



Budapest Tech



Czech Technical University in Prague



Faculty of Engineering
Assiut University

INTERNAL REGULATIONS FOR THE BACHELOR OF SCIENCE DEGREE IN MECHATRONICS AND ROBOTICS ENGINEERING

- Assiut University awards at the request of the Faculty of Engineering council the Bachelor Degree (**B.Sc.**) in the specialization of ***Mechatronics and Robotics Engineering*** as a new multidisciplinary educational program where students have to cover the predetermined tuition fees, which can be increased annually by 10% upon approval by the Higher Administrative Committee of the program.
- The freshmen apply for enrollment directly after getting the secondary school certificate according to the rules of the Universities Supreme Council.
- The program can accept graduates of the Faculty of Computers and Information subject to a special enrollment system approved by the Academic Executive Committee, Faculty council and the Higher Administrative Council to give those graduates the chance to improve their working environment to satisfy the market real need.

Mission of Mechatronics and Robotics Engineering Program:

- ◆ To provide a high- quality, effective and efficient learning environment for its students, which is up to international standards.
- ◆ To prepare future engineers who are able to perform multiple tasks efficiently.
- ◆ To prepare creative engineers who can designs manufacture, manage and operate intelligent machines in the professional fields of industry and economy.
- ◆ To prepare future multidisciplinary engineers to meet the demands for an engineering workforce equipped with information technology embedded systems and precision mechanical systems.
- ◆ To provide the students with multidisciplinary capabilities to design products and intelligent equipment by integrating mechanical, electronics and information technology.
- ◆ To prepare qualified students who can apply latest manufacturing techniques to improve products quality and enhance the system performance.
- ◆ To improve the student's practical skills.

Educational Objectives:

The program aims to graduate students who are:

- ◆ Able to design, analyze, and test intelligent products or systems that incorporate and integrate suitable, sensors, actuators and controllers.
- ◆ Able to use engineering tools that will enhance the productivity and the process of design.
- ◆ Capable of effective oral, written, and graphical communication.
- ◆ Able to function effectively as members of multi-disciplinary teams and problem solvers.
- ◆ Prepared for a variety of engineering careers, graduate studies, and continuing education.
- ◆ Able to follow up graduate programs of higher studies leading to Diploma, M.SC. and Ph.D.
- ◆ Able to lead a research team in R&D industrial centres.

ACADEMIC PLAN

The minimum number of credit hours required for obtaining the Bachelor Engineering Degree is 180 credit hours. These are classified as follows:

- 1 - University Requirements: (18 Credit Hours)
 - Compulsory Course : (2 Credit Hours)
 - Elective Courses : (16 Credit Hours)
- 2 - Faculty Requirements : (44 Credit Hours compulsory courses)
- 3 - Departmental Requirement: (56 Credit Hours)
 - Compulsory Course : (48 Credit Hours)
 - Elective Courses : (8 Credit Hours)
- 4 - Major Requirement: (62 Credit Hours)
 - Compulsory Course : (52 Credit Hours)
 - Elective Courses : (10 Credit Hours)

1- University Requirements (Humanities Courses)

The university requirements is realized by studying nine courses in humanities (2 credits each) of 18 credit hours, which represent 10 % of the total credit hours and include English language, seminars, technical report writing, environment protection, risk management, project management...etc.

A] Obligatory Course:

HUM 0111- English Language

B] Elective Courses:

Students have to select eight courses each of two credits with a total of 16 credit hours.

HUM 0202 - Environment Protection

HUM 0203 - Human Rights

HUM 0304 - Seminar in Progress of Engineering Technologies

HUM 0305 - Seminar in History of Engineering & Technology

HUM 0406 - Technical Report Writing and Presentation Skills

HUM 0407 - Technical English Language

HUM 0508 - Engineering Economy

HUM 0509 - Ethics for Engineering Profession

HUM 06010 - Industrial Safety

HUM 06011 - Alarms and Fire Protection Systems

HUM 08012 - Risk Management

HUM 08013 - Professional Skills and Marketing

HUM 09014 - Cost Accounting and Feasibility Study

HUM 09015 - Accounting and Costs

HUM 10016 - Project Management

2- Faculty Requirements :

The faculty requirements includes (A) basic sciences courses and (B) basic engineering courses with a total of 44 credit hours which represents 24.44 % of the total credit hours.

Obligatory Courses:

A] Basic Sciences:

The weight of the basic sciences courses is equivalent to 23 credit hours, which represents 12.77 % of the total credits.

MATH 0111- Mathematics (1) - 3 Cr
MATH 0212- Mathematics (2) - 3 Cr
MATH 0313 - Mathematics (3) - 3 Cr
PHY 0111 - Physics (1) - 3 Cr
PHY 0212 - Physics (2) - 3 Cr
CHEM0211 - Engineering Chemistry - 3 Cr
ME 0111 -Engineering Mechanics (1) - 3Cr
ME 0214 - Engineering Mechanics (2) – 2 Cr

B] Basic Engineering Sciences:

The weight of the basic engineering courses is equivalent to 21 credit hours, which represents 18.33 % of the total credits.

ME 0112- Computer Aided Engineering Drawing (1) - 3 Cr
ME 0215- Computer Aided Engineering Drawing (2) - 2 Cr
ME 0113- Fundamentals of Manufacturing Engineering (1) – 2 Cr
ME 0216- Fundamentals of Manufacturing Engineering (2) – 3 Cr
MP 0411- Thermo-fluid Engineering - 3 Cr
EC 0111- Computer Programming (1) - 2 Cr
EC 0413- Computer Programming (2) - 3 Cr
EE 0311- Electric Circuits - 3 Cr

3- Departmental Requirements:

The weight of the applied engineering courses in mechanical and electrical engineering disciplines is equivalent to 56 credit hours which are distributed as 48 credit hours of obligatory courses and 8 credit hours as elective courses. The departmental requirement represents 31.11 % of the total credits.

Obligatory Courses:

ME 0317- Engineering Materials and Properties – 3 Cr
ME 0518- Numerical Analysis - 2 Cr

MP 0512- Engineering Thermodynamics- 2 Cr
MP 0513- Fluid Mechanics - 3 Cr
MP 0614- Measurement and Instrumentation - 3 Cr

MDP 0311- Production Engineering - 3 Cr
MDP 0312- Machine Construction - 2 Cr
MDP 0413 - Mechanics of Machines - 3 Cr

MDP 0414 - Stress Analysis - 3 Cr
MDP 0515- Mechanical Vibrations - 2 Cr
MDP 0516- Mechanical Design (1) - 2 Cr
MDP 0617- Mechanical Design (2) – 3 Cr

EE 0412- Electronics - 4 Cr
EE 0513- Electronic Circuits – 3 Cr
EE 0614- Digital Design - 3 Cr
EE 0715- Electrical Actuators - 4 Cr
EE 0816- Industrial Electronics – 3 Cr

Elective Courses:

Students have to select 3 courses with a total of 8 credit hours.

EC 0302- Introduction to Information Technology – 2 Cr
EC 0303- Computer Technology – 2 Cr

MP 0705- Air Conditioning Systems – 3 Cr
MP 0706- Renewable Energy - 3 Cr

MDP0908- CNC Machines - 3 Cr
MDP0909- Non conventional Machining - 3 Cr

4] Major Mechatronics and Robotics Requirements:

The weight of the major courses in **MTR** is equivalent to 62 credit hours, which represents 34.44 % of the total credits, which are distributed as 52 credit hours of obligatory courses and 10 credit hours as elective courses.

Obligatory Courses:

MTR 0613- Fluid Power Systems -3 Cr
MTR 0614- Introduction to Robotics - 2 Cr
MTR 0717- Electro hydraulic Servo systems – 3 Cr
MTR 0718- Transducers *Credit 3*
MTR 0719- Automatic Control (1) - 3 Cr
MTR 08112- Mechatronics Project - 2 Cr
MTR 08113- Introduction to Mechatronics - 3 Cr
MTR 08114- Robotics - 3 Cr
MTR 09115- Automatic Control (2) – 3 Cr
MTR 09116- Mechatronics Laboratory (1) - 2 Cr
MTR 091170- Mechatronics Graduation Project - 6 Cr (3x2)
MTR 10118- Mechatronics Laboratory (2) – 2 Cr
MTR 10119- Mechatronics System Design - 4 Cr
MTR 10120- Robotics and Automation - 2 Cr
MTR 10121- Process control - 3 Cr

EC 0814- Programmable Logic Controller (PLC) – 3 Cr
EC 0917- Embedded Systems – 3 Cr
EC 0918- Digital Control – 2 Cr

Elective Courses:

Students have to select 5 courses of two credit hours each with a total of 10 credit hours.

MTR 0501- Seminar in Mechatronics and Robotics (1)
MTR 0502- Seminar in Robotics

MTR 0605- Modeling and Simulation of Dynamic Systems:
MTR 0606- Design of Fluid Power Systems applying Automation Studio Software
MTR 07010- Seminar in Mechatronics and Robotics (2)
MTR 07011- Seminar in Medical Mechatronics

EC 0805- Fuzzy Systems:
EC 0806- Neural Networks
EC 1009- SCADA Systems and Automation
EC 10010- Expert Systems