Degree Programme Guide for the Department of Materials Science & Technology

Organization and Structure of the Department

The Department of Materials Science & Technology (MST) was established in 1999 and started its undergraduate programme in the academic year 2001-2002, when it accepted its first 50 students. Its master's degree program started in the academic year 2003-2004. The Department is located at the University Campus at Vassilika Vouton, and has a close connection with the adjacent Foundation for Research and Technology – Hellas (FORTH), where its students can carry out research projects and theses.

The aim of the MST Department is to constitute a modern, innovative and dynamic center of excellence in an area that meets the needs of modern industry and economy. It also aims to participate in the current and future scientific and technological developments in the continuously and rapidly grown area of Materials Science.

The research activities of the Department focus on the development of new materials by understanding the composition-structure- processing-properties relationship of a material. To enforce and empower its research activities the Department, soon after its establishment, developed a well-organized graduate programme in the field of Materials Science and Technology. The graduate program leads to both Master's and PhD Degrees and its development and structure was based on the corresponding programs of other, previously established, Departments of the University of Crete, as well as Materials Science and Engineering international Departments worldwide.

Despite, its young age, the MST Department, has received already several distinctions, such as the highest number of papers and citations per member of faculty for the period 2006-2010 compared to the other Materials Science Departments in Greece (Figure 1), as well as other well-known Departments in Greece (Figure 2); this classification was concluded in a recent research/survey on the scientific output of Greek universities, and the data were obtained from the most authoritative international scientific data-base (Thomson Reuters ISI Web of Science) (http://www.materials.uoc.gr/el/general/awards.html [1]).

Contact information

Postal Address

Dept. of Materials Science and Technology

University of Crete

Vassilika Vouton

GR – 70013 Heraklion, Greece

E-Mail: secterariat@materials.uoc.gr [2]

Telephone +30 2810394270-2, +30 2810394462

Fax +30 2810394273

https://www.materials.uoc.gr/en [3]

Study Programme Overview

Undergraduate Studies Programme

Bachelor of Materials Science and Technology

Admission procedures

The enrollment in the Department of Materials Science and Technology of the University of Crete follows the rules set by the Ministry of Education and Religious Affairs which determine the enrollment of the students in the higher education institutions in Greece, or by qualifying exams.

Official Duration of Programme

8 academic semesters. Bachelor degree of 240 ECTS credits.

Attendance

Full-time study

Division – Specification

The undergraduate programme leads to a Bachelor of Science (B.Sc.) degree in Materials Science and Technology.

Requirements for Graduation

Completion of Undergraduate Degree Requirements:

1. Students must be enrolled in coursework required for their degree for at least eight (8) semesters.
2. Students must earn a total of 240 ECTS credits, of which at least 226 ECTS credits are from courses of the MST Department. The ECTS credits received from courses of other Departments are subject to the restrictions of Table I.
3. Successful completion of all core courses of the Department (listed in Table I), corresponding to 180 ECTS credits (8 ECTS credits from the English language studies and 174 from other courses).

The requirements for each student to receive his/her degree are those described in the Undergraduate Studies Guide that was in force during the year of first registration of the student in the Department. The course requirements for the Undergraduate Program are listed in Table I.

Table I: Requirements to receive the MST Department degree	
Courses	**ECTS**
Total	≥ 240
Total from the MST Department	**≥ 226**
Core courses:	**182**
From MST Department (other than English)	**174**
English	**8**
Core-Elective courses 1	**≥ 6**
Core-Elective courses 2	**≥ 18**
Elective courses	**≥ 34**
From MST Department	**≥ 20**
Philosophical/Pedagogical[1] Given by other Schools of the University	≤ 12
From other Departments of School of Sciences & Engineering and School of Medicine[1]	≤ 20
Practice[1]	≤ 10

[1]*The sum of ECTS credits from internship, philosophical-educational cycle courses, and courses from other departments must be less than or equal to 30.*

Course Classification

Course Classification	**Required Number of ECTS**
Core courses	182
Core – Elective courses 1 and 2	24 (EY1 = 6 ECTS, EY2 = 18 ECTS)
Elective courses, Philosophical/Pedagogical* (From other Departments of School of Sciences & Engineering* and School of Medicine*)	**≥34****

**Students must select 20 ECTS from the Department's elective courses. The remaining 14 ects can be completed from * or all other courses of the Department with maximum ECTS 12 from Pedagogical courses.

Educational, research and professional goals

Professional goals

Materials Science is a field with a very wide range of applications and, therefore, one can mention a series of companies/enterprises that can employ scientists with Bachelor's degree from a Materials Science and Technology Department. Such companies are those specializing, for example with metals (steel, aluminum), ceramics (tiles, insulation), glasses (optical fibers), polymers (plastics), electronic and optoelectronic materials (Microelectronics, Optoelectronics, batteries, cables, solar-cells, magnetic materials etc.), colloids (colors, chemicals), as well as with biomaterials and biocompatible materials (materials with applications in tissue engineering, implant, dental, prosthetic orthopedic, etc.).

The professional rights of the graduates of the MST Department, as foreseen by the presidential decree establishing the Department, were consolidated by the Presidential Decree 45/2009. According to that Presidential Decree:

The graduates of the Department of Materials Science and Technology of the Faculty of Sciences and Engineering of the University of Crete can be employed or self-employed to work on (indicatively):

1. research and development, production, standardization, quality control, certification and marketing of materials such as: (a) ceramics, polymers, glasses, metals, liquid-crystal materials, hybrid materials, construction materials, "smart" materials, (b) semiconductor materials, superconducting materials, magnetic materials, nanomaterials and nanostructures, optoelectronic materials, photonic materials, polymeric and more generally molecular materials used in electronics, optoelectronics and telecommunications, (c) biomaterials, biocompatible materials, materials of biological applications and other materials with applications in pharmaceuticals, dentistry and medicine. The above activities are considered both in laboratory and industrial scale and include synthesis, processing, characterization, modeling and simulation of materials,
2. in public and private organizations of energy production and telecommunications, and whenever the research and development of new advanced materials is essential for the progress of any activity of production and distribution of energy and telecommunications,
3. as scientists in organizations and services of the public sector and local government or private laboratories that have responsibility for official control/examination/testing/design and development of materials,
4. as scientists in organizations and services of the public sector and local government or private laboratories that undertake studies for the installation, inspection and certification of quality assurance systems and material accreditation laboratories,
5. as teachers in secondary education in private schools, public and private vocational training institutes (IEK) and vocational training centers (KEK), and other secondary and post-secondary education centers, to teach courses in Materials Science and Technology, but also other courses relevant to Materials Science,
6. as researchers on Materials Science in Universities, Technological Educational Institutes (TEI), research centers, research institutes, and enterprise research establishments and sections
7. as experts drafting technical reports and opinions in materials science.

Student Coursework Evaluation

There are three examination periods: for the winter semester (it is usually in January), for the spring semester (it is usually in June) and the September examination period. In January and in June the students can be examined only in the courses in which they were registered in the corresponding semester. In September (the so-called second exam period) they can be examined in all courses in which they were registered both previous semesters. Besides, the students have also the possibility to be examined in courses of previous years in which they had failed and have not registered in the current academic year if they submit to the Secretariat of the Department a “Request for course addition”, not later than July 20 of each year.

For laboratory courses, whether and under what conditions there will be a final exam is decided by the instructor and is announced to the students at the beginning of the course.

The specific examination procedures (e.g., final exam, mid-term exams, etc.) must be announced by the instructor at the beginning of each semester and within two weeks after the first lecture.

Re-examinations: Students who succeeded in a course in the first examination periods (January or June) and want to increase their grade in a particular course can participate in the second examination period (September) of the same academic year if they declare this intention to the secretariat by July 20 of each year. In this case the grade assigned is the highest among the two.

In case the student re-registers for the same course in another academic semester, then his/her first grade is deleted and the grade assigned is the last one.

Grading system and requirements for students’ graduation

The grading system is characterized as follows:

Excellent: from 8,50 to 10.

Very good: from 6,50 to 8,49

Good: from 5 to 6,49

Minimum passing grade is 5

Grade less than 5 in the individual courses indicates failure.

Degrees

Bachelor degree (B.Sc.) in Materials Science and Technology

Professional certificate

The professional rights of the graduates of the MST Department, as foreseen by the presidential decree establishing the Department, were consolidated by the Presidential Decree 45/2009.

Access to further studies

Graduates of the Department have access to postgraduate studies for obtaining a Master Degree or a PhD, following the requirements set by the host Department.

Indicative Curriculum

1st Semester		ECTS	2nd Semester		ECTS
101	General Physics I	6	102	General Physics II	6
111	General Mathematics I	6	112	General Mathematics II	6
121	General Chemistry	6	116	Applied Mathematics	6
141	Materials I: Introduction to Materials Science	6	122	Organic Chemistry	6
011	English I	4	124	Chemistry Laboratory Course	8
114	Computers I: Introduction to programming	6	012	English II	4
Total ECTS		**34**		***Total ECTS***	**36**
3rd Semester		**ECTS**	**4th Semester**		**ECTS**
201	Modern Physics I: Introduction to Quantum Mechanics	6	204	Physics Laboratory II: Electricity-Optics	8
223	Inorganic Chemistry	6	232	Biochemistry and Molecular Biology	6
225	Laboratory Course: Materials Chemistry	8	243	Materials II: Polymers-Colloids	6
203	Physics Laboratory I: Mechanics-Heat	8	242	Materials III: Microelectronic and Optoelectronic Materials	6
211	Differential. Equations I	6			
260	Thermodynamics	6		Core-Elective course 1	6

Total ECTS		**40**		***Total ECTS***	**32**
5th Semester		**ECTS**	**6th Semester**		**ECTS**
301	Electromagnetism	6	362	Materials V: Ceramic and Magnetic Materials	6
305	Solid State Physics: An Introduction	6	344	Laboratory Course: Solid Materials	8
335	Molecular Cell Biochemistry	6	PRAC-001	Practice I	5
343	Laboratory Course: Soft Materials	8		Elective Courses	15
391	Materials IV: Science of Natural Biomaterials	6			

Total ECTS		**32**	***Total ECTS***		**34**
7th Semester		**ECTS**	**8th Semester**		**ECTS**
***	Core-Elective course or Elective Course	16		Core-Elective course or Elective Course	16
	Total ECTS	**16**		***Total ECTS***	**16**

Student mobility

ERASMUS Project Coordinator:

Associate Professor Pavlos Savvidis

Phone: 2810 394115

Fax: 2810 394106
e-mail: psav@materials.uoc.gr [4]

Deputy ERASMUS Project Coordinator:

Assistant Professor Maria Chatzinikolaidou

Phone: 2810 394276

Fax: 2810 394273
e-mail: mchatzin@materials.uoc.gr [5]

Participating Institutions:

The institutions which students have the possibility to visit in the framework of the Erasmus program are listed in the web-site http://www.uoc.gr/intrel/cat_1_1_12.htm [6]

Detailed and updated information about the Erasmus program can be found at the web-site http://www.uoc.gr/intrel/cat_1_2_1.htm [7]

Criteria to participate to the Erasmus project

The criteria to be met by the students of the MST for participation in the Erasmus programme are the following:

1. Registered in the 3rd or higher year of their studies.
2. Significant progress in their studies, having succeeded in most of the core courses, in order to be able to fulfill the requirements of the host University.
3. Have a Progress index in the top 20% of the students of their year.

Internships

After the end of the fourth semester, preferably during the summer vacation period, students can perform an internship in Greek, and international organizations and companies, of the public or the private sector with the aim of getting working or research expertise in materials science and related technological applications. The duration of the internship is typically 2 months with the possibility of extension in cases where the internship is preformed outside Greece. The Internship Committee of the department is responsible for approving proposed internships and corresponding the interested parties (student and company/organization). After the end of the internship the student should submit an “activity report”, which will be assessed by the Internship Committee, which will then decide on the final grade and ECTS credits (up to 5 ECTS credits per internship, with a maximum of 2 internships in total). In this way students can get up 10 ECTS credits. The ECTS credits achieved from the Internship belong to the category of ECTS credits from other Departments of the Universities, which can be up to 30.

Financing and other opportunities for Undergraduate students

There is no foreseen procedure by the Department, but by other institutions such as IKY, bequests etc.

Links
[1] http://www.microsofttranslator.com/bv.aspx?from=el&to=en&a=http%3A%2F%2Fwww.materials.uoc.gr%2Fel%2Fgeneral%2Fawards.html
[2] mailto:secterariat@materials.uoc.gr

[3] https://www.materials.uoc.gr/en/general/personnel/whitepages.html
[4] mailto:psav@materials.uoc.gr
[5] mailto:mchatzin@materials.uoc.gr
[6] http://www.uoc.gr/intrel/cat_1_1_12.htm
[7] http://www.uoc.gr/intrel/cat_1_2_1.htm