

**Interdisciplinary Engineering:
Mechatronics Engineering Emphasis**

MTH 110 Start, 5 Year Plan

Secondary Admission Required

| 1st Year | | | | | |
|---|-----------|--|-----------|---------------------------------|--------------|
| Fall | | Winter | | Spring/Summer | |
| MTH 110: Algebra | 4 | MTH 124: Precalculus: F & M | 5 | | |
| *WRT 150: Strategies in Writing | 4 | *CHM 115: Chemistry 1 | 4 | | |
| or WRT 120 and WRT 130 | | *EGR 100: Intro to Engineering | 1 | | |
| General Education | 3 | *EGR 111: Intro to Engineering Graphics | 1 | | |
| General Education | 3 | General Education | 3 | | |
| Total | 14 | Total | 14 | | |
| 2nd Year | | | | | |
| Fall | | Winter | | Spring/Summer | |
| *MTH 201: Calculus 1 | 4 | *MTH 202: Calculus 2 | 4 | *EGR 185: First-Year EGR Design | 2 |
| *EGR 104: Appl Program for EGR 1 | 2 | *PHY 230: Physics 1 | 5 | | |
| *EGR 113: Intro to CAD/CAM | 1 | *EGR 108: Appl Program for EGR II | 2 | | |
| ECO 210 or 211: Economics | 3 | *STA 220: Statistical Modeling for EGR | 2 | | |
| General Education | 3 | *EGR 220: EGR Measure & Data | 1 | | |
| Total | 13 | Total | 14 | Total | 2 |
| 3rd Year | | | | | |
| Fall | | Winter | | Spring/Summer | |
| *MTH 203: Calculus 3 | 4 | *MTH 302: Linear Algebra/Differential EQ | 4 | EGR 290: Engineering Co-Op 1 | 3 |
| *PHY 234 or 231: Physics 2 | 4-5 | *EGR 250: Materials Science & EGR | 3 | IE Track (see chart) | 3 |
| *EGR 209: Mechanics & Machines | 4 | *EGR 251: Materials Science & EGR Lab | 1 | | |
| *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 17-18 | | Total 14-16 | | Total | 6 |
| 4 th 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 |
| 5 th 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 | General Education | 3 |
| | | General Education | 3 | General Education | 3 |
| | | General Education | 3 | General Education | 3 |
| Total | 7 | Total 14-15 | | Total | 14-15 |

- 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 |

General Education Requirements

| | |
|--|--|
| WRT 150: Strategies in Writing (grade of "C" or higher required) or WRT 120 and WRT 130 (grade of "C" or higher required in both) | Life Sciences (BIO 105) |
| Physical Sciences (CHM 115) | Philosophy and Literature |
| Arts | Mathematical Sciences (MTH 201) |
| Social Behavioral Sciences (ECO 210 or 211) | Social Behavioral Sciences |
| Historical Analysis (consider HSC 202) | U.S. Diversity |
| Global Perspectives | 2 Supplemental Writing Skills Courses (prerequisite: WRT 130 or WRT 150) |
| 2 Issues Courses (prerequisite: must have 55+ credits) | |

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.

Major Notes:

- 1) It is recommended that anyone on a 5 year EGR plan complete the EGR 104+108 stretch option in place of EGR 112. Please speak with an advisor if you have questions about which option is best for you.
- 2) Consider taking a course that fulfills the U.S. Diversity category and one non-ECO Social and Behavioral Science course.
- 3) Consider taking a course that fulfills the Global Perspectives category and one Issues course.
- 4) An ethics course is required in the engineering program. It is recommended to take **ONE** of the following:
 - a. EGR 302 (Engineering Decision-Making in Society), BIO 328, BIO 338, COM 438, MGT 340, MGT 438, MKT 375, PHI 325 or PLS 338 in the Issues category
 - b. PHI 102 in the Philosophy and Literature category
 - c. For Honors College students, the ethics requirement is fulfilled by completion of the Honors Curriculum
- 5) ECO 210 or 211 is required for the engineering major AND fulfills one Social and Behavioral Science course.
- 6) Two Supplemental Writing Skills (SWS) courses are required for graduation. These can be fulfilled via other general education categories. **For example, EGR 302 will fulfill ONE SWS requirement, one Issues requirement AND the engineering ethics requirement.**

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 | 6 th Semester Winter (foundation course) |
| EGR 309/310 | 6 th Semester Winter |
| EGR 312 | Spring/Summer Co-op |
| EGR 346 | 7 th Semester Fall |
| EGR 409 | 8 th Semester Spring/Summer |
| EGR 352 | Fall Co-op |
| EGR 450 | 9 th 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 | 6 th Semester Winter |
| EGR 223 | 6 th Semester Winter |
| EGR 226/227 | Spring/Summer Co-op (foundation course) |
| EGR 326 | 7 th Semester Fall |
| EGR 312 | Winter Co-op |
| EGR 309/310 | 8 th Semester Spring/Summer |
| Sensor-Controls Track Electives | |
| EGR 436 | 9 th Semester Winter |
| EGR 409 | Machine Design 2 |
| EGR 450 | Manufacturing Controls |
| EGR 352 | Kinematics and Dynamics of Machinery |
| EGR 424 | Design of Microcontroller Applications |