2014, NTNU, Norway	NTNU	2014
		2.			
		3.			
	22.2	Supplemental Instruction Materials			
		No. Author	Title	Publisher	Year
		1.			

17. List of teaching staff with information specified in Article 5 of the Regulation for obligatory components should own study programs from the first, second and third cycle of studies (Official Gazzete of the Republic of Macedonia" no. 25/2011 and 154/2011)

In implementation of teaching at faculty of Mechanical engineering Skopje there are 59 teachers, 38 of them are full professors, 8 are associate professors and 13 are assistant professors. Here is a list of the teaching staff:

1. Professor Armenski Slave
2. Professor Angusev Koco
3. Professor Bogatinovski Zoran
4. Professor Gocev Jovan
5. Professor Gavriloski Marjan
6. Professor Gecevska Valentina
7. Professor Lazo Dimov
8. Professor Dimitrovski Mile

9. Professor Donev Vanco
10. Professor Dudeski Ljuben
11. Professor Jakimovski Slave
12. Professor Jancevski Janko
13. Professor Kocov Atanas
14. Professor Korunoski Dame
15. Professor Kandikjan Tatjana
16. Professor Kostik Zvonimir
17. Professor Kuzinovski Mikolaj
18. Professor Mickoski Ivan
19. Professor Minovski Robert
20. Professor Malceski Aleksa
21. Professor Polenakovik Radmil
22. Professor Pandilov Zoran
23. Professor Runcev Dobre
24. Professor Stojkovski Valentino
25. Professor Sidorenko Sofija
26. Professor Tuneski Atanasko
27. Professor Trajkovski Laze
28. Professor Tasevski Risto
29. Professor Kosevski Milan
30. Professor Ciconkov Risto
31. Professor Caloska Jasmina
32. Professor Cakmakov Dusan
33. Professor Sarevski Milan
34. Professor Vrtanovski Gligorce
35. Professor Kozinakov Dimitri
36. Professor Tuneski Nikola
37. Professor Petreski Zlatko
38. Professor Simonovski Petar
39. Associate professor Gavriloski Viktor
40. Associate professor Danev Darko
41. Associate professor Gurkov Igor
42. Associate professor Markov Zoran
43. Associate professor Stojmanovski Viktor
44. Associate professor Tasevski Done
45. Associate professor Filkoski Risto
46. Associate professor Mickoski Hristijan
47. Assistant Professor Babunski Darko

48. Assistant Professor Dimitrovski Dame
49. Assistant Professor Lazarevska Ana
50. Assistant Professor Kostik Aleksandar
51. Assistant Professor Mojsovski Filip
52. Assistant Professor Celakoska Emilija
53. Assistant Professor Sarevski Vasko
54. Assistant Professor Zaev Emil
55. Assistant Professor Tomov Mite
56. Assistant Professor Prangoski Bojan
57. Assistant Professor Jovanoski D.Bojan
58. Assistant Professor Ile Mircevski
59. Assistant Professor Kristina Jakimovska

In a realization of the study program Sustainable energy and environment the following teachers take place:

1. Professor Armenski Slave
2. Professor Dimitrovski Mile
3. Professor Chakmakov Dusan
4. Professor Tuneski Atanasko
5. Professor Malcheski Aleksa
6. Professor Stojkovski Valentino
7. Professor Tuneski Nikola
8. Professor Atanas Kochov
9. Associate professor Tashevski Done
10. Associate professor Filkoski Risto
11. Associate professor Markov Zoran
12. Assistant professor Lazarevska Ana
13. Assistant professor Dimitrovski Dame
14. Assistant professor Babunski Darko
15. Assistant professor Zaev Emil
16. Assistant professor Celakoska Emilija
17. Assistant professor Prangoski Bojan

If there is needed, teachers from other organizational units (institute, district) at faculty of Mechanical engineering – Skopje and from other high educative institutions are included in realization of this program in order with the legal procedure for selection of course programs and engaging teachers in the course program.

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**				
1.	Name (First, Last)	Slave Armenski			
2.	Date of birth	04.02.1950			
3.	Scientific degree / Title	Ph.D.			
4.	Title of the scientific degree	Ph.D. in Technical Sciences			
5.	Year and institution of the scientific degree	Education	Year	Institution	
		BSc	1974	Faculty of Mechanical Engineering-Skopje	
		MSc	1980	University of Belgrade	
		PhD	1987	University of Skopje Faculty of Mechanical Engineering	
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty	
		Technical Sciences	Thermal Power Plant	Thermal Energy	
7.	Area, field and area of doctoral degree	Area	Field	Specialty	
		Technical Sciences	Non-Conventional TPP	Thermal Energy	
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area	
		University “Ss Kiril and Metodius”Faculty of Mechanical Engineering Skopje		Full professor	
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Thermo-technical Machines and Devices	PI, MZKI and MHT academic	
		2.	Thermo-technical Machines and Devices	IND, ZDK, HA and PINF professional studies	
		3	Thermal Machines and Devices	PI, TML, HIMV, MSKI, IIM, MV, MHT,	
		4	Fundamental of Renewable Energy	PI, TML, HIMV, MSKI, IIM, MV, MHT,	
		5	Thermal Power Plants	EE	
		6	Non-Conventional Energy sources	EE	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	

		1.	Combined Heat and Power Plant	Full time-TI	
		2.	Geothermal Heat Pump	Full time-TI	
		3	Non-conventional Thermal Plant	Full time-TI and EE	
		4	Modern Power Systems	Full time-EE	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Non-conventional Thermal Plant	TI	
		2.	Rnewable Energy-thermal transformation	TI	
		3.	Modern Power Systems	TI	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S. Armenski	“Estimation of Energy potential of Waste Biomass from Agriculture and Livestock in R. of Macedonia”	“ENERGETICS 2010, Ohrid, 07-09.10.2010, Book 2, pp.665-672
		2.	V. Stojanov, S.Armenski	“Solar and CogenerativePower Plant for Electricity and Heat Energy Production”	“ENERGETICS 2010, Ohrid, 07-09.10.2010, Book 2, pp.691-700
		3.	S. Armenski	Available Biomass Potential for Energy Production in Kochani Valley”	Kochani 27-28 November 2013
		4.	S. Armenski, R.Filkoski	Geothermal Energy-accessible, renewable, available and receptional”	Bulletin “Presing”, No 3, pp. 3-15, June 2011
		5.	S. Armenski	Energy potential of waste wood in the Sout-West planning region of R.Macedonia	“ENERGETICS 2014, Struga, 16-18.10.2014, Book 1, pp.429-440
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S. Armenski, K. Dimitrov, K. Davkova, D. Tasevski and O. Dimitrov	"Municipal solid waste as energy source in R. of Macedonia"	Ministry of Education and Science of R, of Macedonia, Skopje, September 2004
		2.	S. Armenski	Quality Assurance and Accreditation System NetworkQAASNet	TEMPUS project Брошура 2007
	10.3.	Printed books in the last five years (up to 5)			

		No.	Author	Title	Publisher/year
		1.	S. Armenski	Non-conventional Thermal Power Plant”	NIP "Studentski Zbor", pp. 493 стр, Skopje, October 2001
		2.	S. Armenski	Biomass Energy	Alfa-94, pp.241, Skopje April 2009
		3.	S. Armenski	Thermo-technical machines and devices-second edition	Alfa-94, Skopje, 2010, pp.354
		4.	S. Armenski	Solar Energy-thermal transformation	second edition book, Publisher "Jofi-sken"-Skopje, pp. 293, Skopje, May 2012
		5.	S. Armenski	Renewable –*Sustainable* Energy Sources	third edition, book, University “Ss Ciryl and Methodius”, Publisher "Boro-grafica"-Skopje, pp. 390, Skopje, February 2013
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S. Armenski: D.Tasevski	REPLACEMENT OF THE FOSSIL FUEL WITH GRAPE RESIDUES IN KAVADARCI MUNICIPALITY	Norsk Energy”, NGO “Center for climate changes”, Skopje, September 2009
		2.	S.Armenski, K.Popovski	Biomass energy potential in R. of Macedonia	FP7 Grand Agriment No 213417, 2008-2010
		3.	R.Filkoski, D.Tashevski, S.Armenski. Z. Markov	Professional expertise for the inability for hot start, constructive problem of the gas turbine, latent and other non-overhaul defects during installation and commissioning of TE-TO AD Skopje	Skopje, December 2013
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		>100	
	11.2.	Master		21	
	11.3.	Doctoral		2	

12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference / year
		1.			

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Mile Dimitrovski		
2.	Date of birth	27.05.1950		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		PhD.	1988	UKIM, Faculty of Mechanical engineering
		Magister of technical sciences	1986	UKIM, Faculty of Mechanical engineering
		Mechanical engineer	1975	UKIM, Faculty of Mechanical engineering
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Energetic, Mechanical engineering	ICE Engines	IC engines and environment
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Energetic, Mechanical engineering	ICE Engines	IC engines and environment
8.	If employed, state the institution where he/she	Institution		Title and area
		University of St. Cyril and		Professor: Thermal energy

	works and the title and area in which is named		Methodius in Skopje, Faculty of Mechanical engineering	production department
9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Design and tuning of IC engines	TI, MFS
		2.	Fuels and engines	All, MFS
		3.	ICE Engines	EE, MFS
		4.	ICE engines design	TI, MFS
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	Advanced cours od ICE Engines I	EE, MFS
		2.	Advanced couse of ICE Engine II	BZPR, MFS
		3.	IC engines advanced technology 1	TI, MFS
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.		

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski at all.	Nationa strategy for Road Traffic Safety in Rep. Of Macedonia 2009 - 2014	Combustion Institute, Western States, USA, 2008, University of Southern California
		2.	Mile Dimitrovski at all	Second nationa strategy for Road Traffic Safety in Rep. of Maceonia 2015 -2020	Parlament of Rep Of Macedonia
		3.	Mile Dimitrovski	Regulations of Air Pollution fromRoad Transport and Its Implementation in the Macedonia	ME, MTC
		4.	Mile Dimitrovski, Zpran Shapuric,	Decentralization and its inpact on road traffic safety and environment	JEPE
		5.	Mile Dimitrovski,	Directions for connection of Republic of Macedonia to the South East gas streams	

	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski, Vanco Donev, Elenior Nikolov, Dame Dimitrovski	Adjustment of the car park - buses JSP and the use of eco fuels, natural gas, development project	Ministry of education and science, Skopje 2003
		2.	Dame M. Dimitrovski	Using of Biogas for cogenerative systems at sanitary landfill - Drisla Skopje	Project for World Scientific Organization pages 6+52
		3.	Dame Dimitrovski, Sonja Filipovska,	Lowering the influence of using day lights and a mean to reduce the emission from small vehicles	National Agency for Traffic Safety on the roads in 2009, Study
		4.	Dame Dimitrovski,	Emissions and Imissions in the city of Tetovo, traffic development influence on the imissions	National Agency for Traffic Safety on the roads in 2008, Study
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski Dame Dimitrovski	Publication: Agro Energy study possibilities for the use of renewable energy sources in rural areas in the country	Study Agro, Energy Study nr. 008/2009 – Biogas 2009
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski Dame Dimitrovski	Awarded labor original research results published in scientific reference / professional journal with an international editorial board: Ecological benefits of NG buses in Skopje, Awarded article	International Gas conference, Beograd, Serbia, 2007
		2.	Z. Markov, D.Dimitrovski, V.Aleksic	Development of Gas Distribution Network for the city of Kumanovo – Challenges and Solutions,	Proceedings of the Institute of Gas Technology

				International Gas Conference of South Eastern Europe	
		3.	D. Dimitrovski, M. Stojanovski, D. Stojanovska	Virtual pipelines – short cut to natural gas utilization, International Gas Conference of South Eastern Europe	International Gas Conference, Sarajevo 2012
		4.	Dame Dimitrovski	Why biogas from agriculture and livestock, haven't became the basis for rural development in Macedonia	Zemak, Ohrid, 2010
		5.	Done Tashevski, Dame Dimitrovski	Optimization of binary co-generative thermal power plants with SOFC on solid fuel	JETP
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		112	
	11.2.	Master		15	
	11.3.	Doctoral		4	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.	Dame Dimitrovski, Mile Dimitrovski, Elena Kitanovska, Done Tashevski	Pollution from diesel engine with emphasis on pollution in Macedonia	Mechanical engineering – Scientific journal vol 32-1, 2014
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		2.	M. DIMITROVSKI, Z. SAPURIC, D. DIMITROVSKI CA, M. KOCHUBOVSKI.	European Union Regulations of Road Transport Air Pollution and Its Implementation in the FYR Macedonia p.813	Journal of environmental protection and ecology, 2013, vol.3A
		3	Done Tashevski, Dame Dimitrovski	Optimization of binary co-generative thermal power plants with SOFC on solid fuel	Chemical Engineering Transactions, Journal ISSN: 19749791

		4.	Dame Dimitrovski, Mile Dimitrovski, Antonio Jovanovski	Model for calculation of NOx from public transport in the city of Skopje	JEPE, 2014, accepted for publishing, vol 4
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference	year
		1.	D. Dimitrovski, M. Dimitrovski, E. Kitanovska, D. Tashevski:	Pollution from Diesel Engines to Increase of Imported Vehicles in FYR-Macedonia. (IOC - 2nd Award)	1st International Medical Conference "Environment and Public Health" MED ENV 2014, Mamaia, Romania,	12-14 September 2014.
		2.	D. Dimitrovski, M. Dimitrovski, G. Popsimonova, D. Tashevski	Biogas – Overview of the Possibilities for Implementation in the Macedonian Agricultural Sector. (IOC)	16th Symposium on Thermal Science and Engineering of Serbia – SIMTERM 2013, p. 11, Sokobanja, Serbia,	22-25 October, 2013.

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Dushan Chakmakov		
2.	Date of birth	18.02.1959		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences/Computer Science		
5.	Year and institution of the scientific degree	Education	Year	Institution
		B.S. in Mathematics and Informatics	1982	Faculty of Mathematics, University Ss. Cyril and Methodius, Skopje
		M.S. in Computer Science	1988	Faculty of Electrical Engineering and Computer Science, Skopje
		Ph.D. in Computer Science	1992	Faculty of Electrical Engineering and Computer Science, Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Informatics	Programming Languages	Compilers

7.	Area, field and area of doctoral degree		Area	Field	Specialty
			Informatics	Information Systems	Searching in Multimedia Information
8.	If employed, state the institution where he/she works and the title and area in which is named		Institution		Title and area
			Faculty of Mechanical Engineering, Dept. of Mathematics and Informatics, University “Ss. Cyril and Methodius"		Professor
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Data Bases	Production Informatics/Fac. of Mechanical Eng.	
		2.	Probability and Statistics	Industrial Engineering and Management/ Fac. of Mechanical Eng.	
		3.	Programming Languages	Production Informatics/Fac. of Mechanical Eng.	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.	Selected Topics in Informatics	All/ Fac. of Mechanical Eng.	
		2.	System Software	Mechatronics/ Fac. of Mechanical Eng.	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Advanced Computer Programming	All/ Fac. of Mechanical Eng.	
		2.	Artificial Intelligence and	All/ Fac. of Mechanical Eng.	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Celakoska E., Cakmakov D.	Lorentz Link Problem and Solutions	*Proceedings of the Fourth Int. Scientific Conference FMNS, Blagoevgrad,* Vol.1, 2011, 16-21.
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Chakmakov D.	Probability and Statistics for Engineers	University Ss. Cyril and Methodius, Skopje, (in Print)
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year

		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate	/		
	11.2.	Master	/		
	11.3.	Doctoral	/		
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference / year
		1.			

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Atanasko Tuneski		
2.	Date of birth	22.01.1965		
3.	Scientific degree / Title	Ph.D./ Professor		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D	1997	Faculty of Mechanical Engineering - Skopje
		M.Sc	1993	Faculty of Mechanical Engineering - Skopje
		B.Sc	1989	Faculty of Mechanical Engineering - Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Technical Sciences	Mechanical Engineering	Control Systems
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Technical Sciences	Mechanical Engineering	Control Systems
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area
		Faculty of Mechanical Engineering –Skopje		Full Professor, Automation
9.	List of courses that the teacher is lecturing separately for first, second and third cycle			

	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Systems and Control	All programs at the Faculty of Mechanical Engineering – Skopje
		2.	Optimal Energetic Systems	Energetics and Ecology/ Faculty of Mechanical Engineering – Skopje
		3.	Environmental Monitoring and Control	Environmental and Resources Engineering Studies
		4.	Automatic Control Systems	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
		5.	Digital Control Systems	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	Control of Dynamic Systems	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
		2.	Environmental Systems Analysis	Environmental and Resources Engineering Studies
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.	Advanced Control of Dynamic Systems	Mechanical engineering/Faculty of Mechanical Engineering
		2.	Advanced Computer Control of Systems and Processes	Mechanical engineering/Faculty of Mechanical Engineering
10.	Selected work in the past five years			
	10.1.	Relevant scientific printed paper (up to 5)		
		No.	Author	Title	Publisher/year
		1.	Babunski D, Tuneski A., Zaev E.	Simulation of load rejection on a nonlinear Hydro Power Plant model with mixed mode nonlinear controller	IEEE Conference on Embedded Computing (MECO), June 2012, Bar, Monte Negro
		2.	A.Tuneski et al.	Development of an Environmental and Resources Engineering Learning	SEFI 42nd Annual Conference, September 2014, Birmingham, United Kingdom
		3.	A.Tuneski et al.	Environmental engineering curricula development	SEFI 41st Annual Conference, September 2013, Leuven, Belgium

		4.	Emil Zaev, Gerhard Rath, Atanasko Tuneski et al.	HPP Simulator for Real-Time Simulation and SCADA Software Testing	6th Annual SEE Conference: Infusing Research and Knowledge in South-East Europe, September, 2011, Thessaloniki, Greece
		5.	A.Tuneski et al.	Development of an Environmental and Resources Engineering Education Framework	SEFI 40th Annual Conference, September 2012, Thessaloniki, Greece
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A.Tuneski (Coordinator)	Development of Environmental and Resources Engineering Learning	EU Directorate for Education and Science, TEMPUS IV
		2.	A.Tuneski (Coordinator)	Monitoring and Improving Rivers in Vardar/Axios Watershed	NATO Science for Peace Project, 2006-2010, SfP 981877
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A. Tuneski, E. Caporali	Towards a New Curriculum: The DEREC Experience	Firenze University Press, 2009
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		more than 20	
	11.2.	Master		3 (three)	
	11.3.	Doctoral		2 (two)	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.	A.Tuneski et al.	Design of Robust Control Law for Hydroturbine and SCADA Simulation	Journal of Energetics, Journal of Association of Energy Sector, No.2, year XIII, March 2011, ISSN 0354-8651, UDC: 621.224.011:62-5, pp.85-89.
		2.	A.Tuneski	Adaptive Control of Multiple Robots	ROBOMAC publication, published by IEEE Branch

				Manipulation on Dynamic Environment	Macedonia and BEST – Board of Students of Technology, 2009	
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	Year
		1.	Babunski D, Tuneski A., Zaev E.	Simulation of load rejection on a nonlinear Hydro Power Plant model with mixed mode nonlinear controller	IEEE Conference on Embedded Computing (MECO), June 2012,Monte Negro	2012
		2.	A.Tuneski et al.	Development of an Environmental and Resources Engineering Learning	SEFI 42nd Annual Conference, September 2014, Birmingham, United Kingdom	2014
		3.	A.Tuneski et al.	Environmental engineering curricula development	SEFI 41st Annual Conference, September 2013, Leuven, Belgium	2013
		4.	Emil Zaev, Gerhard Rath, Atanasko Tuneski et al.	HPP Simulator for Real-Time Simulation and SCADA Software Testing	6th Annual SEE Conference: Infusing Research and Knowledge in South-East Europe, 2011, Thessaloniki, Greece	2011

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Aleksa Malcheski		
2.	Date of birth	12.03.1964		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in mathematical sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		B.S. in Mathematics	1988	Faculty of Science, University Ss. Cyril and Methodius,

				Skopje
		M.Sc. in Theoretical Mathematics	1996	Faculty of Science, University Ss. Cyril and Methodius, Skopje
		Ph.D. in Theoretical Mathematics	2002	Faculty of Science, University of Novi Sad, Novi Sad, Serbia
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Mathematics	Complex Analysis	Bounded analytic functions
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Mathematics	Functional analysis	Banal spaces, n-normed spaces
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution	Title and area	
		Faculty of Mechanical Engineering, Dept. of Mathematics and Informatics, University “Ss. Cyril and Methodius"	Full Professor, Mathematics	

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Mathematics 1	All on MFS
		2.	Mathematics 2	All on MFS
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	Numerical mathematics	All on MFS
		2.	Methods of optimization	All on MFS
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.	/	/

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Aleksa Malcheski, Vesna Manova Erakovik	A characterization of n-semi norm	Mathematica Balkanica,New series, Vol.25,2011, Fasc.4, Bulgaria
		2.	Aleksa Malcheski, Vesna Manova Erakovik	Some 2-subspaces of 2-space	Mathematicki Bilten, Математички Билтен, 35 (LXI),

					Македонија, 2011
		3.	Aleksa Malcheski, Vesna Manova Erakovik	An extend of the type of Hanh-Banach for skew-symmetric linear forms	Математички Билтен, 35 (LXI), Македонија, 2011
		4.	Aleksa Malcheski	Hahn Banach Theorem for branch 2-subspaces	Proceedings of the 5 congres of mathmaticinas of Macedonia, 23-27.09.2014
		5.	Aleksa Malcheski, Vesna Manova Erakovik	Hahn Banach Theorem for cyclic 2-subspaces	Proceedings of the 5 congres of mathmaticinas of Macedonia, 23-27.09.2014
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Aleksa Malcheski, Donco Dimoski, Gjorgji Markoski, Jasmina Markoska, Marija Mihova	Students' Institute of Mathematics and Informatics	2013, (MANU)
		2.	Vesna Manova Erakovik, Aleksa Malcheski and other	**"**The boundary values of the analytic functions and distributions and approximations in the sense of distributions"	2006-2009, Institute of mathematics, Faculty of Natural sciences and Mathematics
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Aleksa Malcehski and other	Competitions in mathematics in primary education 2006-2013	SMM, 2014
		2.	Aleksa Malcheski, Risto Malcheski, Vesna Manova Erakovic,Gjorgji Markoski	Sigma-Mails, Preparatory tasks for mathematical competitions	SMM, 2012
		3.	Aleksa Malcheski, Risto Malcheski, Vesna Manova Erakovic, Gjorgji Markoski	Sigma-Mails, Box competition tasks 1006-1260	SMM, 2012
		4.	Aleksa Malcheski, Risto Malcheski, Vesna Manova Erakovic, Gjorgji Markoski	Sigma-Mails, Box competition tasks, 1-192	SMM, 2012
		5.	Aleksa Malcheski	Sigma-Mails, regional competitions in mathematics in secondary education,	SMM, 2012

				1978-2012	
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		/	
	11.2.	Master		1	
	11.3.	Doctoral		/	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference	year
		1.				

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Valentino Stojkovski		
2.	Date of birth	14.10.1964		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D in Mechanical Engineering	2001	Faculty of Mechanical engineering - Skopje
		M. Sc. in Mechanical Engineering	1995	Faculty of Mechanical engineering - Skopje
		B. Sc. in Mechanical Engineering	1989	Faculty of Mechanical engineering - Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Technical-technological sciences	Mechanical	Fluid mechanic and fluid flow systems

7.	Area, field and area of doctoral degree		Area	Field	Specialty
			Technical-technological sciences	Mechanical	Fluid mechanic and fluid flow systems
8.	If employed, state the institution where he/she works and the title and area in which is named		Institution		Title and area
			University of Ss Cyril and Methodius, faculty of Mechanical engineering		Professor, Fluid flow and hydraulic machines
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Fluid mechanics	PI,HIMV,MSKI,IIM,MHT,AUS/ FME	
		2.	Fluid dynamics and CFD	HIMV / FME	
		3.	Fluid flow measurement	HIMV,AUS / FME	
		4.	Gas systems	EE/FME	
		5.	Design of hydraulic machines and systems	HIMV/FME	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.	Modeling and simulation in automation and fluid engineering	AFI /FME	
		2.	Measuring, monitoring and data base	AFI / FME	
		3.	Selected chapters of fluid mechanics	AFI /FME	
		4.	Fluid conveying	AFI/FME	
		5.	Pumps and pumps stations	AFI/FME	
		6.	Engineering experimentation	EE/FME	
		7.	Design of hydro power plant	EE/FME	
		8.	Protection and safety in hydropower plants and systems	BZR/FME	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Experimental research in fluid mechanics and hydraulic systems	HIA / FME	
		2.	Modeling and simulation in fluid dynamic	HIA / FME	
		3.	Advance topics of fluid mechanics	HIA / FME	
		4.	Norms for protection of environmental	HIA / FME	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Valentino Stojkovski, Zvonimir Kostic	Empirilical correlation for prediction of the elutriation	Thermal Science, Vol.7, No.2, pp.43-

				rate constant	58, 2003
		2.	V.Stojkovski, Z.Kostic, A.Nospal	Dependence of the total entrainment flux upon the apparent and the total fluidization number	Thermal Science, Vol.4, No.1, pp.65-73, 2008
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Noshpal A., Stojkovski V., Markov Z.	Application of CAD and CAX technologies in electrical technique processes in energy and ecology	Ministry of education and science of Republic Macedonia 2006-2009
		2.	M. Kosevski (Project coord.), V.Stojkovski et al.	Numerical Simulation Program in Mechanical Engineering,	Tempus CARDS JEP-19017, 2006-2009
		3.	I.Petrovski, R.Filkovski, A.Nospal, V.Stojkovski et at.	Research and optimization of thermal processes in thermo energetic equipment with numerical analyses	Ministry of education and science of Republic Macedonia 2006-2009
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	R.Filkovski, I.Petrovski, A.Nospal, V.Stojkovski	Energy eficiencyand energy saving in industry and services	14 THERMAL SYMPOSIUM SERBIA, 2009
		2.	V.Stojkovski, Z.Kostic, A.Nospal, D.Tanurkov:	Criteria for assessing the feasibility of small hydro power plant	INTERNATIONAL CONFERENCE: ENERGY,2008
		3.	V.Fustic, V.Stojkovski et.al.	EXPERTS' ANALYSIS OF THE EQUIPMENT IN THE SMALL HYDRO POWER PLANTS IN THE "TRANSFER" PHASE OF THE ROT PROJECT	International council on large electric systems Macedonian national committee-Conference 2013
		4.	R.Filkovski, F.Stojkovski, V.Stojkovski	A CFD study of a solar chimney power plant operation	6th International conference on sustainable energy & environmental protection SEEP 2013, Maribor, Slovenia
		5.	P.Popovski, V.Stojkovski, K.Najdenkovski	Method for measuring the guaranteed energy	Macedonian energy association

				performance of small hydro power plant	International symposium Energetics 2014
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		37	
	11.2.	Master		4	
	11.3.	Doctoral		/	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference	year
		1.				

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Nikola Tuneski		
2.	Date of birth	16.07.1971		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in mathematical sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D. in mathematics	1994	University of Belgrade, Serbia
		M. Sc. in mathematics	1997	UKIM, Macedonia
		B. Sc. In Engineering	1999	UKIM, Macedonia
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Mathematics	Probability	Random processes

<table>
<tr><td rowspan="2">7.</td><td rowspan="2">Area, field and area of doctoral degree</td><td>Area</td><td>Field</td><td>Specialty</td></tr>
<tr><td>Mathematics</td><td>Complex analysis</td><td>Geometric function theory</td></tr>
<tr><td rowspan="2">8.</td><td rowspan="2">If employed, state the institution where he/she works and the title and area in which is named</td><td colspan="2">Institution</td><td>Title and area</td></tr>
<tr><td colspan="2">Faculty of Mechanical Engineering
Ss. Cyril and Methodius University in Skopje</td><td>Full Professor, Mathematics and informatics</td></tr>
<tr><td rowspan="13">9.</td><td colspan="5">List of courses that the teacher is lecturing separately for first, second and third cycle</td></tr>
<tr><td>9.1.</td><td colspan="4">List of courses that the teacher is lecturing in the first cycle</td></tr>
<tr><td></td><td>No.</td><td>Course</td><td colspan="2">Study program/institution</td></tr>
<tr><td></td><td>1.</td><td>Mathematics 1</td><td colspan="2">all on MFS</td></tr>
<tr><td></td><td>2.</td><td>Engineering Mathematics</td><td colspan="2">all on MFS</td></tr>
<tr><td>9.2.</td><td colspan="4">List of courses that the teacher is lecturing in the second cycle</td></tr>
<tr><td></td><td>No.</td><td>Course</td><td colspan="2">Study program/institution</td></tr>
<tr><td></td><td>1.</td><td>Probability and Statistics</td><td colspan="2">all on MFS</td></tr>
<tr><td></td><td>2.</td><td>Complex Analysis for Engineers</td><td colspan="2">all on MFS</td></tr>
<tr><td>9.3.</td><td colspan="4">List of courses that the teacher is lecturing in the third cycle</td></tr>
<tr><td></td><td>No.</td><td>Course</td><td colspan="2">Study program/institution</td></tr>
<tr><td></td><td>1.</td><td>Theory and Application of Differential Subordinations</td><td colspan="2">Mathematical sciences and application</td></tr>
<tr><td></td><td>2.</td><td>Theory of Univalent Functions and its Application</td><td colspan="2">Mathematical sciences and application</td></tr>
<tr><td rowspan="5">10.</td><td colspan="5">Selected work in the past five years</td></tr>
<tr><td>10.1.</td><td colspan="4">Relevant scientific printed paper (up to 5)</td></tr>
<tr><td></td><td>No.</td><td>Author</td><td>Title</td><td>Publisher/year</td></tr>
<tr><td></td><td>1.</td><td>E. Aliaga
N. Tuneski</td><td>Some connections between class U and α-convex functions, Abstract and Applied Analysis, Volume 2014, Article ID 692327, 4 pages.</td><td>Hindawi Publishing Corporation
2014
(2013 IMPACT FACTOR 1.102)</td></tr>
<tr><td></td><td>2.</td><td>N. Tuneski, M. Darus</td><td>On functions that are Janowski starlike with respect to N–symmetric points, Hacettepe Journal of Mathematics and Statistics, Vol. 41 (2) (2012), 271 – 275.</td><td>Hacettepe University
2012
(2010 IMPACT FACTOR 0.385)</td></tr>
<tr><td></td><td>3.</td><td>Obradovic M., Ponnusamy S., Tuneski N.</td><td>Radius of univalence of certain combination of univalent and analytic functions, Bulletin of the Malaysian Mathematical Sciences Society, (2) 35(2) (2012), 325–334.</td><td>Malaysian Mathematical Sciences Society
2012
(2010 IMPACT FACTOR 0.696)</td></tr>
</table>

		4.	Tuneski N., Obradovic M.	Some properties of certain expression of analytic functions, *Computers and Mathematics with Applications*, 62 (2011), 3438–3445.	Elsevier 2011 (IMPACT FACTOR 2.069)
		5.	Irmak H., Bulboaca T., Tuneski N.	Certain relations between α–convex type functions and Bazilevič type functions, *Applied Mathematics Letters*, Vol. 24 (12) (2011), 2010–2014.	Elsevier 2011 (2010 IMPACT FACTOR 1.155)
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/ year
		1.			
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/ year
		1.	Tuneski, N., Jolevska-Tuneska B.	Differential calculus	UKIM, 2011
		2.	Tuneski, N., Jolevska-Tuneska B.	Integral calculus	UKIM, 2011
		3.	Tuneski, N., Georgieva-Celakoska E.	Introduction to MATLAB	the authors, 2010
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/ year
		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		/	
	11.2.	Master		1	
	11.3.	Doctoral		2 students in progress	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/ year
		1.	Obradovic M., Ponnusamy S., Tuneski N.	Radius of univalence of certain combination of univalent and analytic functions, *Bulletin of the Malaysian Mathematical Sciences Society*, (2) 35(2) (2012), 325–334. (2010 IMPACT FACTOR 0.696) http://www.emis.de/journals/BMMSS/vol35_2.htm	2012
		2.	Irmak H.,	Certain relations between α–convex type functions	2011

			Bulboaca T., Tuneski N.	and Bazilevič type functions, *Applied Mathematics Letters*, Vol. 24 (12) (2011), 2010–2014. (2010 IMPACT FACTOR 1.155) http://www.sciencedirect.com/science/journal/08939659/24	
		3.	Tuneski N., Obradovic M.	Some properties of certain expression of analytic functions, *Computers and Mathematics with Applications*, 62 9 (2011), 3438–3445. (IMPACT FACTOR 2.069) http://www.sciencedirect.com/science/journal/08981221/62/9	2011
		4.	H. M. Srivastava, N. Tuneski, Emilija Georgieva–Celakoska	Some Distortion and Other Properties Associated with a Family of the *n*–Fold Symmetric Koebe Type Functions, *Australian Journal of Mathematical Analysis and Applications*, Vol. 9, Issue 2, Article 1, (2012) 1-17. http://ajmaa.org/Volumes/Volume%209%20Issue%202%202012.php	2012
		5.	Tuneski, N.	On a Class of Functions Defined by Takahashi and Nunokawa, *Mathematica Balkanica*, Vol. 25 (1–2) (2011), 203–209. http://www.mathbalkanica.info/toc/cont2512.pdf	2011
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/ year
		1.	E. Aliaga, N. Tuneski	Some connections between class U and α-convex functions, *Abstract and Applied Analysis*, Volume 2014, Article ID 692327, 4 pages, http://dx.doi.org/10.1155/2014/692327. (2013 IMPACT FACTOR 1.102) http://www.hindawi.com/journals/aaa/2014/692327/	2014
		2.	N. Tuneski, M. Darus	On functions that are Janowski starlike with respect to N–symmetric points, *Hacettepe Journal of Mathematics and Statistics*, Vol. 41 (2) (2012), 271 – 275. (2010 IMPACT FACTOR 0.385) http://www.hjms.hacettepe.edu.tr/issues/vol41_2.html	2012
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International year

					meeting/conference	
		1.	N. Tuneski	Functions of bounded turning	International Short Joint Research Workshop “Some inequalities concerned with the geometric function theory”, The Research Institute for Mathematical Sciences, Kyoto University, Kyoto, Japan, May 22 – 24, 2013.	2013
		2.	N. Tuneski, M. Darus, E. Gelova	Simple criteria for bounded turning of an analytic function.	“Geometric Function Theory and Applications’2012”, Ohrid, R. Macedonia, August 27 – 31, 2012.	2012
		3	N. Tuneski	From inequalities to subordinations and back	13th Serbian Mathematical Congress, Vrnjačka Banja, May 22 - 25, 2014.	2014

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Atanas Kochov		
2.	Date of birth	March 8, 1966		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D in Mechanical Engineering	2001	Faculty of Mechanical engineering - Skopje
		M. Sc. in Mechanical Engineering	1994	Faculty of Mechanical engineering - Skopje
		B. Sc. in Mechanical Engineering	1990	Faculty of Mechanical engineering - Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Technical sciences	Mechanical engineering	FEA in metalforming processes
7.	Area, field and area of	Area	Field	Specialty

	doctoral degree		Technical sciences	Mechcanical engineering	Composite materials
8.	If employed, state the institution where he/she works and the title and area in which is named		Institution		Title and area
			UKIM, Faculty of Mechanical Engineering		Full time professor Mechanical engineering
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Management of technology	Industrial engineering and management	
		2.	Computer aided engineering	Production engineering	
		3.	Production processes	Mechanical engineering	
		4.	Technology of rapid prototyping	Mechanical engineering	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.	Management of technology	Industrial engineering and management	
		2.	Sustainable development	Product life cycle management	
		3.	Cleaner production	Metrology	
		4.	Modeling and simulation of plastic injection molding	Production engineering	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Sustainable development	Industrial engineering and management	
		2.	Managment of Technology innovation	Industrial engineering and management	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A.Kochov:	"Scientific and Technological Innovations for Greater Economic Revitalization (S-TIGER)",	Fulbright Academy, Cambridge University, Boston, USA, February, 2008.
		2.	A.Kochov:	"Macedonian SME's - achivements and future activites: Competitvenss of SME through implementation of CP tehnologies",	pg. 89, Joint Actions on Climate Change Conference, Aalborg, Danmark June 9-11, 2009.
		3.	A.Kochov:	"Management of technology - Low Carbon techniques for agro food sector"	European Roundtable for Sustainable Consumption and Production, Delft, Netherland, October 28-31, 2010.
		4.	A.Kochov, B.Dunjic:	Low-Carbon production	Regional Resource

				concept in managing SME in WBC,	Efficient & Cleaner Production Net meeting of NVPCs and NCPPs from the European and Central Asian countries, 4th Nevsky International Ecological Congress, May 2011; St. Petersburg, Russia.
		5.	A.Kochov	Sustainable development supported by low carbon technologies in agro business sector	ERSCP conference, Portoroz, Slovenia, October 2014
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A. Kochov, at all. UNIDO	Cleaner production technologies	2007-2010
		2.	A. Kochov, at all UNIDO	Resource efficiency and cleaner production	2010-2012
		3.	A. Kochov, at all UNIDO	Low carbon technologies	2011-2014
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A.Kochov:	"CDM projects implementation in SME in Macedonia",	Regional Conference on financing energy efficiency & RES project, energy week, Skopje, Macedonia, 2009.
		2.	A.Kochov:	"Management of technology - Low Carbon techniques for agro food sector",	European Roundtable for Sustainable Consumption and Production, Delft, Netherland, October 28-31, 2010.
		3.	A.Kochov:	Sustainable industrial development in the context of Low Carbon Society concept,	UNIDO-PREPARE conference: *"SCP: How to make it possible"* Kaunas, Lithuania, September 2011.

		4.	A.Kochov:	"Green manufacturing driving low carbon, resource efficient and clean industrialization in developing and transition economies"	2nd Global Network Conference on Resource Efficient and Cleaner Production (RECP – 2011), UN – Gigiri, Nairobi, Kenya, 17-19 October 2011
		5.	A.Kochov	"Management of technology - Low Carbon techniques for agro food sector in WBC"	3rd Global Network Conference on Resource Efficient and Cleaner Production (Swiss, Luzern, October 2013)

11.	Supervision (mentorship) of undergraduate, master and doctoral studies students		
	11.1.	Undergraduate	Over 20
	11.2.	Master	Over 10
	11.3.	Doctoral	Over 5

12.	For mentors of doctoral thesis, selected work for the last four / five years					
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	year
		1.				

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Done Tashevski		
2.	Date of birth	04.08.1962		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		PhD in Technical Sciences	2004	UKIM Skopje Macedonia Faculty of Mechanical Engineering
		MSc Technical Sciences	1994	UKIM Skopje Macedonia Faculty of Mechanical Engineering

		BSc Technical Sciences – Mechanical eng.	1985	UKIM Skopje Macedonia Faculty of Mechanical Engineering	
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty	
		Mechanical engineering	Energetic	Energy and ecology	
7.	Area, field and area of doctoral degree	Area	Field	Specialty	
		Mechanical engineering	Energetic	Fuel cells	
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area	
		Faculty of Mechanical Engineering Skopje, University Ss. Cyril and Methodius in Skopje		Professor / mechanical engineering- thermal engineering	

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Steam and gas turbines	TI/MFS
		2.	Exploitation and maintenance of power plants and systems	TI/MFS
		3.	Energy efficiency	EE/MFS
		4.	Energy and ecology	EE/MFS
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	General ecology	EE/MFS
		2.	Modeling of processes of energy conversion	TI/MFS
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.	Energy efficiency	TI/MFS
		2.	Modern power plants	TI/MFS

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	D. Tashevski, R. Filkoski, D. Dimitrovski, I. Shesho	Analysis of Parameters Affecting the Efficiency Optimization of Binary SOFC Co-generation Power Plants.	International Journal of Mechanical Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 10, pp. 180-190, India, 2014 (JIF 7,5377)
		2.	D. Tashevski, R.	Optimization of Binary	International Journal of Mechanical

			Filkoski, I. Shesho	Cogenerative Thermal Power Plants with Solid Oxide Fuel Cells on Natural Gas.	Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 1, pp. 122-131, India, 2014 (JIF 5,77)
		3.	I. Shesho, D. Tashevski:	Simulation Application for Optimization of Solar Collector Array.	International Journal of Engineering Research and Applications (IJERA), Volume 4, Issue 1, pp. 10-19, (ISSN: 2248-9622), India, 2014 (JIF 1,69)
		4.	D. Tashevski, D. Dimitrovski	Optimization of Binary Co-generative Thermal Power Plants with SOFC on Solid Fuel.	Chemical engineering transaction, vol. 34, pp. 31-36, (DOI: 10.3303/ CET1334006), Italy, 2013 (SJR Thomson Reuters 0,26)
		5.	D. Tashevski, I. Shesho	Three-generation Power Plant with High-temperature Fuel Cells for Complex Building.	International Journal of Engineering Research and Development, (e-ISSN: 2278-067X, p-ISSN: 2278-800X), Volume 6, Issue 5, pp. 46-52, India, 2013 (JIF 1,131)
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S. Armenski D. Tashevski L. Karakasheva	Production of briquettes and pellets from agricultural waste – Agro Energy	CeProSARD Skopje, Macedonia /2011-2012
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S. Armenski, D. Tashevski	Thermal power plants – exercise, 300 p.,	Alfa 99 Skopje, ISBN 978-9998-936-36-4, Macedonia, 2010.
		2.	S. Armenski, D. Tashevski, L. Karakasheva	Production of briquets and pellets – handbook. 85 p.	CeProSARD, ISBN 978-608-65330-6-9, Skopje, Macedonia, 2012.
		3.	D. Tashevski:	Maintenance and exploatation of energy power plants and systems (1st publication), 298 p.,	UKIM in Skopje E-publication and digital libraries, Skopje, Macedonia, 2014 (No.03-187/2 from 11.2.2014).
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	R. Filkoski D. Tashevski, S. Armenski, Z. Markov:	Professional expertise for the inability of hot start, constructive problem of gas turbine, and other uncorrected	MFS Skopje / December 2013

				defects in installation and commissioning of TE-TO AD, No. 07-3270/5.	
		2.	D. Tashevski, R. Filkoski, D. Dimitrovski, I. Shesho:	Technical report of explosion od hot water boiler on LPG located in „Cevahir residence and mall project“ – Skopje for Cevahir Gurup Istanbul, Turkie, subsidiary in R. Macedonia, No. 07-1983/4,	MFS Skopje / December 2013
		3.	D. Tashevski	Energy audit report of JOUDG „Angel Shajce“ object „Buba Mara“, No. 07-235/5,	MFS Skopje / January 2013
		4.	D. Tashevski, I. Shesho:	Head project – mechanical installation, termotechnical installation an facilities for resindetial-bussines object st. M. Apsotolski, tech. No 226/2012,	Bauer Skopje, / May 2012
		5.	D. Tashevski	Energy audit of elementary school and kinder gardens under the authority of the local government, municipality G. Petrov and M.A. Chento (5 kinder gardens and 1 elementary school),	MACEF Skopje / January 2001
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate	52 mentorship of undergraduate students		
	11.2.	Master	- 2 mentorship of master students 1. Sashe Panevski - Use of energy management systems in Republic of Macedonia 2. Arben Veliu – The potential for energy saving in buildings and use of renewable energy sources in urban area - Seven students in progress		
	11.3.	Doctoral	One student in progress		
12.	For mentors of doctoral thesis, selected work for the last four / five years				

	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.	D. Tashevski, R. Filkoski, D. Dimitrovski, I. Shesho	Analysis of Parameters Affecting the Efficiency Optimization of Binary SOFC Co-generation Power Plants.	International Journal of Mechanical Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 10, pp. 180-190, India, 2014 (JIF 7,5377)
		2.	D. Tashevski, R. Filkoski, I. Shesho	Optimization of Binary Cogenerative Thermal Power Plants with Solid Oxide Fuel Cells on Natural Gas.	International Journal of Mechanical Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 1, pp. 122-131, India, 2014 (JIF 5,77)
		3.	I. Shesho, D. Tashevski:	Simulation Application for Optimization of Solar Collector Array.	International Journal of Engineering Research and Applications (IJERA), Volume 4, Issue 1, pp. 10-19, (ISSN: 2248-9622), India, 2014 (JIF 1,69)
		4.	D. Tashevski, D. Dimitrovski	Optimization of Binary Co-generative Thermal Power Plants with SOFC on Solid Fuel.	Chemical engineering transaction, vol. 34, pp. 31-36, (DOI: 10.3303/ CET1334006), Italy, 2013 (SJR Thomson Reuters 0,26)
		5.	D. Tashevski, I. Shesho	Three-generation Power Plant with High-temperature Fuel Cells for Complex Building.	International Journal of Engineering Research and Development, (e-ISSN: 2278-067X, p-ISSN: 2278-800X), Volume 6, Issue 5, pp. 46-52, India, 2013 (JIF 1,131)
		6.	D. Tashevski, D. Dimitrovski, Z. Markov, I. Shesho:	Energy and Ecology Benefits of Independent SOFC/Gas Turbine Co-generation Power Plant on Natural Gas.	1st Internatinal U.O.C. – B.E.N.A. – Conference "The Sustainability of Pharmaceutical, Medical and Ecological Education and Research – SPHAMEER – 2013", proceedings book p. 6, Constanca, Romania,
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.	D. Tashevski, R. Filkoski, D. Dimitrovski, I. Shesho	Analysis of Parameters Affecting the Efficiency Optimization of Binary SOFC Co-generation Power Plants.	International Journal of Mechanical Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 10, pp. 180-190, India, 2014 (JIF 7,5377)
		2.	D. Tashevski, R. Filkoski,	Optimization of Binary Cogenerative Thermal	International Journal of Mechanical Engineering and Technology

			I. Shesho	Power Plants with Solid Oxide Fuel Cells on Natural Gas.	(IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 1, pp. 122-131, India, 2014 (JIF 5,77)	
		3.	I. Shesho, D. Tashevski:	Simulation Application for Optimization of Solar Collector Array.	International Journal of Engineering Research and Applications (IJERA), Volume 4, Issue 1, pp. 10-19, (ISSN: 2248-9622), India, 2014 (JIF 1,69)	
		4.	D. Tashevski, D. Dimitrovski	Optimization of Binary Co-generative Thermal Power Plants with SOFC on Solid Fuel.	Chemical engineering transaction, vol. 34, pp. 31-36, (DOI: 10.3303/ CET1334006), Italy, 2013 (SJR Thomson Reuters 0,26)	
		5.	D. Tashevski, I. Shesho	Three-generation Power Plant with High-temperature Fuel Cells for Complex Building.	International Journal of Engineering Research and Development, (e-ISSN: 2278-067X, p-ISSN: 2278-800X), Volume 6, Issue 5, pp. 46-52, India, 2013 (JIF 1,131)	
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	year
		1.	D. Dimitrovski, M. Dimitrovski, E. Kitanovska, D. Tashevski:	Pollution from Diesel Engines do to Increase of Imported Vehicles in FYR-Macedonia. (IOC - 2nd Award)	1st International Medical Conference "Environment and Public Health" MED ENV 2014, Mamaia, Romania,	12-14 September 2014.
		2.	D. Dimitrovski, M. Dimitrovski, G. Popsimonova, D. Tashevski	Biogas – Overview of the Possibilities for Implementation in the Macedonian Agricultural Sector. (IOC)	16th Symposium on Thermal Science and Engineering of Serbia – SIMTERM 2013, p. 11, Sokobanja, Serbia,	22-25 October, 2013.
		3.	D. Dimitrovski, K. Belcheska, D. Tashevski, M. Kocubovsk	Possible Scenarios for Achiving the Goal 20/20/20 in FYR-Macedonia.	1st Internatinal U.O.C. – B.E.N.A. – Conference "The Sustainability of Pharmaceutical, Medical and Ecological Education and Research – SPHAMEER – 2013", p. 6, Constanca, Romania. (IOC)	20-23 June, 2013.
		4.	D. Tashevski,	Energy and Ecology	1st Internatinal U.O.C. –	20-23

			D. Dimitrovski, Z. Markov, I. Shesho:	Benefits of Independent SOFC/Gas Turbine Co-generation Power Plant on Natural Gas.	B.E.N.A. – Conference "The Sustainability of Pharmaceutical, Medical and Ecological Education and Research – SPHAMEER – 2013", p. 6, Constanca, Romania,	June, 2013. (IOC)
		5	D. Dimitrovski, M. Dimevska, D. Tashevski:	Strategic connection of Republic of Macedonia to the European natural gas streams. (IOC)	International gas conference of South Eastern Europe, Sarajevo, Bosnia and Herzegovina,	2012

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**				
1.	Name (First, Last)	Risto Filkoski			
2.	Date of birth	29.04.2964			
3.	Scientific degree / Title	Ph.D.			
4.	Title of the scientific degree	Ph.D. in Technical Sciences			
5.	Year and institution of the scientific degree	Education	Year	Institution	
		BSc (Dipl. Eng.)	1989	UKIM, Faculty of Mech. Eng., Skopje	
		MSc	1997	UKIM, Faculty of Mech. Eng., Skopje	
		PhD	2004	UKIM, Faculty of Mech. Eng., Skopje	
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty	
		Technical sciences	Power engineering	Power and process engineering	
7.	Area, field and area of doctoral degree	Area	Field	Specialty	
		Technical sciences	Power engineering	Mathematical modelling and simulation of energy processes	
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area	
		University "Sts Cyril and Methodius", Faculty of Mechanical Engineering		Assoc. professor	
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Boiler plants	Thermal engineering	

		2.	Process technique	Thermal engineering	
		3.	Thermodynamics	Power engineering and envitonment	
		4.	Energy management and resources	Power engineering and envitonment	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.	Modelling of energy conversion processes	Thermal engineering	
		2.	Steam generators - selected chapters	Thermal engineering	
		3.	Fuels use and environment	Power engineering and envitonment	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Selected chapters from modelling of energy conversion processes	Thermal engineering	
		2.	Modelling of energy conversion processes and environmental impact	Power engineering and envitonment	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	R. V.Filkoski, L. Joleska Bureska, I. J. Petrovski	Assessment of the Impact of Under-Fire Air Introduction on the Pulverised Coal Combustion Efficiency	Chemical Eng. Transactions, AIDIC Publ., 2013, 34, 25-30, DOI: 10.3303/CET1334005
		2.	Mikulcic H., Vujanovic M., Markovska N., Filkoski R. V., Ban M., Duic N.	CO_2 Emission Reduction in the Cement Industry	Chem. Eng. Trans., AIDIC Publ., 2013, Vol. 35, p.703-708, ISBN 978-88-95608-26-6; ISSN 1974-9791
		3.	V. Strezov, E. Popovic, R. V. Filkoski, P. Shah, T. Evans	Assessment of the Thermal Processing Behaviour of Tobacco Waste	Energy and Fuels, ACS Publications, 2012, 26, p.5930-5935
		4.	R. V. Filkoski	Pulverised-Coal Combustion with Staged Air Introduction: CFD Analysis with Different Radiation Methods	The Open Thermodynamics Journal, Vol. 4(2010), Bentham Science Publ., 2010, p. 2-12.
		5.	R. V. Filkoski	Radiation Heat	Archives of

				Transfer Modelling and CFD Analysis of Pulverised-Coal Combustion with Staged Air Introduction	Thermodynamics, Vol. 30(2009), No. 4, IFFM Publishers, 2009, p. 97-118.
		6.	R. V. Filkoski, S. V. Belošević, I. J. Petrovski, S. N. Oka, M. A. Sijerčić	CFD Technique as a Tool for Description of the Phenomena Occuring in Pulverised Coal Boilers	Proc. ImechE Part A: Journal of Power and Energy, Vol. 221 (3), 2007, p. 399-409.
		7.	R. V. Filkoski, I. J. Petrovski, P. Karaś	Optimisation of Pulverised Coal Combustion by Means of CFD/CTA Modelling	(An International Journal of) Thermal Science, Vol. 10 **(3)**, 2006, p. 161-179.
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	R. V. Filkoski	Modelling of energy conversion processes	Tempus CARDS JEP-19017 "Numerical Simulation Program in Mechanical Eng.", Faculty of Mech. Eng., Skopje, 2009.
		2.	R. V. Filkoski, I. J. Petrovski	Air Pollution Control, Textbook	DEREC Tempus JEP CD_JEP-19840-2004 "Development of Environmental and Resources Engineering Curriculum, Florence-Skopje, 2008.
		3.	M. Azievska (coord.), R. V. Filkoski et al.	Second National Communication on Climate Change	MESP, MASA, Skopje, 2008, ISBN 978-9989-110-68-9
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year

		1.	Filkoski R. V.	Experiences on the feasibility of the utilisation of vineyard and vine-culture residues for energy purposes	Symp. Biomass solutions for LCP and traffic in Adria region - R&D and application, Adria Section of Int. Combustion Institute, Sarajevo, 2014
		2.	Filkoski R., Tashevski D., Armenski S., Markov Z.	Expert report on the impossibility of hot start, technical problem on gas turbine, latent and other defects during installation and start-up of power plant TE-TO AD Skopje	Faculty of Mech. Engineering, Skopje, Dec. 2013 - Jan. 2014
		3.	I. J. Petrovski, R. V. Filkoski	Energy efficiency improvement and waste heat utilisation in bitumen processing	Technology development project co-fin. by the Ministry of Education and Science of RM, Skopje, 2011
		4.	R.V. Filkoski, I.J. Petrovski, M. Ginovska, H. Borchsenius	A Case Study of Energy Recovery in Ferro-Alloys Industry	II Reg. Conference IEEP ’10, Zlatibor, Serbia, 2010.
		5.	R. V. Filkoski, I. J. Petrovski, I. Janev	A Case Study of Energy Management Improvement in Concrete Products Industry	II Conference “Sustainable Development and Climate Changes SUSTAINNIS 2010”, Nis, Serbia, 2010.
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		50	
	11.2.	Master		7	
	11.3.	Doctoral		3	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.	R. V.Filkoski, L. Joleska Bureska, I. J. Petrovski	Assessment of the Impact of Under-	Chemical Eng. Transactions, AIDIC

				Fire Air Introduction on the Pulverised Coal Combustion Efficiency	Publ., 2013, 34, 25-30, DOI: 10.3303/CET1334005
		2.	Mikulcic H., Vujanovic M., Markovska N., Filkoski R. V., Ban M., Duic N.	CO_2 Emission Reduction in the Cement Industry	Chem. Eng. Trans., AIDIC Publ., 2013, Vol. 35, p.703-708, ISBN 978-88-95608-26-6; ISSN 1974-9791
		3.	V. Strezov, E. Popovic, R. V. Filkoski, P. Shah, T. Evans	Assessment of the Thermal Processing Behaviour of Tobacco Waste	Energy and Fuels, ACS Publications, 2012, 26, p.5930-5935
		4.	R. V. Filkoski	Pulverised-Coal Combustion with Staged Air Introduc-tion: CFD Analysis with Different Radiation Methods	The Open Thermodynamics Journal, Vol. 4(2010), Bentham Science Publ., 2010, p. 2-12.
		5.	R. V. Filkoski	Radiation Heat Transfer Modelling and CFD Analysis of Pulverised-Coal Com-bustion with Staged Air Introduction	Archives of Thermodynamics, Vol. 30(2009), No. 4, IFFM Publishers, 2009, p. 97-118.
		6.	R. V. Filkoski, S. V. Belošević, I. J. Petrovski, S. N. Oka, M. A. Sijerčić	CFD Technique as a Tool for Description of the Phenomena Occuring in Pulverised Coal Boilers	Proc. ImechE Part A: Journal of Power and Energy, Vol. 221 (3), 2007, p. 399-409.
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.	V. Strezov, E. Popovic, R. V. Filkoski, P. Shah, T. Evans	Assessment of the Thermal	Energy and Fuels, ACS Publications,

			http://pubs.acs.org/toc/enfuem/26/9#RenewableEnergy		Processing Behaviour of Tobacco Waste	2012, 26, p.5930-5935
		2.	R.V. Filkoski, L. Joleska Bureska, I.J. Petrovski http://www.aidic.it/cet/13/34/005.pdf		Assessment of the Impact of Under-Fire Air Introduction on the Pulverised Coal Combustion Efficiency	Chemical Engineering Transactions, AIDIC Publ., 2013, 34, p.25-30
		3.	R. V. Filkoski http://www.benthamscience.com/open/totherj/openaccess2.htm		Pulverised-Coal Combustion with Staged Air Introduc-tion: CFD Analysis with Different Radiation Methods	The Open Thermodynamics Journal, Vol. 4(2010), Bentham Science Publ., 2010, pp. 2-12.
		4.	R. V. Filkoski, S. V. Belošević, I. J. Petrovski, S. N. Oka, M. A. Sijerčić http://pia.sagepub.com/content/221/3.toc		CFD Technique as a Tool for Description of the Phenomena Occuring in Pulve-rised Coal Boilers	Proc. ImechE Part A: J. of Power and Energy, Vol. 221 **(3)**, 2007, pp. 399-409.
		5.	R. V. Filkoski, I. J. Petrovski, P. Karaś http://thermalscience.vinca.rs/2006/3/		Optimisation of Pulverised Coal Combustion by Means of CFD/CTA Modelling	(An International Journal of) Thermal Science, Vol. 10 **(3)**, Belgrade, 2006, pp. 161-179.
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	year
		1.	R. V. Filkoski, M. Chekerovska	Experimental and numerical study of a flat-plate solar energy collector performance	Proceedings of SEEP 2014	Dubai, 23-25 November, 2014
		2.	R. V. Filkoski, I. J. Petrovski	Research on the possibility of using	Proceedings of SEEP 2014	Dubai, 23-25 November,

				agriculture biomass residues for energy purposes		2014
		3.	Filkoski R. V.	Experiences on the feasibility of the utilisation of vineyard and vine-culture residues for energy purposes	Symp. Biomass solutions for LCP and traffic in Adria region - R&D and application, Adria Section of Int. Combustion Institute	Sarajevo, 2014
		4.	Filkoski R. V.	The smart energy concept: the demand side potential,	Workshop "Smart Grids and Power Highways for the Enlarged Europe: Assessing the Challenges", European Commission, JRC, Inst. for Energy and Transport, Petten	Antalya, 18-20 Sept., 2013
		5.	Filkoski R.V., Stojkovski F., Stojkovski V.	A CFD study of a solar chimney power plant operation	6th Int. Conf. on Sustainable Energy and Environmental Protection SEEP 2013	Maribor, 20-23 August 2013
		6.	Filkoski R.V., Petrovski I.J., Stanojevska B.	Some observations on the possibility of using wine twigs for energy needs	6th Int. Conf. on Sustainable Energy and Environmental Protection SEEP 2013	Maribor, 20-23 August 2013
		7.	Filkoski R.V., Bureska L.J., Petrovski I.J.	Improvement of combustion efficiency of pulverised coal with under-fire air introduction	7th Int. Conf. on Sustainable Development of Energy, Water and Environment Systems SDEWES 2012	Ohrid, 2012
		8.	Filkoski R. V., Bureska L.J.,	CFD as	5th Int. Mechanical	Prague,

			Petrovski I. J.	research, educational and design tool in energy and environmental engineering	Eng. Forum IMEF 2012	2012
		9.	Filkoski R. V.	Past and present research activities on combustion at the Faculty of Mechani-cal Engineering in Skopje	ACH Combustion Meeting, 2012	Zagreb, 2012
		10.	Filkoski R.V., Popovic E., Strezov V.	Experimental study of product composition during slow pyrolysis processing of tobacco residues	7th International Conference on Biomass for Energy	Kyiv, Ukraine, 2011

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Zoran Markov		
2.	Date of birth	23.06.1975		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D in Mechanical Engineering	2007	Faculty of Mechanical engineering - Skopje
		M. Sc. in Mechanical Engineering	2001	Faculty of Mechanical engineering - Skopje
		B. Sc. in Mechanical Engineering	1998	Faculty of Mechanical engineering - Skopje

6.	Area, field and particular specialty of master of science degree		Area	Field		Specialty
			Technical-technological sciences	Mechanical		Fluid mechanic and fluid flow systems
7.	Area, field and area of doctoral degree		Area	Field		Specialty
			Technical-technological sciences	Mechanical		Hydro energy
8.	If employed, state the institution where he/she works and the title and area in which is named		Institution		Title and area	
			University of Ss Cyril and Methodius, faculty of Mechanical engineering		Associate professor, Fluid flow and hydraulic machines	
9.	List of courses that the teacher is lecturing separately for first, second and third cycle					
	9.1.	List of courses that the teacher is lecturing in the first cycle				
		No.	Course	Study program/institution		
		1.	Fluid mechanics	EE, TI, TML, MV/ FME		
		2.	Hydraulic turbines and pumps	AFI / FME		
		3.	Hydropower plant	EE / FME		
	9.2.	List of courses that the teacher is lecturing in the second cycle				
		No.	Course	Study program/institution		
		1.	Theory of turbine and CFD simulation	AFI / FME		
		2.	Selected chapters of Fluid Mechanics	AFI / FME		
		3.	Waste water treatment	EE / FME		
	9.3.	List of courses that the teacher is lecturing in the third cycle				
		No.	Course	Study program/institution		
		1.	Transformation of renewable energy in hydraulic machines	Mechanics / FME		
		2.	Hydro energy and environment	Mechanics / FME		
10.	Selected work in the past five years					
	10.1.	Relevant scientific printed paper (up to 5)				
		No.	Author	Title		Publisher/year
		1.	Markov Z., Dimitrovski D., Jovanoski I., Nenchev A.	Production and Utilizing of Biogas and Other Measures for Increasing Energy Efficiency in the Municipal Wastewater Treatment Plant		Journal of Environmental Protection and Ecology, p.1014-1022, Vol. 14, no.3 (2013)
		2.	Iliev V., Popovski P., Markov Z.	A comparison of numerical prediction and experimental		Techniques, technologies, education and management

				dynamic behavior at transient regimes of hydropower plant	journal, Vol. 9, no.1 (2014)
		3.	Markov Z., Popovski P., Talevski G., Ristova E.	Manufacturing of a Centrifugal Pump Using Integrated Computer Aided Approach	International Virtual Journal Machines, Technologies, Materials, pp. 22-24, Issue 1, Year VII, 2013
		4.	Reskovski F., Markov Z., Lipej A., Sirok B.	Numerical Prediction Of Karman Vortex Street Phenomenon In NACA 4421 Aerofoil Wake	Mechanical Engineering - Scientific Journal, Faculty of Mechanical Engineering-Skopje, Vol. 30, no. 1-2, pp. 29-37, 2012
		5.	Iliev V., Popovski P., Markov Z.	Transient Phenomena Analysis in Hydroelectric Power Plants at Off-design Operating Conditions	International Journal of Engineering Research and Applications, Vol. 2, Issue 6, pp. 1480-1488, 2012
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Noshpal A., Stojkovski V., Markov Z.	Application of CAD and CAX technologies in electrical technique processes in energy and ecology	Ministry of education and science of Republic Macedonia 2006-2009
		2.	Popovski P., Markov Z., Popovski B.	Capacity Building of the Secondary Education Teachers in the Field of Environmental and Social Impact of Renewable Energy	UNESCO project, 2012
		3.	Tuneski A., Markov Z.	Monitoring and Improving the Rivers in the Vardar/ Axios Watershed (MIRVAX)	NATO PfP project, 2006-2008
		4.	Tuneski A., Markov Z.	Development of Environmental and Resources Engineering Curriculum (DEREC)	EU TEMPUS project, 2005-2008
		5.	Tuneski A., Markov Z	Development of Environmental and Resources Engineering Learning (DEREL)	EU TEMPUS project, 2010-2014
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Markov Z., Dimitrovski D., Aleksic V.	Development of gas distribution network for the city of Kumanovo – challenges and solutions	5th International gas conference of Southeast Europe, Sarajevo, Bosnia-Herzegovina, 2012

		2.	Popovski P., Markov Z.	Development of basic criteria for establishing of feed-in tariffs in r. Macedonia	Proceedings of the 5th Conference on sustainable development of energy, water and environment systems, Dubrovnik, Croatia, 2009, pp. 407
		3.	Jovanoski I., Popovski P. Markov Z., Tuneski A., Nencev A.	Monitoring and analysis of the operation of Kumanovo WWTP and proposed measures for increasing the efficiency of the aeration system	3rd international Conference challenges in the water sector in the EU accession process, Ministry of environment and physical planning, Skopje, 2012
		4.	Jovanoski I., Markov Z., Dimitrovski D., Kochubovski M.	Quality of the excess sewage sludge from municipal wastewater treatment plants, posibilities for use and disposal in R. Macedonia	International BENA Conference, SPHAMEER, Constanta, Romania, 2013

11.	Supervision (mentorship) of undergraduate, master and doctoral studies students		
	11.1.	Undergraduate	23
	11.2.	Master	4
	11.3.	Doctoral	1

12.	For mentors of doctoral thesis, selected work for the last four / five years					
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	Year
		1.	Markov Z., Jovanoski I., Shishovska M.,	"Methodology For Selection Of The Most Appropriate Technology For Municipal Wastewater Treatment Using Multi-Criteria Analysis"	South East European Conference on Sustainable Development of Energy, Water and Environment Systems - SEE SDEWES, Ohrid, http://www.ohrid2014.sdewes.org/	2014

App. 4		Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis		
1.	Name (First, Last)	**Ana Lazarevska**		
2.	Date of birth	11.12.1969		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Science		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.d In Engineering	2008	Faculty of Mechanical engineering - Skopje
		M. Sc. In Engineering	2001	Faculty of Mechanical engineering - Skopje
		B. Sc. In Engineering	1994	Faculty of Mechanical engineering - Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Technical-sciences	Mechanical	Fluid mechanics Environmental protection
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Technical-sciences	Mechanical	Environmental protection
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution	Title and area	
		University of Ss Cyril and Methodius, faculty of Mechanical engineering	Assistant professor, Environmental protection	

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		Nr.	Course	Study program/institution
		1.	Hydraulics and hydraulic machines	IND, PInf / FME
		2.	Systems for hydraulic and pneumatic transport	EE/FME
		3.	Hydraulic and pneumatic transport	AFI/FME
		4.	Designing systems for hydraulic and pneumatic transport	AFI/ FME

		5.	Practice in the industry , small and medium enterprises	AFI, EE / FME	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		Nr.	Course	Study program/institution	
		1.	Water protection and sustainable development	AFI / FME	
		2.	Evaluation of Environmental Impact	IZIS / Ss	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		Nr.	Course	Study program/institution	
		1.			
		2.			
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		Nr.	Author	Title	Publisher/year
		1.	Lazarevska, A. M, Mladenovska, D., Sørensen, Å. L., Glimsdal, A. I.,	"Carbon Emission Reduction Potential of the Gas-Fired Combined Cycle Heat and Power Plant "Energetika""	Proc. "Energetics 2010" International Symposium, Ohrid, 07-09 October, 2010.
		2.	Lazarevska, A. M, Mladenovska, D., Sørensen, Å. L., Glimsdal, A. I.,	"Is Modernization of Bitola Thermal Power Plant feasible as a Clean Development Mechanism Project"	Proc. "Energetics 2010" International Symposium, Ohrid, 07-09 October, 2010.
		3.	Lazarevska, A. M., Fischer, N., Münnich, K., Haarstrick, A	"A Multi-Criteria Decision Making Conceptual Approach to optimal Landfill Monitoring"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics: Geographical Information Processing and Visual Analytics for Environmental Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), Springer Science + Business Media, pp. 97–112, 2009

		4.	Nospal, A., Lazarevska, A. M	"Environmental protection and industry: Parameters necessary for environmentally related decision making"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics: Geographical Information Processing and Visual Analytics for Environmental Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), Springer Science + Business Media, pp. 97–112, 2009,
		5.	Lazarevska, A.M.	"Comparative Analysis of Parameters Obtained while Simulating an Air-Pollution Episode",	Mathematica Balkanica, New Series Vol. 20, 2006, Fasc. 1. pp. 49-62
	10.2.	Participation in scientific national and international projects (up to 5)			
		Nr.	Author	Title	Publisher/year
		1.	Cosmo – Innovative Center	EUREM (European Energy Manager) Plus	Co-funded by the Intelligent Energy Europe Programme of the EU, 2013 – 2015
		2.	Bilic, I.. Lazarevska, A.	Open Access to the Enterpreneuership Lifelong Learning (LLL) Education for Persons with Disabilities (PwDs) adjusted for Visually Impared Persons (VIPs), http://www.lll4business.org/	Alumni Engagement Innovation Fund (AEIF), US Department of State 2012 – 2014
		3.	Lazarevska, A.	Ensuring Equal Access through Service Learning for Persons with Disabilities, http://www.equalaccess4pwds.org/	AEIF, US Department of State 2011 – 2012. Macedonian-American Alumni Association (MAAA)
		4.	Lazarevska, A.M. Atanasovski, A.	"Regional JFDP Alumni Conference "Enhancing Accessibility of the Higher Education to the Disabled", Nov. 22-24, 2010 in Skopje/Ohrid, Macedonia": (http://www.maaa.com.mk/jfdp-conference-2010)	MAAA. Financed by the Junior Faculty Development Program (JFDP) Alumni Grant (JAG), under the auspices of the Alumni Local Initiative Grants Program, funded by the

					Bureau of Educational and Cultural Affairs of the US Department of State (ECA), administered by the American Councils for International Education: ACTR/ACCELS. (Aug 2010 – Dec 2010)
		5.	Tuneski A.	Development of Environmental and Resources Engineering Learning (DEREL)	EU TEMPUS проект, 2010 – 2014
		6.	Kochov, A.	Cleaner Production (CP) Training (CIRKO National Cleaner Production Center – Macedonia	UNIDO Funded, 2010 – 2011
		7.	A. Nospal et al.	Application of CFD and CAX Technologies in Fluid Flow Processes in Energetics and Ecology.	FME,Ss, financed by the Ministry of education and science, 2006–2009
	10.3.	Printed books in the last five years (up to 5)			
		Nr.	Author	Title	Publisher/year
		1.	Lazarevska, A. M., Bilić, I., Koçi, A. (Eds.),	"Book of Case Studies: Service Learning Success Stories in Macedonia and Croatia"	MAAA, 2012:
		2.	Lazarevska, A. M., et al.,	"Guidelines for Correct Attitude towards Persons with Disabilities or Limited Abilities in Higher Education" (Eds. Lazarevska, A. M., Trajkovski, V., Petrov, R.), in English (ISBN 978-608-4700-01-2), Macedonian (ISBN 978-608-4700-02-9), Croatian and Albanian	MAAA, 2012:
		3.	Ristovska M. 2012:	„Guidelines for Effective Introduction and Implementation of Service–Learning in Higher Education", (Eds. Lazarevska, A. M., Nikolov, A., Stankovic, M.), in Macedonian (ISBN 978-608-4700-03-6). (Eds. Lazarevska, A. M., Stankosky, M., Koçi, A.), in English (ISBN 978-608-4700-00-5),	MAAA, 2012:
		4.	Kochi, A., Reka, A., Lazarevska, A. M. (Eds.), 2011	"Model United Nations: A model for extracurricular Activity", pp. 43 (Eng.), (ISBN 978-608-65257-2-9).	MAAA, 2012:

		5.	Vaclav Smil (translated book)	Energy in Nature and Society	Datapons, 2013
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		Nr.	Author	Title	Publisher/year
		1.	Mladenovska, D., Lazarevska, A. M	Determining Relevant Attributes and Corresponding Indicators in a Decision Making Concept for Site-Selection of Coal Fired Thermal Power Plants	BALKANMINE 2013, Vth JUBILEE BALKAN MINING CONGRESS, 18 ÷ 21th September 2013 – Ohrid, Macedonia
		2.	Peeva, L., Jovanovski, D., Lazarevska, A. M., Shushlevska, M.	Cleaner Production Assessment Report of MEGA DOOEL Skopje	2010 – 2011 Cleaner Production (CP) Training (CIRKO National Cleaner Production Center – Macedonia – UNIDO Funded), 2011
		3.	Lazarevska, A., M.	Draft PDD for the CDM Project: "Gas-Fired Combined Cycle Heat and Power Plant "Energetika"	for AD ELEM, 2010, financed by project leaded by Norsk Energi, Norway
		4.	Lazarevska, A., M.	Draft PDD for the CDM Project: "Rehabilitation of Bitola Thermal Power Plant"	for AD ELEM, 2010, financed by project leaded by Norsk Energi, Norway
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		2	
	11.2.	Master		-	
	11.3.	Doctoral		-	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		Nr.	Author	Title	Publisher/year
		1.	Lazarevska, A. M., Fischer, N., Münnich, K., Haarstrick, A.	"A Multi-Criteria Decision Making Conceptual Approach to optimal Landfill Monitoring"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics: Geographical Information Processing and Visual Analytics for Environmental

					Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), **Springer Science + Business Media, 2009**
		2.	Nospal, A., Lazarevska, A. M.	"Environmental protection and industry: Parameters necessary for environmentally related decision making"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics: Geographical Information Processing and Visual Analytics for Environmental Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), **Springer Science + Business Media, 2009**
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		Nr.	Author	Title	Publisher/year
		1.	Lazarevska, A. M., Fischer, N., Münnich, K., Haarstrick, A.	"A Multi-Criteria Decision Making Conceptual Approach to optimal Landfill Monitoring"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics: Geographical Information Processing and Visual Analytics for Environmental Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), **Springer Science + Business Media, 2009**
		2.	Nospal, A., Lazarevska, A. M.	"Environmental protection and industry: Parameters necessary for environmentally related decision making"	Published in NATO Science for Peace and Security Series – C: Environmental Security "GeoSpatial Visual Analytics:

					Geographical Information Processing and Visual Analytics for Environmental Security", (Eds. De Amicis, R., Stojanovic, R., Conti, G.), **Springer Science + Business Media, 2009**
	12.3.	Proof of at least three international meetings' participation in the past four years			
		Nr.	Author	Title	International meeting/conference	year
		1.	Lazarevska, A. M, Mladenovska, D., Sørensen, Å. L., Glimsdal, A. I.,	"Carbon Emission Reduction Potential of the Gas-Fired Combined Cycle Heat and Power Plant "Energetika""	Proc. "Energetics 2010" International Symposium, Ohrid, 07-09 October.	2010
		2.	Lazarevska, A. M, Mladenovska, D., Sørensen, Å. L., Glimsdal, A. I.,	"Is Modernization of Bitola Thermal Power Plant feasible as a Clean Development Mechanism Project"	Proc. "Energetics 2010" International Symposium, Ohrid, 07-09 October.	2010
		3.	Mladenovska, D., Lazarevska, A. M	Determining Relevant Attributes and Corresponding Indicators in a Decision Making Concept for Site-Selection of Coal Fired Thermal Power Plants	BALKANMINE 2013, Vth JUBILEE BALKAN MINING CONGRESS, 18 ÷ 21th September 2013 – Ohrid, Macedonia	2013

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Dame Dimitrovski		
2.	Date of birth	21.11.1979		
3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		PhD.	2010	UKIM, Faculty of Mechanical engineering

		Magister of technical sciences	2007	UKIM, Faculty of Mechanical engineering
		Mechanical engineer	2003	UKIM, Faculty of Mechanical engineering
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Energetic, Mechanical engineering	Thermoenergy	IC engines and environment
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Energetic, Mechanical engineering	Thermoenergy	IC engines and environment

8.	If employed, state the institution where he/she works and the title and area in which is named	Institution	Title and area	
		University of St. Cyril and Methodius in Skopje, Faculty of Mechanical engineering	Docent, Thermotechnics and Thermoenergetics	

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Design and tuning of IC engines	TI, MFS
		2.	Energy from waste	EE, MFS
		3.	Fuels and engines	All, MFS
		4.	Environmental impact assessment from energy processes	EE, MFS
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	Waste treatment technologies	EE, MFS
		2.	Energy management	BZPR, MFS
		3.	IC engines advanced technology 1	TI, MFS
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.		

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Dame Dimitrovski	Introducing natural gas as a	Combustion

				second fuel and reconstruction of a diesel engine to use dual fuel technilogy – emissions, economy	Institute, Western States, USA, 2008, University of Southern California
		2.	Dame Dimitrovski	Using CNG and Diesel in the City Bus Transport in Skopje	Proceedings of the 2008 Technical Meeting of the Central States Section of The Combustion Institute, USA, 2008
		3.	Dame Dimitrovski	Union Regulations of Road Transport Air Pollution and Its Implementation in the Macedonia	JEPE
		4.	Zoran Markov, Dame Dimitrovski	Production and Utilising of Biogas and Other Measures for Increasing Energy Efficiency in the Municipal Wastewater Treatment Plant	JEPE
		5.	Dame Dimitrovski, Martina Dimeska	Possible directions for strategic connection of Republic of Macedonia to the European natural gas streams	Proceedings of the Institute of Gas Technology
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski, Vanco Donev, Elenior Nikolov, Dame Dimitrovski	Adjustment of the car park - buses JSP and the use of eco fuels, natural gas, development project	Ministry of education and science, Skopje 2003
		2.	Dame M. Dimitrovski	Using of Biogas for cogenerative systems at sanitary landfill - Drisla Skopje	Project for World Scientific Organization pages 6+52
		3.	Dame Dimitrovski, Sonja Filipovska,	Lowering the influence of using day lights and a mean to reduce the emission from small	National Agency for Traffic Safety on the roads in 2009,

				vehicles	Study
		4.	Dame Dimitrovski,	Emissions and Imissions in the city of Tetovo, traffic development influence on the imissions,	National Agency for Traffic Safety on the roads in 2008, Study
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Mile Dimitrovski Dame Dimitrovski	Publication: Agro Energy study possibilities for the use of renewable energy sources in rural areas in the country	Study Agro, Energy Study nr. 008/2009 – Biogas 2009
		2.	Dame Dimitrovski	Monograph: Reducing air pollution in Skopje by replacing existing fossil fuels with natural gas, a candidate for the award Gotse Delchev 2008, Skopje, ISBN 978-9989-9812-8-9	2008, Institute of gaseous technique, Ministry of education and science of the Republic of Macedonia
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Dame M. Dimitrovski	Awarded labor original research results published in scientific reference / professional journal with an international editorial board: Ecological benefits of NG buses in Skopje, Awarded article	International Gas conference, Beograd, Serbia, 2007
		2.	Z. Markov, D.Dimitrovski, V.Aleksic	Development of Gas Distribution Network for the city of Kumanovo – Challenges and Solutions, International Gas Conference of South Eastern Europe	Proceedings of the Institute of Gas Technology
		3.	D. Dimitrovski, M. Stojanovski, D. Stojanovska	Virtual pipelines – short cut to natural gas utilization, International Gas Conference of South Eastern Europe	International Gas Conference, Sarajevo 2012

		4.	Dame Dimitrovski	Why biogas from agriculture and livestock, haven't became the basis for rural development in Macedonia	Zemak, Ohrid, 2010
		5.	Done Tashevski, Dame Dimitrovski	Optimization of binary co-generative thermal power plants with SOFC on solid fuel	JETP
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		27	
	11.2.	Master		5	
	11.3.	Doctoral		/	
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.	Gordana Popsimonova, Biljana Ristovska, Dame Dimitrovski (CA), Goce Georgievski	Greenhouse production in Macedonia – challenges and opportunities	MESJ 77–84, UDC 621, CODEN: MINSC5, ISSN 1857 – 5293
		2.	Dame Dimitrovski, Blagojce Bogatinovski	Review of printed scientific paper in Mechanical engineering up to date MESJ, review	Mechanical engineering – Scientific journal vol.30, 2012
		3.	Dame Dimitrovski, Goran Dimeski	Possibilities for pollution reduction from households by implementing natural gas	Mechanical engineering – Scientific journal vol 32-1, 2014
		4.	Dame Dimitrovski, Mile Dimitrovski, Elena Kitanovska, Done Tashevski	Pollution from diesel engine with emphasis on pollution in Macedonia	Mechanical engineering – Scientific journal vol 32-1, 2014
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.	Z. MARKOV, D. DIMITROVSKI, I. JOVANOSKI, A. NENCHEV.	Production and Utilising of Biogas and Other Measures for Increasing Energy Efficiency in the Municipal	Journal of environmental protection and ecology, 2013, vol.3

				Wastewater Treatment Plant p.1014	
		2.	M. DIMITROVSKI, Z. SAPURIC, D. DIMITROVSKI CA, M. KOCHUBOVSKI.	European Union Regulations of Road Transport Air Pollution and Its Implementation in the FYR Macedonia p.813	Journal of environmental protection and ecology, 2013, vol.3A
		3	Done Tashevski, Dame Dimitrovski	Optimization of binary co-generative thermal power plants with SOFC on solid fuel	Chemical Engineering Transactions, Journal ISSN: 19749791
		4	D. Tashevski, R. Filkoski, D. Dimitrovski, I. Shesho	Analysis of Parameters Affecting the Efficiency Optimization of Binary SOFC Co-generation Power Plants.	International Journal of Mechanical Engineering and Technology (IJMET), (ISSN 0976–6359 Online), Volume 5, Issue 10, pp. 180-190, India, 2014 (JIF 7,5377)
		5	Dame Dimitrovski, Mile Dimitrovski, Antonio Jovanovski	Model for calculation of NOx from public transport in the city of Skopje	JEPE, 2014, accepted for publishing, vol 4

12.3.	Proof of at least three international meetings' participation in the past four years				
	No.	Author	Title	International meeting/conference	year
	1.	D. Dimitrovski, M. Dimitrovski, E. Kitanovska, D. Tashevski:	Pollution from Diesel Engines do to Increase of Imported Vehicles in FYR-Macedonia. (IOC - 2nd Award)	1st International Medical Conference "Environment and Public Health" MED ENV 2014, Mamaia, Romania,	12-14 September 2014.
	2.	D. Dimitrovski, M. Dimitrovski, G. Popsimonova, D. Tashevski	Biogas – Overview of the Possibilities for Implementation in the Macedonian	16th Symposium on Thermal Science and Engineering of Serbia –	22-25 October, 2013.

				Agricultural Sector. (IOC)	SIMTERM 2013, p. 11, Sokobanja, Serbia,	
			D. Dimitrovski, K. Belcheska, D. Tashevski, M. Kocubovsk	Possible Scenarios for Achiving the Goal 20/20/20 in FYR-Macedonia.	1st Internatinal U.O.C. – B.E.N.A. – Conference "The Sustainability of Pharmaceutical, Medical and Ecological Education and Research – SPHAMEER – 2013", p. 6, Constanca, Romania. (IOC)	20-23 June, 2013.
			D. Tashevski, D. Dimitrovski, Z. Markov, I. Shesho:	Energy and Ecology Benefits of Independent SOFC/Gas Turbine Co-generation Power Plant on Natural Gas.	1st Internatinal U.O.C. – B.E.N.A. – Conference "The Sustainability of Pharmaceutical, Medical and Ecological Education and Research – SPHAMEER – 2013", p. 6, Constanca, Romania,	20-23 June, 2013. (IOC)
			D. Dimitrovski, M. Dimevska, D. Tashevski:	Strategic connection of Republic of Macedonia to the European natural gas streams. (IOC)	International gas conference of South Eastern Europe, Sarajevo, Bosnia and Herzegovina,	2012

Add. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**	
1.	Name (First, Last)	Darko Babunski

2.	Date of birth	04.10.1975			
3.	Scientific degree / Title	Ph.D./Assistant Professor			
4.	Title of the scientific degree	Ph.D. in Technical Sciences			
5.	Year and institution of the scientific degree	Education	Year	Institution	
		Ph.D	2012	Faculty of Mechanical Engineering - Skopje	
		M.Sc	2006	Faculty of Mechanical Engineering - Skopje	
		B.Sc	1999	Faculty of Mechanical Engineering - Skopje	
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty	
		Technical Sciences	Mechanical Engineering	Control Systems	
7.	Area, field and area of doctoral degree	Area	Field	Specialty	
		Technical Sciences	Mechanical Engineering	Control Systems	
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area	
		Faculty of Mechanical Engineering –Skopje		Assistant Professor, Automation	
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Programmable Logic Controllers	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje	
		2.	Control and automation of HEP	Energetics and Ecology/ Faculty of Mechanical Engineering – Skopje	
		3.	Practice in the industry, small and medium enterprises	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.	Computer control of machines and processes	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje	
		2.	Real – Time control systems and Hardware–in-the-loop	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje	
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.			
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year

		1.	I. Mihajlovic, D. Babunski et al.	"Comparison of Spectrolyser Device Measurements with Standard Analysis of Wastewater Samples in Novi Sad, Serbia "	Bulletin of Environmental Contamination and Toxicology, September 2014, Volume 93, Issue 3, pp 354-359 SCI=1.216
		2.	V. Iliev, D. Babunski, et al.	Direct Digital Control of HVAC System and CO2-Based Demand Controlled Ventilation	International Journal of Innovative Technology and Exploring Engineering™ (IJITEE), p.12-17, Vol. 3, no.9 (2014), SCI=0,546
		3.	D. Babunski, E. Zaev, A. Tuneski	Simulation of Load Rejection on a Nonlinear Hydro Power Plant Model with Mixed Mode Nonlinear Controller	proceedings of MECO 2012 conference, Bar, Monteenegro, pp. 275-278
		4.	E. Zaev, D. Babunski et. al	HPP Simulator for real-time simulation and SCADA software testing	Proceedings of the 6-th Annual South East European Doctoral Students Conference, Thessaloniki, Greece, 2011
		5.	D. Babunski, E. Zaev, A. Tuneski	SCADA simulation for monitoring and control of HPP using Robust Law	Proceedings of the IX National Conference With International Participation ETAI 2009, Section A, pp 90, Ohrid, R. Macedonia, 2009
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	A. Tuneski, D. Babunski et al.,	Development of Environment and Resources Engineering Learning - DEREL	TEMPUS Joint Project JP-511001-2010, 2010-2014
		2.	A. Tuneski, D. Babunski et al.,	Development of Environment and Resources Engineering Curriculum -	TEMPUS Joint European Project JEP-

				DEREC	19028_20042005-2008,
		3.	A. Tuneski, D. Babunski et al.,	"Monitoring and Improving the Rivers in the Vardar/Axios Watershed (MIRVAX)",	NATO Partnership for Peace cofinanced project, SfP981877, 2006-2008
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		7	
	11.2.	Master		1	
	11.3.	Doctoral			
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference	Year
		1.				

App. 4	**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Emil Zaev		
2.	Date of birth	13.02.1976		
3.	Scientific degree / Title	Ph.D./Assistant Professor		
4.	Title of the scientific degree	Ph.D. in Technical Sciences		
5.	Year and institution of the scientific degree	Education	Year	Institution
		Ph.D	2013	Faculty of Mechanical Engineering - Skopje
		M.Sc	2006	Faculty of Mechanical Engineering - Skopje

		B.Sc	1999	Faculty of Mechanical Engineering - Skopje
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Technical Sciences	Mechanical Engineering	Control Systems
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Technical Sciences	Mechanical Engineering	Control Systems

8.	If employed, state the institution where he/she works and the title and area in which is named	Institution	Title and area
		Faculty of Mechanical Engineering –Skopje	Assistant Professor, Automation

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.	Monitoring and Control	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
		2.	Control and automation of HEP	Energetics and Ecology/ Faculty of Mechanical Engineering – Skopje
		3.	Practice in the industry, small and medium enterprises	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	Study program/institution
		1.	Proportional technology	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
		2.	Real – Time control systems and Hadrware–in-the-loop	Automatics and Control Systems, Faculty of Mechanical Engineering – Skopje
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	Study program/institution
		1.		

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Emil Zaev, Gerhard Rath, and Hubert Kargl	“Energy Efficient Active Vibration Damping“	SICFP2013, Sweden, 2013
		2.	Gerhard Rath and Emil Zaev	“Cylinder Pressures in a Position Controlled SystemWith Separate Meter-in and Meter-out”	Scandinavian International Conference on Fluid Power, 2013
		3.	Emil Zaev, Gerhard Rath, et al.	“HPP Simulator for Real-Time Simulation and SCADA Software Testing“	DSC2011, Thessaloniki, Greece, 2011
		4.	Emil Zaev, Gerhard Rath,	“Design of a Hydraulic	SysStruc 2011,

			Hubert Kargl	Damper for Heavy Machinery"	Resita Romania, 2011
		5.	Emil Zaev, Gerhard Rath, et al.	"Hydro Power Plant Governor Testing Using Hardware-In-The-Loop Simulation",	MECO 2012, Bar, Montenegro, 2012
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Atanasko Tuneski, Emil Zaev et al.,	Development of Environment and Resources Engineering Learning - DEREL	TEMPUS Joint Project JP-511001-2010, 2010-2014
		2.	Atanasko Tuneski, Emil Zaev et al.,	Development of Environment and Resources Engineering Curriculum - DEREC	TEMPUS Joint European Project JEP-19028_20042005-2008,
		3.	A. Tuneski, Emil Zaev, et al.	"Monitoring and Improving the Rivers in the Vardar/Axios Watershed (MIRVAX)",	NATO Partnership for Peace cofinanced project, SfP981877, 2006-2008
		4.	A. Tuneski, D. Babunski, E. Заев i dr.	"Proektiranje na SCADA sistem za dalechinsko upravuvawe i monitoring na tehnoloshkite procesi vo prehrambena i cementna industija"	proekt za tehnoloshki razvoj finansiran od GTZ (German Technical Cooperation) 2003
		5.	A. Tuneski, D. Babunski, E. Заев i dr.	"Optimalno, robustno upravuvawe na nelinearni sistemi so nadvoreshni poremetuvanja"	Ministerstvoto za obrazovanie i nauka na R. Makedonija, 2003-2006
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.			
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate		5	
	11.2.	Master			
	11.3.	Doctoral			
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			

		No.	Author	Title		Publisher/year
		1.				
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years				
		No.	Author	Title		Publisher/year
		1.				
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	Year
		1.				

Add. 4		**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**			
1.	Name (First, Last)	Emilija Celakoska			
2.	Date of birth	13.11.1975			
3.	Scientific degree / Title	Ph.D			
4.	Title of the scientific degree	Ph.D. in Mathematical Sciences			
5.	Year and institution of the scientific degree	Education	Year	Institution	
		Ph.D	2010	Faculty of Natural Sciences and Mathematics - Skopje	
		MSc	2006	Faculty of Natural Sciences and Mathematics - Skopje	
		BSc	1999	Faculty of Natural Sciences and Mathematics - Skopje	
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty	
		Mathematical Sciences	Mathematics	Differential Geometry	
7.	Area, field and area of doctoral degree	Area	Field	Specialty	
		Mathematical Sciences	Mathematics	Differential Geometry	
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area	
		Faculty of Mechanical Engineering -Skopje		Assistant Professor, Mathematics	
9.	List of courses that the teacher is lecturing separately for first, second and third cycle				
	9.1.	List of courses that the teacher is lecturing in the first cycle			
		No.	Course	Study program/institution	
		1.	Engineering mathematics	PINF, IND, DK	
		2.	Structured programming	MHT	
		3.	Basics of programming	All of 4-year studies	

		4.	Programming languages	PINF	
		5.	Object oriented programming	PINF	
	9.2.	List of courses that the teacher is lecturing in the second cycle			
		No.	Course	Study program/institution	
		1.			
	9.3.	List of courses that the teacher is lecturing in the third cycle			
		No.	Course	Study program/institution	
		1.	Nonholonomic geometry in mechanical systems	Mechanical engineering/Faculty of Mechanical Engineering	
10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Trencevski Kostadin, Celakoska Emilija, Balan Vladimir	Research of Gravitation in Flat Minkowski Space	Springer/ 2011, Int. J Theoretical Phys 50(1),1-26 (IF2012: 1.086)
		2.	Trencevski Kostadin, Celakoska Emilija	Geodetic Precession and Frame Dragging Observed Far from Massive Objects and Close to a Gyroscope	Springer/ 2011 Cent Eur J Phys 9(3), 654-661 (IF2012: 0.905)
		3.	Celakoska Emilija, Chakmakov Dushan	Lorentz Link Problem and Solutions	Math. Nat. Sci., South-West Univ. "Neofit Rilsky", Blagoevgrad/ 2011, Proc. IV Int. Sci Conf, FMNS2011. Vol.1, 16-21.
		4.	H.M.Srivastava, N. Tuneski, E. Celakoska	Some Distortion and Other Properties Associated with a Family of the n-Fold Symmetric Koebe Type Functions	Victoria Univ./2012 Austral. J Math. Anal. Appl, 9(2) 1-17
		5.	K.Trenchevski, E. Celakoska	Equations of motion for two-body problem according to an observer inside the gravitational field	Taylor&Francis/2011 J. Dyn. Syst. Geom. Theor. 9 (2), 115-135.
	10.2.	Participation in scientific national and international projects (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Nikola Tuneski, PhD	Geometric theory of functions and applications	Ministry of education and science/ 2001-2004
		2.	Kostadin Trenchevski, PhD	Differential-geometric and topological problems and their application	Ministry of education and science, 2006-2009
		3.	Dushan Chakmakov,	Combining and optimizing	Ministry of education

			PhD	classifiers for pattern recognition applications	and science, 2003 - 2006
		4.	Nikola Tuneski, PhD	Theory of univalent functions and applications	Ministry of education and science and TUBITAK-Turkey, 2006 - 2008
		5.	Zivorad Tomovski, PhD	Linear and Nonlinear Fractional Models	Bilateral project Macedonia - Austria, 2011-2013
	10.3.	Printed books in the last five years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	N.Tuneski, E. Celakoska	Introduction to MATLAB	Faculty of Mechanical Engineering –Skopje, 2010
	10.4.	Printed professional papers in the last 5 years (up to 5)			
		No.	Author	Title	Publisher/year
		1.	Celakoska Emilija**,** Trencevski Kostadin	On Radial Deformations of Rotating Disc	Proceedings of IV congress of mathematicians of Republic of Macedonia, 2011, 215-221
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students				
	11.1.	Undergraduate			
	11.2.	Master			
	11.3.	Doctoral			
12.	For mentors of doctoral thesis, selected work for the last four / five years				
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years			
		No.	Author	Title	Publisher/year
		1.			
	12.3.	Proof of at least three international meetings' participation in the past four years			
		No.	Author	Title	International meeting/conference	year
		1.				

Add. 4		**Information about the teachers that lecture at the first, second and third study program and are mentors on the doctoral thesis**
1.	Name (First, Last)	Bojan Prangoski
2.	Date of birth	29.07.1984

3.	Scientific degree / Title	Ph.D.		
4.	Title of the scientific degree	Ph.D. in Theoretical Mathematics		
5.	Year and institution of the scientific degree	Education	Year	Institution
		B.S. in Mathematics	2007	Faculty of Science, University Ss. Cyril and Methodius, Skopje
		M.Sc. in Theoretical Mathematics	2010	Faculty of Science, University Ss. Cyril and Methodius, Skopje
		Ph.D. in Theoretical Mathematics	2013	Faculty of Science, University of Novi Sad, Novi Sad, Serbia
6.	Area, field and particular specialty of master of science degree	Area	Field	Specialty
		Theoretical Mathematics	Functional Analysis	Theory of distributions
7.	Area, field and area of doctoral degree	Area	Field	Specialty
		Theoretical Mathematics	Functional Analysis	Ultra distributions, Pseudo differential operators
8.	If employed, state the institution where he/she works and the title and area in which is named	Institution		Title and area
		Faculty of Mechanical Engineering, Dept. of Mathematics and Informatics, University "Ss. Cyril and Methodius"		Assistant professor

9.	List of courses that the teacher is lecturing separately for first, second and third cycle			
	9.1.	List of courses that the teacher is lecturing in the first cycle		
		No.	Course	Study program/institution
		1.		
	9.2.	List of courses that the teacher is lecturing in the second cycle		
		No.	Course	
		1.		
	9.3.	List of courses that the teacher is lecturing in the third cycle		
		No.	Course	
		1.		

10.	Selected work in the past five years				
	10.1.	Relevant scientific printed paper (up to 5)			
		No.	Author	Title	Publisher/year
		1.	S.Pilipovic, B.Prangoski	On the convolution of Roumieu	Monatshefte fur Mathematik, **173** 1 (2014), 83-105

				ultradistributions through the ε tensor product		
		2.	B.Prangoski	Laplace transform in spaces of ultradistributions	Filomat, **27** 5 (2013), 747-760	
		3.	S. Pilipovic, B. Prangoski	Anti-Wick and Weyl quantization on ultradistribution spaces	J. Math. Pures Appl., online April 2014, http://dx.doi.org/10.1016/j.matpur.2014.04.011	
	10.2.	Participation in scientific national and international projects (up to 5)				
		No.	Author	Title	Publisher/year	
		1.				
	10.3.	Printed books in the last five years (up to 5)				
		No.	Author	Title	Publisher/year	
		1.				
	10.4.	Printed professional papers in the last 5 years (up to 5)				
		No.	Author	Title	Publisher/year	
		1.				
11.	Supervision (mentorship) of undergraduate, master and doctoral studies students					
	11.1.	Undergraduate		-		
	11.2.	Master		-		
	11.3.	Doctoral		-		
12.	For mentors of doctoral thesis, selected work for the last four/five years					
	12.1.	Proof of printed scientific papers in international scientific journals or international publications in the related field (up to 6) in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.2.	Proof of at least two printed scientific papers in international scientific journals that have impact factor in the related field in the past five years				
		No.	Author	Title	Publisher/year	
		1.				
	12.3.	Proof of at least three international meetings' participation in the past four years				
		No.	Author	Title	International meeting/conference	year
		1.				

18. Teachers statement of consent for participation in teaching specific subjects of the study program (only for teachers that are not employed at the faculty of Mechanical engineering - Skopje)

The document is attached in Appendix 5 at the end of this elaborate.

19. Consent from the higher educational institution for teacher participation in the realization of the study program (only for teachers that are not employed at the faculty of Mechanical engineering – Skopje)

Not applicable

20. Information about the number of students enrolling in the first year of the study program

According to estimates of the spatial features, the equipment and personnel potential for study program in Sustainable energy and environment it is planned to enroll up to 30 students per year.

21. Information for providing required and additional literature

Predicted required and additional literature (given in the subject programs) is provided by subject teachers, and some are located in the library of the Faculty of Mechanical Engineering. As required literature will be used literature translated and distributed by the Government from the subject programs where it exists.

22. Information for the web-page

All information about the study program at faculty of Mechanical engineering – Skopje are available at the web page of the faculty: www.mf.edu.mk

23. Professional or scientific name by which the student acquires after completion of the study program

Students who get university, academic one year full time studies in the second cycle at the Sustainable energy and environment study program acquires the following title:

In Macedonian:

МАГИСТЕР ПО ТЕХНИЧКИ НАУКИ ОД ОБЛАСТА НА МАШИНСТВОТО

In English:

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

24. Activities and mechanisms to develop and maintain the quality of teaching

24.1. Teaching methods

The study program is implemented as a full-time study with the following types of instruction: lectures, lab work, computer tutorials and seminars. Regular classes are implemented for subjects where there are 5 or more students. Where the number of students is less than 5, it is organized mentor teaching.

The load of students is realized through specific types of activities, such as individual work, assignments and projects aimed at the study of practical cases relevant areas of research studies, teamwork, research, self-study and participation in workshops. Particular attention is paid to individual work with students in the form of mentoring and consultancy work.

The scope and organization of the studies were conducted in accordance with Article 112 of the Law on Higher Education of the Republic of Macedonia and Article 23 of the Rules of the first and second cycle studies of Ss according to ECTS methodology, or total student workload expressed in volume of 60 credits per year after 30 hours of placement credit, which is equal to 1800 hours per load. The number of hours per load distributed on the number of weeks in two semesters, 30 weeks weekly expresses the total student workload (teaching and specific forms of activity).

24.2. Verification methods of knowledge

Verification of knowledge is done through continuous assessment and final examination through. In the course programs that are implemented in the point 13 of this elaborate for each subject individually it is determined how to assess the knowledge and appreciation of the proportion of continuous assessment activities or defined points that provides the student with the implementation of individual actions defined in the respective program.

The final assessment of each of the subjects of this study program is formed on the basis of continuous assessment and final results achieved by the student. The final grade is based on the total score of the final or continuing assessment student won, and the maximum number of possible score is 100. The assessment is made pursuant to Rule 35 of the Rules of the first and second cycle studies Ss applying numerical scoring system respecting equivalent alphabetic grading system according to ECTS.

Students conquer this study program by passing the exams and accomplishing a certain number of ECTS credits, in accordance with the structure of the study program.

24.3. Activities and mechanisms for the development and maintenance of the quality of the study program

In order to develop and maintain the quality and quality control in the study program are implemented methods of continuous evaluation, self-evaluation and system for assessing the quality of the teaching staff in accordance with the provisions of the Law on Higher Education of the Republic of

Macedonia and article 73 and 77, and in accordance with the established mechanisms for evaluation within Ss.

The provision and maintenance of quality and quality control will be carried out in accordance with the mechanisms and activities that are conducted for all study programs and apply to all participants in the educational process of the faculty of Mechanical engineering. Mentioned activities and mechanisms of self-evaluation concerning:

- development of curricula,
- realization of the curriculum,
- student assessments,
- preparation of the thesis,
- assessing the quality of teaching by students with surveys at the end of each semester for each subject,
- assess the quality of study programs by students awarded the diploma and other procedures relating to resources and logistics of the teaching process

Evaluation by students for every subject, and for study programs in general are consistently implemented and taken into account in the evaluation and development of all study programs.

The activities for the development and maintenance of quality control and the quality of the study program, apply monitoring the situation with the success of students and the implementation of the program by the teaching council of Mechanical Engineering. Teaching council conducted an internal evaluation of the content of the study program in order to improve and develop in line with modern developments in the field.

24a. Results derived from the Guidelines for self-evaluation only basis of the evaluation and the evaluation procedures adopted by universities Agency for Evaluation of Higher Education in the Republic of Macedonia and the Interuniversity Conference of Macedonia (Skopje, Bitola, September 2002).

Taking into consideration the orientation for continuous inspection, evaluation, the provision and improvement of the quality in all the areas of its action at the University "Sv. Cyril and Methodius "in Skopje the fourth Foreign evaluation by a team of experts nominated by the European association of universities is in progress. The results are published in the report for the subsequent evaluation of Ss Cyril and Methodius University in Skopje for the period 2010/11 to 2012/13 years.
Also at the web site of Ss results are published from the report for the subsequent evaluation of Ss Cyril and Methodius University in Skopje for the period 2006/07 to 2009/10 years, issued by the European Association of Universities, 2011 year.

http://ukim.edu.mk/mk_content.php?meni=155&glavno=1

COURSES OFFERED AT UNIVERSITY LEVEL - LIST (ALL M5 COURSES)