Program Catalogue | 2023-2024 |

University of Al-Shatrah

First Cycle – Bachelor's Degree (B.Sc.) – Engineering Materials

1. Overview

The materials engineering department was established in 1999-2000 to meet the emerging needs of the governmental and private sector agencies and companies for skilled materials engineers and to keep abreast of the scientific and technical progress in the world.

Since its inauguration, ME department adopted a well- established academic program equal to the materials engineering departments worldwide by focusing on both theoretical and practical integrated aspects of the materials engineering field of study.

The undergraduate study at the department is four years in length; from the moment of receiving the fresh first year students whose average grades qualify them to join up until the graduation of the senior final year students where they get their Bachelor of Science degree in the materials engineering.

In 2022-2023, the department has established a postgraduate studies course

The material engineering departments constitutes of:

1. The **Head** of the department who manages the department's administrative and academic affairs, the **Head's** administrative supporting staff includes (secretary, assistants, and clerical members of the staff).
2. The **department panel** includes all the faculty members of the department .

This catalogue is about the courses (modules) given by the program of Communication Engineering to gain the Bachelor of Science degree. The program delivers (44) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

Program Specification

Programme code:	BSc-Materials Engineering	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Materials science is a wonderfully wide-ranging subject. The focus of the program is on everything related to the materials, whether it is the composition of the materials, extractions, and its production methods. The degree is popular - –or some it's' the breadth of the subject that appeals, for others it's' a path to specialization. All students have the opportunity to transfer onto our specialist degrees in materials, at the end of the first year.

Level 1 exposes students to the fundamentals of materials, suitable for progression to all programme within the materials programme group. Programme-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. A Leeds materials graduate is therefore trained to appreciate how research informs teaching, according to the University Mission statements.

At Levels 2, 3 and 4 students are free to choose more than half of their module credits with the proviso a range of modules are selected that reflect the complexity of materials engineering to ensure the breadth of knowledge expected of a graduate with a materials degree. 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 practicals, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out an independent research project.

Academic tutorials are held at Levels 1 and 2 with the same tutor, who is also the personal tutor, providing continuity and progressive guidance. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. library use and 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

Goals

1- To provide a comprehensive education in materials that stresses scientific reasoning and problem solving across the spectrum of disciplines within materials engineering.

2- To prepare students for a wide variety of post-baccalaureate paths, including graduate school, professional training programs, or entry level jobs in any area of materials engineering.

3- To provide extensive hands-on training in electronic technology, statistical analysis, laboratory skills, and field techniques

4- To provide thorough training in written and oral communication of scientific information

5- To enrich students with opportunities for alternative education in the area of materials engineering through undergraduate research, internships, and study-abroad.

Outcomes

The main objective of the program outcomes, POs, and the program Educational Objectives, PEOs, is to measure the level of achievement of the curriculum requirement of the department in preparing the graduates to meet the challenges presented to them by the fascinating computer industry. In other words, the computer engineering Program outcomes, POs, and Program Educational Objectives, PEOs, are two different, but interrelated mechanisms that were developed in order to measure the level of achievement and success of the program.

The COE department has developed ten Program Outcomes (POs) as an initial set of POs. These outcomes are, in effect, what the students expected to know and achieve post graduation. **Table2.4** shows these program outcomes.

Table2.4: Materials Engineering Program Outcomes

Symbol	Description
A	**PO1:** ability to apply knowledge of mathematics, science, and engineering fundamentals
B	**PO2:** ability to design and conduct experiments as well as analyze and interpret data
C	**PO3:** ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
D	**PO4:** ability to function on multi-disciplinary teams
E	**PO5:** ability to identify, evaluate and solve engineering problems
F	**PO6:** understanding of professional and ethical responsibilities
G	**PO7:** ability to communicate effectively
H	**PO8:** ability to understand the impact of engineering solutions in a global, economic, environmental, and societal context
I	**PO9:** recognition of the need for, and an ability to engage in life-long learning
J	**PO10:** knowledge of contemporary issues related to engineering.
K	**PO11:** ability to use the techniques, skills, and modern engineering tools necessary for the engineering practice.

Departmental Committees

Committee Name	Responsibilities
Scientific and Graduate Affairs Committee	- Make decisions and statements. - Issue graduation transcripts. - Develop the curricula.
Examination Committee	- Manage the examination process in each semester as well as the final exams. - Document the students' records, marks, and grades.
Imports Committee	- Determine what the department needs at the beginning of each academic year.
Inventory Committee	- Count and calculate prices of everything in the department and where everything has been moved to/from.
Gratis Books Committee	- Giving the students as well as faculty members the needed textbooks at the beginning of each academic year.
Summer Industrial Training Committee	- Assigning students to their designated summer training governmental companies.
Laboratories Maintenance Committee	- Maintain the healthy environment of laboratories.
Quality Assurance Committee	- Responsible for preparing reports, communicating the quality assurance requirements to the department.
Local Shopping Committee	

Credits, Grading and GPA

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 total ECTS.

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

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

Course code is presented according to three requirements:

1- University requirement started by the letter U

2- Engineering College requirement is started by the letter E

3- Department Requirement (Materials Engineering) is started by the letters MAE

Course code started by capital letters followed by number of 3-digits as following:

1st digit represents the class number

2nd digit represent the semester number, 1: 1st Semester, 2: 2nd Semester,…, 0: Yearly

3rd digit represent the subject number

For examples:

Example: U112 represents University requirements, first year, first semester, and second subject.

Example: MAE212 represents Department Requirements, second year, first semester, and second subject.

Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Calculus (I)	62	63	5	B	
Computer Science	62	38	4	B	
Applied Sciences	62	63	5	B	
Engineering Mechanics / Static	62	88	6	B	
English / Technical	32	43	3	B	
Prenciple of Engineering materials	62	63	5	C	
Human Rights and Democracy Concepts	33	17	2	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Mathematics (II)	62	63	5	B	
Engineering Mechanics / Dynamic	62	88	6	B	
Materials Extraction Technology	47	78	5	C	
Engineering Drawing	47	53	4	B	
prenciple of Electical Engineering	62	38	4	B	
English Languge	33	17	2	B	

Basics of Matlab	62	38	4	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Applied Mathematics (I)	63	87	6	B	
Strength of Materials	93	57	6	B	
Thermodynamics	93	57	6	B	
Engineering Metallurgy	63	87	6	C	
Crimes of Al-Baath	33	18	2	B	
Mechanical Drawing	48	52	4	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Applied Mathematics (II)	63	87	6	B	
Engineering workshops	78	22	6	B	
Fluid Mechanics	93	57	6	B	
Strength of Materials	93	57	6	C	
Biomaterials Technology	62	88	2	B	
Arabic	33	17	4	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Engineering Analysis	77	48	6	5	B

Behavior of Engineering Materials (I)	77	48	6	5	C
Heat Treatments	77	48	6	5	C
Corrosion (I)	92	58	6	6	C
Heat Transfer	77	48	6	5	B
Wellding and cutting	62	38		4	C

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Numerical Analysis	77	48	6	5	B
Behavior of Engineering Materials (II)	77	48	6	5	C
Ceramic Materials	77	48	6	5	C
Corrosion (II)	92	58	6	6	C
Polymers Engineering	77	48	6	5	C
CAD\ CAM	62	38		4	C

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Mechanical Design	92	58	6	B	
Non-Destructive Testing	92	58	6	C	
Powder Metallurgy	77	48	5	C	
Composite Materials	77	48	5	C	
Engineering Project	77	23	4	B	

Strees analysis and plasticity	47	53	4	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Module	SSWL	USSWL	ECTS	Type	Pre-request
Selection of Engineering Materials	107	68	7	C	
X-Ray Diffraction and Microscopy	107	68	7	C	
Advance and Nano Materials	92	58	6	C	
Project Management	92	58	6	B	
Engineering Project	62	38	4	B	

Contact

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