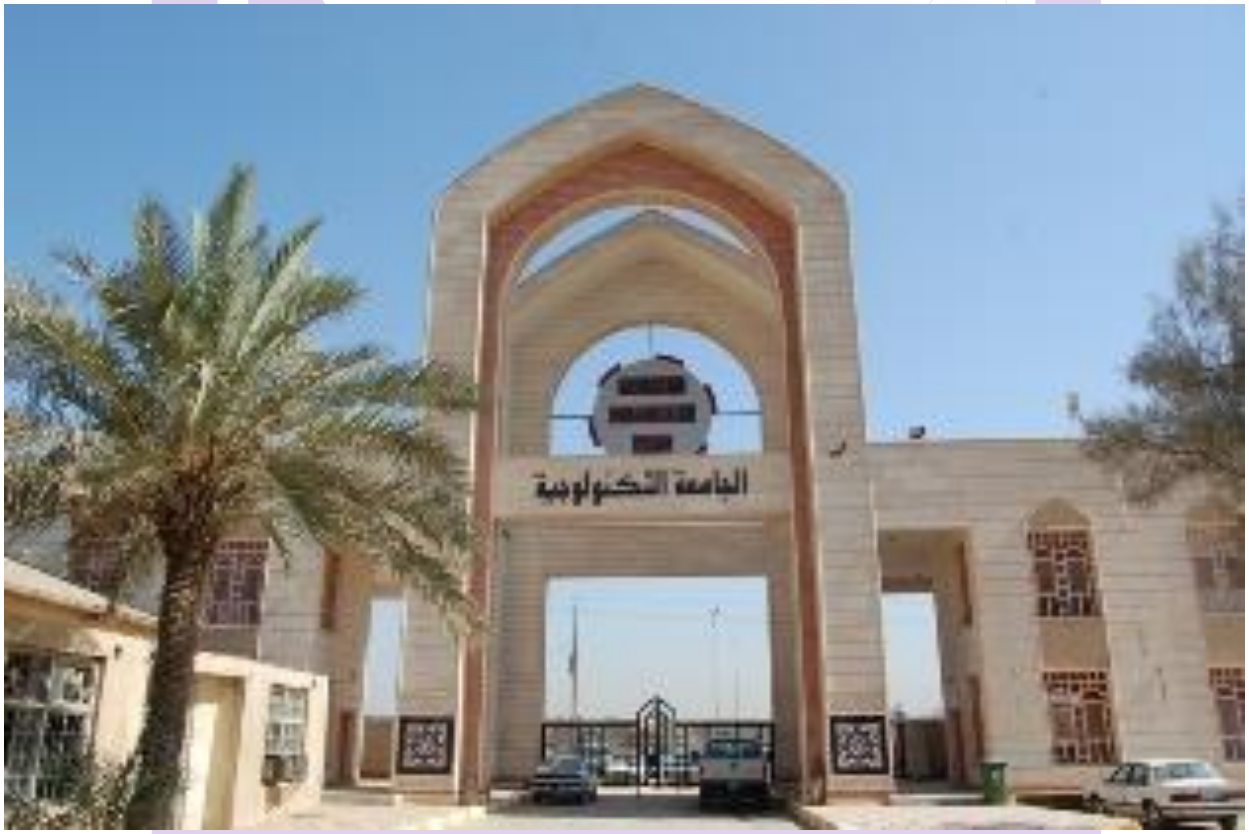
University of Technology

الجامعة التكنولوجية

First Cycle – Bachelor's degree (B.Sc.) – General MaterialsEngineering

بكالوريوس هندسة المواد العام



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1. Mission & Vision Statement

Vision Statement

The General Materials Engineering Branch should be distinguished and creative in the field of specialization. As well as contribute to understanding the nature of the work of discovery, analysis**,** and characterization in this area. And follow up**on**the rapid developments in the field of engineering materials and applications in various fields in accordance with the curriculum of the branch and to graduate cadres qualified and efficient in the field of engineering materials.

Mission Statement

The mission of the branch is to prepare specialized engineering personnel in the general materials engineering branch (metals, polymers, ceramics, and composite materials) to suit the requirements of the field of work in all scientific and educational aspects, and at the levels of undergraduate (B.Sc.) and graduate studies (M.Sc. and Ph.D.).

2. Program Specification

Program code:	BSc-MaEG	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Materials engineering involves, on the basis of structure–property correlations, designing or engineering the structure of a material to produce a predetermined set of properties. From a

functional perspective, the role of a materials Engineer is to develop or synthesize new materials, create new products or systems using existing materials and/or to develop techniques for processing materials. Most graduates in materials programs are trained to be both materials scientists and materials engineers. All students have the opportunity to transfer onto our specialist degrees in General Materials Engineering, Ceramic and Building Materials Engineering, Polymeric and Petrochemical Materials Engineering, and Biomaterials Engineering and Prosthesis at the end of the second year.

Level 1 and 2 exposes students to the fundamentals of Materials Engineering, suitable for progression to all programs within the Engineering program group. Program-specific core topics are covered at Levels 3 and 4 preparing for research-led subject specialist modules at Level 4. A graduate from all the branches of the Materials Engineering Department is therefore trained to appreciate how research informs teaching, according to the University and School Mission statements.

At Levels 3 and 4 in the General Materials Engineering program, students are free to choose more than half of their module credits focusing on General Materials, through Composite Materials, Selection of Engineering Materials, Design of Materials Engineering, Casting Technology, and use of math and science in solving all the engineering problems related with this specification, to ensure the breadth of knowledge expected from a graduate with a B.Sc. degree in the General Materials Engineering. This allows students to develop their own wide-ranging interests in Materials Engineering. Decisions on what to study are made with input from personal tutors

The research ethos is developed and fostered from the start via practical's, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory practical module (6 hrs.) in Level 1, which is a workshop (WORK107) that students must pass in order to progress into Level 2. In Levels 2 there is also practical hours (4 hrs.) embedded within (MAPR211) and (MAPR221) modules. At Level 4 all students carry out an independent research project, which is (2hrs.) Class lecture and (4 hrs.) practical student workload.

Academic tutorials are held at Levels 1, 2,3, and 4 with the same tutor, who is also the personal tutor, providing continuity and progressive guidance. Tutorials include a number of presentation skills, followed by assessed exercises, e.g., essays and talks, as opportunities to practice these skills in a subject-specific context.

International years and Industrial placements are also offered, and individual needs are discussed with the appropriate tutor and accommodated wherever possible.

3. Program Goals

The academic program is focused on the following objectives:

1- Graduation of engineers capable of understanding the types of materials, their characteristics, their manufacture, and performance in various engineering and industrial applications, which in turn enables them to develop industries and set national standards and specifications to ensure the quality of the product.
2- Insurance the country's need for material engineers to develop solutions to engineering problems related to engineering materials.

3- Upgrading the scientific level of the graduates of the branch to encounter challenges of rapid development in most of the engineering sciences, including design, analysis, selection, and characterization.

4. Student Learning Outcomes

Materials Engineering/General Material Engineering is the study of all Materials classification and processes in general and then specializes at levels 3& 4 in Metallic materials, selection, manufacturing, and recycling. Graduates obtain information on the historical, technical, and social aspects of General Material Engineering and utilize basic knowledge to realize broader concepts. The Department offers a Bachelor of Science in general Material Engineering, additionally, the Department offers courses to many students from other departments and supports pre-professional programs.

Outcome 1

Identification of Complex Relationships

An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.

Outcome 2

Engineering Design

An ability to produce engineering designs that meet desired needs within certain constraints by applying both analysis and synthesis in the design process.

Outcome 3

Oral and Written Communication

An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.

Outcome 4

Laboratory and Field Studies

An ability to create and carry out proper measurements and tests with quality assurance, analyze and interpret results, and utilize engineering judgment to make inferences.

Outcome 5

Scientific Knowledge and Ethics

An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the consequences in worldwide financial, ecological and societal considerations.

Outcome 6

Data Analyses

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to conductsimple data analyses, and also perceive the continual necessity for professional knowledge growth and how to find, assess, assemble, and apply it properly.

Outcome 7

Critical Thinking and Teamwork

Graduates will be able to use critical thinking and problem-solving skills to develop a research project and/or paper. Also, the graduate should have the ability to work adequately on teams and to set up objectives, plan activities, meet due dates, and manage risk and uncertainty.

5. Academic Staff

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6. Credits, Grading, and GPA

Credits

The University of Technology is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs. student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number of Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program's total ECTS.

   CGPA of a 4-year B.Sc. degree:

   CGPA = [(1st ^{m}odule score x ECTS) + (2nd ^{m}odule score x ECTS) + ……] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
STMA111	Structure of Materials	63	62	5.00	C	
ENDW112	Engineering Drawing	78	47	5.00	B	
MATH113	Mathematics-I	48	77	5.00	B	
ENMS114	Engineering Mechanics/Static	48	52	4.00	B	
DEHR105	Democracy and Human Rights	33	17	2.00	S	
WSHE106	Workshop	90	10	4.00	B	
ENLA107	English Language	33	17	2.00	S	
MACH118	Materials Chemistry	63	12	3.00	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PRMA121	Properties of Materials	63	87	6.00	C	
MEDW122	Mechanical Drawing	78	47	5.00	B	
MATH123	Mathematics- II	48	77	5.00	B	
ENMD124	Engineering Mechanics/Dynamic	48	52	4.00	B	
MAPH125	Materials Physics	33	42	3.00	B	
WSHE106	Workshop	90	10	4.00	B	
COMP108	Computer	48	27	3.00	S	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PRMP211	Principles of Manufacturing Processes	78	47	5.00	C	
MEEN212	Metallurigical Engineering	78	47	5.00	C	
CEEN213	Ceramic Engineering	33	92	5.00	C	
THER214	Thermodynamics	63	62	5.00	B	
STMA215	Strength of Materials- I	78	22	4.00	B	
APMA216	Applied Mathematics- I	48	52	4.00	B	
CBRI201	Crimes of the Baath Regime in Iraq	33	17	2.00	S	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MAPR221	Manufacturing Processes	78	47	5.00	C	
POEN222	Polymer Engineering	33	92	5.00	C	
INBI223	Introduction to Biomaterials	33	92	5.00	C	
HETR224	Heat Transfer	78	22	4.00	B	
STMA225	Strength of Materials- II	78	22	4.00	B	
APMA226	Applied Mathematics- II	48	52	4.00	B	
PRLA227	Programming Language	63	12	3.00	S	

8. Contact

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