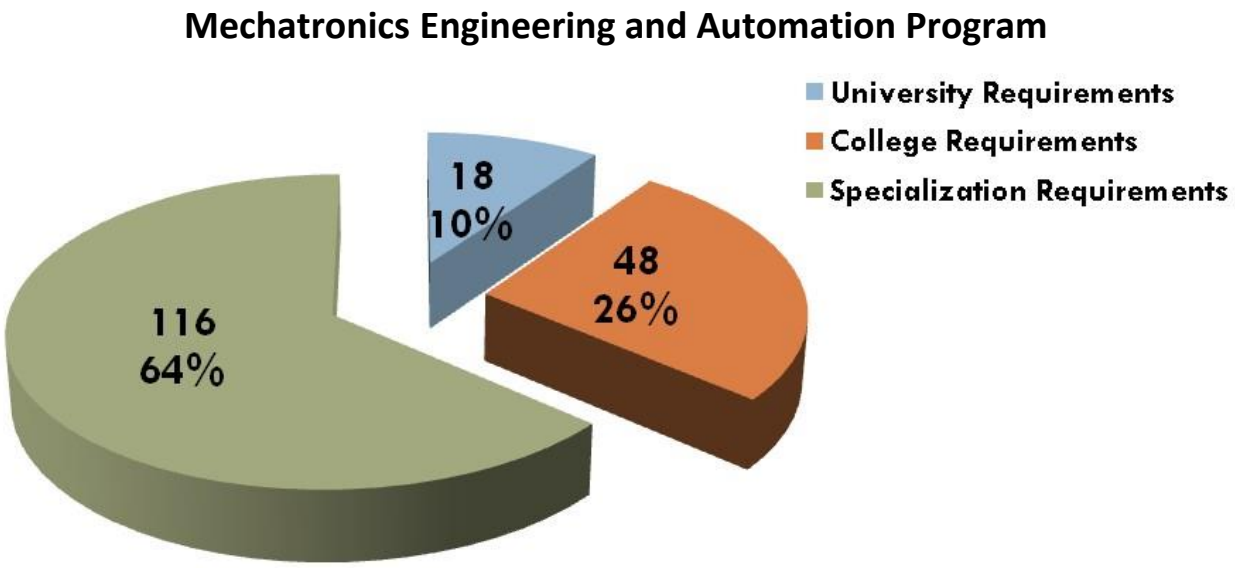


## Mechatronics Engineering and Automation Program Mission and Goals

### Program Mission

The program's mission is to provide high quality education in the field of mechatronics and automation, that support all mechatronics's students in attainment their full potential to; compete in the local and regional market, deal with the latest developments in the field of mechatronics and automation system, conduct valuable research and apply ethical standards and environmental considerations during implementing industrial and engineering projects. That enabling them to deal with the real problems in this field and provide specialized services for the community which will improve the environment. This is done by creating the appropriate atmosphere supportive of the sustainable development of the faculty members' skills, students' skills, knowledge and attitudes essential for life-long learning and cooperating with competent industrial and research bodies locally and internationally.

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## University Requirements

The student will study (6) General Education Elective Courses (humanities) selected by him from the following list of courses, with a total of (18) credit hours.

| Course Code | Course Title | Credit Hours |
|---|---|---|
| HUM 011 | English Language | 0 |
| HUM 012 | German Language | 3 |
| HUM 013 | Technical Writing and Communication | 3 |
| HUM 014 | Engineering Profession, Practice, and Responsibilities | 3 |
| HUM 111 | Engineering Economy | 3 |
| HUM 112 | Health and Wellness | 3 |
| HUM 211 | Impact of Technology on Society | 3 |
| HUM 212 | Introduction to Marketing | 3 |
| HUM 311 | Engineering Management | 3 |
| HUM 312 | Human Resource Management | 3 |
| HUM 313 | Engineering Law | 3 |

## College Requirements

### Basic Science Courses

Student must study the following list of courses as basic science requirements:

| Course Code | Course Title | Credit Hours |
|---|---|---|
| PHM 012 | Calculus for Engineering (1) | 3 |
| PHM 013 | Calculus for Engineering (2) | 3 |
| PHM 014 | Linear Algebra and Analytical Geometry | 3 |
| PHM 022 | Waves, Electricity, and Magnetic Fields | 3 |
| PHM 032 | Engineering Mechanics (1) - Statics | 3 |
| PHM 033 | Engineering Mechanics (2) - Dynamics | 3 |
| PHM 042 | General Chemistry | 3 |
| PHM 113 | Calculus for Engineering (3) | 3 |
| PHM 114 | Statistics and Probability for Engineering | 3 |
| PHM 115 | Differential Equations and Partial Differential Equations | 3 |

### Basic Engineering Courses

Student must study the following list of courses as Basic Engineering requirements:

| Course Code | Course Title | Credit Hours |
|---|---|---|
| CSE 012 | Engineering Computation | 3 |
| MDP 024 | Production Engineering | 3 |
| MDP 061 | Engineering Design and Graphics | 4 |
| MEP 112 | Thermodynamics | 3 |
| MDP 132 | Structures and Properties of Materials | 3 |

# General Specialization Courses for Mechtronics Engineering and Automation Program

| Course Code | Course Title | Credit Hours |
|---|---|---|
| EPM 114 | Electrical Circuits | 3 |
| CSE 115 | Digital Design | 3 |
| MDP 121 | Manufacturing Technology (1) | 3 |
| CSE 122 | Computer Programming | 3 |
| ECE 142 | Electronic Circuits | 3 |
| MCT 151 | Introduction to Mechatronics | 2 |
| MDP 151 | Stress Analysis | 3 |
| MDP 163 | Machine Drawing and Solid Modeling | 3 |
| EPM 214 | Electrical Power Engineering | 3 |
| CSE 228 | Advanced Computer Programming | 3 |
| MEP 233 | Fluid Mechanics | 3 |
| MCT 241 | Engineering Measurements | 3 |
| MCT 242 | Electronic Instrumentation | 3 |
| MCT 251 | Theory of Machine and Multi-body | 3 |
| ECE 255 | Signals and Systems | 3 |
| MDP 261 | Machine Design | 3 |
| MDP 267 | Machine Elements Design | 3 |
| EPM 282 | Power Electronics and Drives | 3 |
| MCT 311 | Introduction to Autotronics | 2 |
| CSE 318 | Microcontrollers | 3 |
| MCT 321 | Introduction to Nano-Mechatronics | 2 |
| MCT 333 | CNC and CAD/CAM | 3 |
| MCT 334 | Rapid Prototyping | 3 |
| MCT 341 | Introduction to Bio-Mechatronics | 2 |
| CSE 347 | Embedded System Design | 3 |
| MCT 351 | Pneumatics and Hydraulics Control | 3 |
| MCT 371 | Automatic Control | 3 |
| MCT 381 | Design of Mechatronic Systems (1) | 3 |
| MCT 382 | Design of Mechatronic Systems (2) | 3 |
| MCT 455 | Industrial Robotics | 3 |
| MCT 456 | Dynamic Modeling and Simulation | 3 |
| MCT 461 | Industrial Networks | 3 |
| CSE 488 | Machine Vision | 3 |
| MCT 498 | Graduation Project (1) | 3 |
| MCT 499 | Graduation Project (2) | 3 |
| | Total Credit Hours | 101 |

## Technical Electives for Mechatronics Engineering and Automation Program

Technical elective courses are categorized into four fields; the student must select five courses from the same field with a total of (15) credit hours.

| Field | Course Code | Course Title | Credit Hours |
|---|---|---|---|
| Autotronics | MEA 313 | Automotive Theory | 3 |
| | MEA 323 | Automotive Design | 3 |
| | MCT 411 | Automotive Embedded Networking | 3 |
| | MCT 412 | Autotronics | 3 |
| | MEA 442 | Engine Management Systems | 3 |

| Field | Course Code | Course Title | Credit Hours |
|---|---|---|---|
| Nano-Mechatronics | MCT 322 | Nanotechnology | 3 |
| | MCT 323 | Nano-Imaging and Testing | 3 |
| | MCT 421 | Introduction to MEMS/NEMS | 3 |
| | MCT 422 | MEMS/NEMS Fabrication, Packaging, and Testing | 3 |
| | MCT 423 | Advanced MMS/NMS Design | 3 |

| Field | Course Code | Course Title | Credit Hours |
|---|---|---|---|
| Industrial Mechatronics | MCT 331 | Industrial Mechanisms and Robotics | 3 |
| | MCT 332 | Industrial Automation | 3 |
| | MCT 431 | Autonomous Systems | 3 |
| | MCT 432 | Hybrid Control Systems | 3 |
| | CSE 488 | Computational Intelligence | 3 |

| Field | Course Code | Course Title | Credit Hours |
|---|---|---|---|
| Bio-Mechatronics | MCT 342 | Introduction to Biomechanics | 3 |
| | MCT 343 | Locomotion and Gait Analysis | 3 |
| | MCT 441 | Smart Actuators and Sensors | 3 |
| | MCT 442 | Biomedical Engineering | 3 |
| | MCT 443 | Rehabilitation Robots | 3 |

# Course Tree of Mechtronics Engineering and Automation Program