Grand Valley State University
Seymour and Esther Padnos College of Engineering

Bachelor of Science in Engineering (B.S.E.)

# Interdisciplinary Engineering: Mechatronics Engineering Emphasis

**Honors College: MTH 201 Start, 5 Year Plan**

Secondary Admission Required

**2024 – 2025 Catalog Year**

## 1st Year

| Fall | | Winter | | Spring/Summer | |
|---|---|---|---|---|---|
| *MTH 201: Calculus 1 | 4 | *MTH 202: Calculus 2 | 4 | *EGR 185: First-Year EGR Design | 2 |
| *EGR 100: Intro to EGR | 1 | *EGR 113: Intro to CAD/CAM | 1 | | |
| *EGR 111: Intro to EGR Graphics | 1 | *EGR 108: Appl Program for EGR 2 | 2 | | |
| *EGR 104: Appl Program for EGR 1 | 2 | HNR 153: Interdisciplinary Sequence 3 | 3 | | |
| HNR 151: Interdisciplinary Sequence 1 | 3 | HNR 154: Interdisciplinary Sequence 4 | 3 | | |
| HNR 152: Interdisciplinary Sequence 2 | 3 | | | | |
| **Total** | **14** | **Total** | **13** | **Total** | **2** |

## 2nd Year

| Fall | | Winter | | Spring/Summer | |
|---|---|---|---|---|---|
| *MTH 203: Calculus 3 | 4 | *MTH 302: Linear Algebra/Differential EQ | 4 | | |
| *CHM 115: Chemistry 1 | 4 | *PHY 230: Physics 1 | 5 | | |
| *STA 220: Statistical Modeling for EGR | 2 | ECO 210 or 211: Economics | 3 | | |
| *EGR 220: EGR Measure & Data | 1 | | | | |
| HNR 201: Live. Learn. Lead | 3 | | | | |
| **Total** | **14** | **Total** | **12** | | |

## 3rd Year

| Fall | | Winter | | Spring/Summer | |
|---|---|---|---|---|---|
| *PHY 234 or 231: Physics 2 | 4-5 | *EGR 250: Materials Science & EGR | 3 | EGR 290: Engineering Co-Op 1 | 3 |
| *EGR 209: Mechanics & Machines | 4 | *EGR 251: Materials Science & EGR Lab | 1 | IE Track (see chart) | 3 |
| *EGR 214: Circuit Analysis 1 | 3 | IE Track (see chart) | 3-4 | | |
| *EGR 215: Circuit Analysis 1 Lab | 1 | IE Track (see chart) | 3-4 | | |
| *EGR 289: EGR Professionalism | 1 | | | | |
| **Total** | **13-14** | **Total** | **10-12** | **Total** | **6** |

## 4th Year ~ Admission Required

| Fall | | Winter | | Spring/Summer | |
|---|---|---|---|---|---|
| EGR 314: Circuit Analysis 2 | 4 | EGR 390: Engineering Co-Op 2 | 3 | EGR 445: Robotics Systems EGR | 4 |
| EGR 315: Electronic Circuits 1 | 4 | EGR 312: Dynamics (Sensor Track) | 3 | EGR 455: Automatic Control | 4 |
| IE Track (see chart) | 4 | | | IE Track (see chart) | 4 |
| **Total** | **12** | **Total** | **6** | **Total** | **12** |

## 5th Year ~ Admission Required

| Fall | | Winter | | Spring/Summer | |
|---|---|---|---|---|---|
| EGR 490: Engineering Co-Op 3 | 3 | EGR 485: Senior EGR Project 1 | 1 | EGR 486: Senior EGR Project 2 | 2 |
| EGR 352: Kin & Dynamics (Mech. Track) | 4 | IE Track (see chart) | 4 | IE Track (see chart) | 3-4 |
| | | IE Track (see chart) | 3-4 | | |
| | | HNR 350: Integrative Seminar | 3 | | |
| | | Supplemental Writing Skills | 3 | | |
| **Total** | **7** | **Total** | **14-15** | **Total** | **5-6** |

- This is a suggested curriculum guide that might not be applicable to every student
- Foundation courses are required for secondary admission and are designated by an asterisk (*) on this guide
- Student must have a **minimum of 120 credits** to graduate, with **58 of the 120 credits** being from a senior level institution and the **final 30 of the 120 credits** completed at GVSU

**Padnos College of Engineering and Computing ~ Student Services Office**
B-3-241 Mackinac Hall and 101 Eberhard Center
(616) 331-6025 or online at www.gvsu.edu/pcec/advising

| IE – Mechatronics Foundation Requirements | | | |
|---|---|---|---|
| MTH 201 | MTH 202 | MTH 203 | MTH 302 |
| WRT 150 or WRT 130 | CHM 115 | PHY 230 | PHY 234 or PHY 231 |
| EGR 100 | EGR 111 | EGR 112 (or EGR 104+ EGR 108) | EGR 113 |
| EGR 185 | EGR 289 | EGR 220 + STA 220 | EGR 214+215 |
| EGR 226+227 | EGR 209 | EGR 309 + 310 | EGR 250+251 |

| Honors Requirements | |
|---|---|
| HNR 151 | HNR 152 |
| HNR 153 | HNR 154 |
| HNR 300 (fulfilled by EGR 290) | HNR 201 |
| HNR 251 (fulfilled by EGR 100 + EGR 185) | HNR 350 |
| HNR 401/499 (fulfilled by EGR 485 + EGR 486) | |

**Secondary Admission Requirements:**

*Detailed application and admission requirements available at https://www.gvsu.edu/engineering/secondary-admission-to-engineering-majors-44.htm*

- ✓ A GPA of 2.7 or above in Engineering Foundation courses. Foundation courses are designated by an asterisk (*) on this guide.
- ✓ Completion of each course in the Engineering Foundation with a grade of C (2.0) or above, with no more than one repeat.
- ✓ Completion of preparation for placement in the cooperative engineering education course, EGR 289.

**Major Declaration Steps:**

An emphasis area is required for the Interdisciplinary Engineering major. Emphasis areas include: Data Science, Design & Innovation, Engineering Management, Environmental Engineering, Mechatronics and Renewable Energy.

1) To declare this emphasis, login to MyBanner, select "Student Records" and then "Change Major."
2) Click on "Change Major 1" and select ***Interdisciplinary Engineering – Mechatronics Emphasis***.
3) Click "Submit" and then "Change to New Program."
4) Students are required to complete one IE Track Elective (see below). Please plan ahead! Course descriptions are listed in the GVSU Academic Catalog.

**Honors Notes:**

The Frederik Meijer Honors College and the School of Engineering have approved the following substitutions for the honors curriculum:

1) Together, EGR 100 and EGR 185 fulfill the HNR 251 requirement.
2) EGR 290 fulfills the HNR 300 requirement.
3) EGR 485 fulfills the HNR 401 requirement.
4) EGR 486 fulfills the HNR 499 requirement.
5) The completion of the honors curriculum will fulfill the engineering ethics requirement.
6) All GVSU students must earn credit for two Supplemental Writing Skills (SWS) courses. Honors students can earn credit for one SWS course by completing HNR 154 (the winter semester of a first-year sequence) with a grade of C or better. They must earn their second SWS course credit outside of the Honors requirements.

**Recommendations:**

It is strongly encouraged that students do not begin or break curriculum thread by taking courses at other institutions.

*For example*: Taking MTH 201 equivalent elsewhere, then return to Grand Valley and continuing in the math thread with MTH 202.

| **Mechanical Track** | |
|---|---|
| EGR 226/227 | 6th Semester Winter (foundation course) |
| EGR 309/310 | 6th Semester Winter |
| EGR 312 | Spring/Summer Co-op |
| EGR 346 | 7th Semester Fall |
| EGR 409 | 8th Semester Spring/Summer |
| EGR 352 | Fall Co-op |
| EGR 450 | 9th Semester Winter |
| **Mechanical Track Electives** | |
| EGR 224 | Introduction to Digital System Design |
| EGR 436 | Embedded Systems Interface |
| EGR 424 | Design of Microcontroller Applications |
| EGR 350 | Vibrations |

| **Sensor- Controls Track** | |
|---|---|
| EGR 224 | 6th Semester Winter |
| EGR 223 | 6th Semester Winter |
| EGR 226/227 | Spring/Summer Co-op (foundation course) |
| EGR 326 | 7th Semester Fall |
| EGR 312 | Winter Co-op |
| EGR 309/310 | 8th Semester Spring/Summer |
| **Sensor-Controls Track Electives** | |
| EGR 436 | 9th Semester Winter |
| EGR 409 | Machine Design 2 |
| EGR 450 | Manufacturing Controls |
| EGR 352 | Kinematics and Dynamics of Machinery |
| EGR 424 | Design of Microcontroller Applications |