TECHNOLOGICAL EDUCATION INSTITUTE OF

CENTRAL MACEDONIA

SCHOOL OF TECHNOLOGICAL APPLICATIONS

DEPARTMENT OF MECHANICAL ENGINEERING

Graduate Studies Program:	"Renewable Energy Systems: Design, Development and Optimization"
Academic Year 2017 – 18	

Master of Science (M.Sc.) in:

"Renewable Energy Systems: Design, Development and Optimization"

COURSE GUIDE

Fifth Session:

October 2017 – January 2019

Dear Students

Welcome to the Graduate Studies Program in ***"Renewable Energy Systems: Design, Development and Optimization"***, offered by the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, at Serres, Greece.

The 5th Session of the M.Sc. Program commences at the beginning of the Academic Year 2017 – 18.

FOCUS OF THE PROGRAM

The Graduate Studies Program organized by the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, at Serres, Greece focuses on the promotion and transfer of knowledge & expertise, operational tools & methodology in the field of Renewable Energy (RE) sources. It aims to train graduate students in the design, development & optimization of mechanical systems, equipment and processes for the most efficient utilization of RE sources, in an effort to fill the gap between the growing industry demands for specialized RE expertise and the skills currently available in the job market.

The major axes of the Graduate Studies Program under consideration are:

(a) To present and analyze the mechanical systems and processes used in the modern production of all major types of RE, as well as their design, development and optimization principles, thus providing to graduate students the appropriate high level of knowledge and the specialized

expertise needed to man the production and administration units of the companies associated with the exploitation of energy from RE sources.

(b) To infuse to young scientists principles and values, in order to effectively contribute to climate protection - promoting the production of electricity from RE sources - which is a key component of sustainable development and a top environmental priority of our Country (see, e.g., Greek Legislation, Law No 3851/2010).

(c) To prepare energy executives specialists with a clear knowledge on the modern tendencies in Mechanical Science & Technology, and to cultivate their synthetic interpretive skills in order to become able to develop innovative approaches, to exploit opportunities and to solve problems in the energy sector.

In a few words, the Graduate Studies Program to be delivered by our Department aims to provide to graduate students solid knowledge foundations and principles, which will enable them to continuously rise in a constantly changing working environment.

DEGREE AWARDED

The Graduate Studies Program under consideration awards the Degree of ***Master of Science (M.Sc.)*** in designing, developing & optimizing mechanical systems for the most efficient utilization of RE sources:

Master of Science (M.Sc.) in:

«Renewable Energy Systems: Design, Development and Optimization»

NUMBER OF ADMISSIONS

The number of students to participate in the Graduate Studies Program is set at ***twenty (20) per class***. The number of classes is determined by the

General Assembly of the M.Sc. Studies Program, depending on the number of the applicants. Selection is strictly based on the academic credentials of the applicants. On occasion, an interview may also be part of the selection process.

WHO CAN APPLY

The Graduate Studies Program in ***"Renewable Energy Systems: Design, Development and Optimization"*** is specifically addressing the needs of graduates holding a University Degree in fields related to RE sources (i.e., Polytechnics, Environmental or/and Natural Sciences, etc.), including also graduates from the related Departments of the Technological Education Institutes. Nevertheless, eligible for admission are also graduates of other disciplines with strong background in Mathematics or/and Physics. Senior students can also apply, provided they will have completed their studies before the beginning of the courses. ***Very good knowledge of the English Language is required***, since both lectures (including also the supporting material) & examinations of all courses are performed exclusively in English.

DURATION OF STUDY

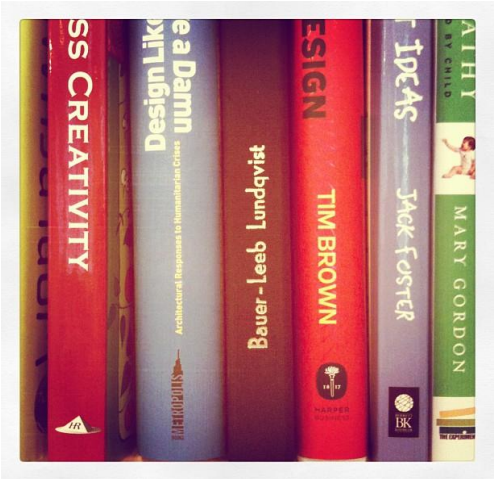
The M.Sc. Studies Program under consideration is delivered as a full-time study program. Studies last ***three semesters***, always starting in October of each year and ending in January of the year after the next. Lecturing is delivered during the first two semesters, spanning from October to June of each academic year, while the last (third) semester is intended for the execution of the Master's Thesis.

CONTENT OF STUDIES

The curriculum of the M.Sc. Studies Program is formed on the basis of all modern trends of science and research, related to the design, development and optimization of RE systems. It includes the following courses and tasks:

Foundation Courses: A total of eight (8) courses, assisting students to build all the background skills necessary for designing, developing and optimizing RE systems. Each foundation course carries ***six (6)*** European credit transfer system (ECTS) units (1 unit = 28 hours study, according to ECTS).

Specialization/Optional Courses: Two (2) [out of a total of five (5) offered] courses are chosen by the students, thus yielding their specialization to specific forms of RE sources. Each optional course carries (also) ***six (6)*** ECTS units.



Master's Thesis: To be completed by all students during the third (final) semester of their studies. The Master's dissertation corresponds to ***thirty (30)*** ECTS units.

- **The M.Sc. Degree is received after successful accumulation of ninety (90) ECTS units.**

The lecture part of each course is covered in ***thirteen (13) weeks***, the last one being reserved for the written evaluation. Classroom lectures of each course last ***three (3) hours per week***. Both teaching and examinations of all courses are performed exclusively in English.

A graduate student cannot flunk in more than ***one course*** per semester. In this case, the corresponding course is re-examined during the ***"2nd chance" examination period***, taking place at late August.

The detailed content of the curriculum for the acquisition of the M.Sc. Degree in ***"Renewable Energy Systems: Design, Development & Optimization"***, to be delivered by the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, is as follows:

FIRST SEMESTER

Code	Course Title	F/O	Lec	Lab	HpW	ECTS units
101	Applied Thermodynamics	F	3	0	3	6
102	Advanced Materials Science & Technology	F	3	0	3	6
103	Computational Mechanics	F	3	0	3	6
104	Engineering Economics & Cost Analysis	F	3	0	3	6
105	Advances in Heat Transfer	F	3	0	3	6
	Total		**15**	**0**	**15**	**30**

SECOND SEMESTER

Foundation Courses

Code	Course Title	F/O	Lec	Lab	HpW	ECTS units
201	Mechanical Engineering Design & Optimization	F	3	0	3	6
202	Computational Fluid Dynamics	F	3	0	3	6
203	Energy Conversion Systems	F	3	0	3	6

Optional Courses (two out of five)

Code	Course Title	F/O	Lec	Lab	HpW	ECTS units
E1	Aeolian (Wind) Energy Systems	O	3	0	3	6
E2	Solar Energy Systems	O	3	0	3	6
E3	Geothermal Energy Systems	O	3	0	3	6
E4	Modern Biomass Energy Systems	O	3	0	3	6
E5	Hydrogen Technology & Applications	O	3	0	3	6
	Total		**15**	**0**	**15**	**30**

THIRD SEMESTER

Code	Course Title	M	Lec	Lab	HpW	ECTS units
301	M.Sc. Diploma Thesis	M	-	-	-	30
	Total		**-**	**-**	**-**	**30**

Legend:
F: Foundation Courses
O: Optional Courses
Lec: Lectures
Lab: Laboratories
HpW: Hours per Week
M: Mandatory

MASTER'S THESIS

During the second semester, the students are expected to propose an outline for their M.Sc. Thesis dissertation and choose one of the available Thesis supervising Professors. The outline must identify the problem to be studied, the methodology to be followed and the literature to be used. The M.Sc. Thesis is worked out ***individually.***

TUITION FEES & FELLOWSHIPS

Tuition fees for the three semesters are **3,900 €** and they can be paid in three equal installments (1,300 € per semester). Each payment should take place at least ***ten (10) days*** before the beginning of the corresponding semester. Any possible adjustment of the fees must have the approval of the General Assembly of the Technological Education Institute of Central Macedonia.

Each semester ***fellowships are awarded to the top 10% of the students***, based exclusively on academic performance. As far as a number of twenty **(20)** participants is concerned, there is ***one full*** fellowship, waiving 100% of the tuition fees, and ***a partial*** fellowship, waiving 50% of the tuition fees.

APPLICATION

Applicants are expected to submit all necessary documents by **September 22, 2017**, to the Secretariat of the Program, either in person or by registered surface mail. The mailing address is:

Secretariat of the M.Sc. Program in:
"Renewable Energy Systems: Design, Development and Optimization",
Department of Mechanical Engineering,
Technological Education Institute of Central Macedonia,
62124 Serres, GREECE.

- **Applicants must also register electronically, through the website of the Program, by filling in the corresponding application form.**

Documents required:

1. Application Form (to be filled twice): The electronic version should be filled online, at http://engineering.teiser.gr, and its paper version should be included in the folder to be submitted, together with the documents listed below.

2. Curriculum Vitae.

3. Certified copy of the B.Sc. Degree.

4. Certified Transcripts.

5. Two Recommendation Letters.

6. Certified Knowledge of the English Language [First Certificate in English (FCE) of the University of Cambridge, Michigan Certificate of Competency in English (MCCE), IELTS (over 5.5), TOEFL (over 180) and TOEIC (over 505). Greek Citizens may also submit the (so called) «Ελληνικό Πιστοποιητικό Γλωσσομάθειας της Αγγλικής Γλώσσας», of level, at least, B2].

7. Copy of the undergraduate Diploma Thesis (if applicable to RE).

Submission of any other document, ***that could possibly support the application*** (e.g., scientific publications, awards, fellowship or employment certificates, etc.), is strongly encouraged.

- **All documents must be original or certified copies thereof (certified translations in English or Greek by the consular authorities).**

The names of all successful applicants will be announced at the website of the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, http://engineering.teiser.gr, by **October 2, 2017**.

- **The courses of the M.Sc. Studies Program in *"Renewable Energy Systems: Design, Development and Optimization"* will commence on *October 16, 2017 (for more information see the Academic Calendar).***

Further information is available at the website of the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, as well as through the Secretariat of the M.Sc. Studies Program:

Mr. Chris **KOULOGIANNIS**: **tel.**: +30-2321-0-49125, 49222
e-mail: mech_eng@teiser.gr

USEFUL LINKS

Please use the following links, to download:

- The M.Sc. Program **Course Guide** (in English).
- The M.Sc. Program **Course Outline** (in English)

- The **Academic Calendar** of the Third Session (in English)
- The **Weekly Schedule** of the Third Session (in English)
- The **Examinations Schedule** of the Third Session (in English)

- The **Application Form** (in English).

EPILOGUE

Facing a period of potentially transformative change, the Department of Mechanical Engineering of the Technological Education Institute of Central Macedonia, at Serres, Greece has a crucial role to play and an important calling: To demonstrate to our nation and the world that progress is possible against the great problems of today and tomorrow, such as energy and

climate, through the wise treatment of science and technology. In this context, further study on RE systems & processes is needed. We believe that, upon deliverance of the M.Sc. Studies Program in ***"Renewable Energy Systems: Design, Develop-ment and Optimization"***, we can set a path towards the future for RE expertise, and, building on our spirit, we can deliver the executives that will drive the next wave of economic growth.

The Director of the M.Sc. Studies Program,

Professor **Anastasios MOISSIADIS**