

MECHATRONICS ENGINEERING MAJOR

Major Requirements

Bachelor of Science in Mechatronics Engineering

135 credits

Natural Science and Math Requirements

| Code | Title | Credits |
|--------------------------|---|-----------|
| MATH 1141 | Calculus I for Chemistry, Engineering, and Physics Majors ¹ | 4 |
| MATH 1142 | Calculus II for Chemistry, Engineering, and Physics Majors ¹ | 4 |
| MATH 2243 | Calculus III for Chemistry, Engineering, and Physics Majors | 4 |
| MATH 2211 | Applied Matrix Theory | 3 |
| MATH 2217 | Statistics I | 3 |
| MATH 2251 | Ordinary Differential Equations | 3 |
| Science or Math Elective | | 3 |
| PHYS 1171 & 1171L | General Physics I and General Physics I Lab ¹ | 4 |
| PHYS 1172 & 1172L | General Physics II and General Physics II Lab ¹ | 4 |
| Total Credits | | 32 |

Major Requirements

For a major in Mechatronics Engineering, students complete the following:

| Code | Title | Credits |
|----------------|--|---------|
| ENGR 1031 | Fundamentals of Engineering | 3 |
| CPEG 2245 | Digital Design I | 3 |
| CPEG 2245L | Digital Design I Lab | 1 |
| CPSC 1101 | Introduction to Computing | 3 |
| CPSC 4350 | Introduction to Data Science | 3 |
| CPSC 1131 | Fundamentals of Programming | 3 |
| ELEG 3231 | Introduction to Electronics Circuits and Devices | 3 |
| ELEG 3231L | Electronics Circuits Lab | 1 |
| ELEG 3348 | Embedded Microcontrollers | 3 |
| ELEG 3348L | Embedded Microcontrollers Lab | 1 |
| ELEG 4355 | Sensor Design and Applications | 3 |
| ELEG 2213 | Introduction to Electric Circuits | 3 |
| ELEG 2213L | Electric Circuits Lab | 1 |
| ENGR 3260 | Robots | 3 |
| ENGR 4301 | Feedback Control Systems | 3 |
| ENGR 4303 | Industrial Automation | 3 |
| ENGR 4305 | Design of Mechatronics Systems | 3 |
| ELEG 4365 | Internet of Things | 3 |
| Major Elective | | 3 |

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|----------------------|---------------------------|-----------|
| ENGR 2130 | Engineering Graphics I | 3 |
| ENGR 2145 | Mathematical Analysis | 3 |
| ENGR 2145P | Mathematical Analysis PLG | 0 |
| ENGR 4961 | Senior Design Project I | 3 |
| ENGR 4962 | Senior Design Project II | 3 |
| MEEG 2203 | Kinematics and Dynamics | 3 |
| MEEG 3308 | Strength of Materials | 3 |
| MEEG 2201 | Engineering Statics | 3 |
| Total Credits | | 70 |

Remaining *Magis* Core Requirements

| Code | Title | Credits |
|---|--|-----------|
| Modern/Classical Language Orientation Level | | 3 |
| Religious Studies Orientation Level | | 3 |
| ENGL 1001 | Introduction to Rhetoric and Composition | 3 |
| PHIL 1101 | Introduction to Philosophy | 3 |
| History Orientation Level | | 3 |
| Visual and Performing Arts Exploration Tier | | 3 |
| Behavioral and Social Sciences Exploration Tier | | 6 |
| History or Philosophy or Religious Studies Exploration Tier | | 6 |
| Literature Exploration Tier | | 3 |
| Total Credits | | 33 |

¹ Fulfills *Magis* Core requirement

Magis Core Requirements

Tier I: Orientation

| Code | Title | Credits |
|--|--|-----------|
| English | | |
| ENGL 1001 | Introduction to Rhetoric and Composition | 3 |
| History | | |
| Select one HIST 1000-level course | | 3 |
| or CLST 1115 or CLST 1116 | | |
| Mathematics | | |
| MATH 1141 | Calculus I for Chemistry, Engineering, and Physics Majors | 4 |
| Modern or Classical Language | | |
| Select one language course based on placement ¹ | | 3 |
| Philosophy | | |
| PHIL 1101 | Introduction to Philosophy | 3 |
| Religious Studies | | |
| Select one RLST 1000-level course | | 3 |
| Modern/Classical Language or Mathematics | | |
| MATH 1142 | Calculus II for Chemistry, Engineering, and Physics Majors | 4 |
| Total Credits | | 23 |

¹ If starting a new language, a placement exam is not necessary.

Tier II: Exploration

| Code | Title | Credits |
|---|---|-----------|
| Behavioral and Social Sciences | | |
| Select two courses from the following fields: | | 6 |
| Communication | | |
| Economics | | |
| Politics | | |
| Psychology (except PSYC 1610) | | |
| Sociology and Anthropology (except ANTH 1200 and ANTH 1210) | | |
| History, Philosophy, Religious Studies | | |
| Select two 2000- or 3000-level courses from two different disciplines | | 6 |
| Literature | | |
| Select one course from the following fields: | | 3 |
| Classics | | |
| English | | |
| Modern Languages and Literatures | | |
| Natural Sciences | | |
| PHYS 1171 & 1171L | General Physics I and General Physics I Lab | 4 |
| PHYS 1172 & 1172L | General Physics II and General Physics II Lab | 4 |
| Visual and Performing Arts | | |
| Select one 1000-level course from the following fields in Visual and Performing Arts: | | 3 |
| Art History and Visual Culture | | |
| Film, Television, and Media Arts | | |
| Music | | |
| Studio Art | | |
| Theatre | | |
| Total Credits | | 26 |

Plan of Study

A typical, full-time, four-year plan of study appears below. Some variation may be possible. Students should always discuss their individual plan of study with their advisor prior to registering for courses.

| Course | Title | Credits |
|--|---|-----------|
| First Year | | |
| Fall | | |
| ENGR 1031 | Fundamentals of Engineering | 3 |
| MATH 1141 | Calculus I for Chemistry, Engineering, and Physics Majors | 4 |
| PHYS 1171 & 1171L | General Physics I and General Physics I Lab | 4 |
| CPSC 1101 | Introduction to Computing | 3 |
| Modern/Classical Language Orientation Level ¹ | | 3 |
| First Year Experience (FYE) | | 0 |
| Credits | | 17 |
| Spring | | |
| CPSC 1131 | Fundamentals of Programming | 3 |
| ENGR 2130 | Engineering Graphics I | 3 |

| | | |
|-------------------|--|---|
| ENGL 1001 | Introduction to Rhetoric and Composition | 3 |
| MATH 1142 | Calculus II for Chemistry, Engineering, and Physics Majors | 4 |
| PHYS 1172 & 1172L | General Physics II and General Physics II Lab | 4 |

Credits 17

Second Year

Fall

| | | |
|---|---|---|
| PHIL 1101 | Introduction to Philosophy | 3 |
| MATH 2243 | Calculus III for Chemistry, Engineering, and Physics Majors | 4 |
| ELEG 2213 | Introduction to Electric Circuits | 3 |
| ELEG 2213L | Electric Circuits Lab | 1 |
| MEEG 2201 | Engineering Statics | 3 |
| MEEG 2201 Religious Studies Orientation Level | | 3 |
| Ignatian Seminar I-Laudato Si' | | 0 |

Credits 17

Spring

| | | |
|--|---------------------------------|---|
| ENGR 2145 | Mathematical Analysis | 3 |
| ENGR 2145P | Mathematical Analysis PLG | 0 |
| MATH 2251 | Ordinary Differential Equations | 3 |
| CPEG 2245 | Digital Design I | 3 |
| CPEG 2245L | Digital Design I Lab | 1 |
| MEEG 3308 | Strength of Materials | 3 |
| History Orientation Level ² | | 3 |

Credits 16

Third Year

Fall

| | | |
|--|--|---|
| ELEG 3348 | Embedded Microcontrollers | 3 |
| ELEG 3348L | Embedded Microcontrollers Lab | 1 |
| ENGR 3260 | Robots | 3 |
| Visual and Performing Arts Exploration Tier ³ | | 3 |
| MATH 2217 | Statistics I | 3 |
| ELEG 3231 | Introduction to Electronics Circuits and Devices | 3 |
| ELEG 3231L | Electronics Circuits Lab | 1 |
| Ignatian Seminar II - Reflection | | 0 |

Credits 17

Spring

| | | |
|--|--------------------------------|---|
| MATH 2211 | Applied Matrix Theory | 3 |
| Behavioral and Social Sciences Exploration Tier ⁴ | | 3 |
| MEEG 2203 | Kinematics and Dynamics | 3 |
| CPSC 4350 | Introduction to Data Science | 3 |
| ENGR 4301 | Feedback Control Systems | 3 |
| ELEG 4355 | Sensor Design and Applications | 3 |

Credits 18

Fourth Year

Fall

| | | |
|--|--------------------------------|---|
| ENGR 4961 | Senior Design Project I | 3 |
| ENGR 4303 | Industrial Automation | 3 |
| ENGR 4305 | Design of Mechatronics Systems | 3 |
| ELEG 4365 | Internet of Things | 3 |
| History or Philosophy or Religious Studies Exploration Tier ⁵ | | 3 |

| | |
|--|------------|
| Major Elective ⁶ | 3 |
| Ignatian Seminar III-Social Action | 0 |
| Credits | 18 |
| Spring | |
| ENGR 4962 Senior Design Project II | 3 |
| Science (or Math) Elective | 3 |
| Behavioral and Social Sciences Exploration Tier ⁴ | 3 |
| History or Philosophy or Religious Studies Exploration Tier ⁵ | 3 |
| Literature Exploration Tier | 3 |
| Credits | 15 |
| Total Credits | 135 |

¹ Choose any language offered by the Department of Modern Languages and Literatures, based on placement exam.

² Choose any appropriate History or Religious Studies course at the 1000 level.

³ Visual and Performing Art History courses may be chosen from Art History, Music, Film, Television, and Media Arts, Studio Art, or Theatre.

⁴ Core Social Science course may be fulfilled by appropriate courses in Communication, Economics, Psychology, Politics, or Sociology and Anthropology.

⁵ Choose any appropriate Religious Studies, History, or Philosophy core course.

⁶ Major elective should be chosen with approval of advisor from among courses offered by the School of Engineering and Computing.