

## Electrical Engineering/ Bioengineering Concentration BS – STEM Track

Fall 2009 – Spring 2010

### CONTACT INFORMATION

- Honors College Advisor: Kathleen Alligood (alligood@gmu.edu)
- Department Chair: Andre Manitiu (amanitiu@gmu.edu)
- Department Program Coordinator: William Sutton (wsutton@gmu.edu)

Once students begin attending Mason and declare a major they should see both their Honors College and their major department advisor for advising.

### REQUIRED HOURS

- Hours Required in Major: 80
- Hours Required in Honors: see honors advisor

### ADVISING SHEET

- Honors College Requirement
- ◆ Department Requirement
- ▲ College Requirement

|  |                |                |
|--|----------------|----------------|
| <b>1<sup>st</sup> Year – 1<sup>st</sup> Semester (Fall)</b>  |                | <b>Credits</b> |
| ○ HNRS 110: Introduction to Research (Grade C or better required)  |                | 4              |
| ◆ MATH 113: Analytic Geometry and Calculus I (a placement exam is required)  |                | 4              |
| ◆ CS 112: Introduction To Computer Programming   |                | 4              |
| ◆ ENGR 107: Introduction to Engineering (Grade C or better required)   |                | 2              |
| ◆ ECON 103 or ECON 103H: Contemporary Microeconomic Principles <sup>1</sup>  |                | 3              |
|  | Semester Total | 17             |
| <b>1<sup>st</sup> Year – 2<sup>nd</sup> Semester (Spring)</b>  |                |                |
| ○ HNRS 122: Reading the Arts   |                | 3              |
| ◆ ECE 101: Information Technology for Electrical Engineers (Grade C or better required)  |                | 3              |
| ◆ MATH 114: Analytic Geometry and Calculus II (prerequisite: "C" or better in MATH 113) or MATH 116: Analytic Geometry and Calculus II Honors <sup>1</sup>   |                | 4              |
| ◆ PHYS 160/161 or PHYS 160H/161: University Physics I (Corequisite MATH 114) <sup>1</sup>  |                | 3/1            |
| ◆ CS 222: Computer Programming for Engineers (Prerequisite CS 112)   |                | 3              |
|  | Semester Total | 17             |
| <b>2<sup>nd</sup> Year – 1<sup>st</sup> Semester (Fall)</b>  |                |                |
| ○ HNRS 131: Contemporary Society in Multiple Perspectives  |                | 3              |
| ◆ BENG 201: Intro to Biomed Signals or ECE 201: Intro to Signal Analysis <sup>3</sup> (prerequisite: "C" or better in MATH 113) (Grade C or better required) |                | 3              |
| ◆ MATH 203: Matrix Algebra (Prerequisite MATH 114)   |                | 3              |
| ◆ MATH 213: Analytic Geometry and Calculus III or MATH 215 <sup>1</sup>  |                | 3              |
| ◆ PHYS 260/261 or PHYS 260H/261: University Physics II (Corequisite MATH 213) <sup>1</sup>   |                | 4              |
|  | Semester Total | 16             |
| <b>2<sup>nd</sup> Year – 2<sup>nd</sup> Semester (Spring)</b>  |                |                |

|  |     |
|--|-----|
| ◆ BIOL 213: Cell Structure and Function  | 4   |
| ◆ ECE 220: Signals and Systems I (Prerequisite ECE 201, Corequisites MATH 203 and 204)                                     | 3   |
| ◆ ECE 280: Electric Circuit Analysis (Prerequisite PHYS 260 and 261, Corequisite ECE 220)                                  | 5   |
| ◆ MATH 214: Elementary Differential Equations (Prerequisite MATH 213 or 215) or MATH 216                                   | 3   |
| Semester Total   | 15  |
| <b>3<sup>rd</sup> Year – 1<sup>st</sup> Semester (Fall)</b>  |     |
| ○ HNRS 240: Reading the Past   | 3   |
| ◆ ECE 320: Signals and Systems II (Prerequisite C or Better in ECE 220 and MATH 203)                                       | 3   |
| ◆ ECE 331/332: Digital Systems Design (Corequisite ECE 280)  | 3/1 |
| ◆ ECE 333/334: Linear Electronics I (Prerequisite C or Better in ECE 280)  | 3/1 |
| Semester Total   | 14  |
| <b>3<sup>rd</sup> Year – 2<sup>nd</sup> Semester (Spring)</b>  |     |
| ○ HNRS 353: Technology in the Contemporary World (grade of C or better required)   | 3   |
| ◆ ECE 433: Linear Electronics II   | 3   |
| ◆ BENG 401/402: BE Instrumentation & Design / Lab  | 4/1 |
| ◆ STAT 346: Probability for Engineers (Prerequisite MATH 213)  | 3   |
| Semester Total   | 14  |
| <b>4<sup>th</sup> Year – 1<sup>st</sup> Semester (Fall)</b>  |     |
| ◆ ECE 305: Electromagnetic Theory  | 3   |
| ◆ ECE 491: Engineering Seminar (Prerequisites: 90 credits applicable to electrical engineering) <sup>5</sup>               | 1   |
| ◆ BENG 492: Senior Advanced Design Project I (Prerequisites: 90 credits applicable to electrical engineering) <sup>5</sup> | 2   |
| ◆ ECE 421: Classical Systems and Control Theory or ECE 445: Computer Organization  | 3   |
| ◆ ECE Advanced Engineering Laboratory  | 1   |
| ◆ BENG Technical Elective <sup>4</sup>   | 3   |
| ◆ Department-approved Elective <sup>2</sup>  | 3   |
| Semester Total   | 16  |
| <b>4<sup>th</sup> Year – 2<sup>nd</sup> Semester (Spring)</b>  |     |
| ◆ BENG 493: Senior Advanced Design Project II  | 2   |
| ◆ ECE 421: Classical Systems and Control Theory or ECE 445: Computer Organization  | 3   |
| ◆ BENG Technical Elective <sup>4</sup>   | 3   |
| ◆ BENG Advanced Engineering Laboratory   | 1   |
| ◆ Department-approved Elective <sup>2</sup>  | 3   |
| Semester Total   | 12  |
| Total Hours  | 121 |

## NOTES

1. To complete the STEM Track, students must take two (2) of the following courses:
  - BIOL 213H
  - BIOL 303H
  - ECON 103H
  - CHEM 211H
  - CHEM 212H
  - CS 211H
  - MATH 116
  - MATH 215
  - PHYS 160H
  - PHYS 260H
  - PHYS 262H
2. College requirements (VS) include 24 credit hours of department-approved, liberal arts and social science electives.
3. BENG 201 is planned to replace ECE 201. The topics are similar but the BENG designation signifies considerable biomedical exposure. For the time being, ECE 201 is accepted for BENG 201 since ECE 201 now contains some biomedical content.
4. Two bioengineering-related Technical Electives (6 hours total) are substituted for two ECE Technical Electives. These electives need to have some bioengineering content. Students are advised, but not required, to consider including BIOL 425 (Human Physiology, 3 credits) as one of these electives. Only BIOL 213 is a required prerequisite for BIOL 425; the BIOL 303 prerequisite listed is waived for BSEE students who are at least juniors.
5. The Honors Program requirements fulfill the ENGL 302 prerequisite for ECE 491 and 492 but the prerequisite requirement is not automatically applied. Please contact Prof. William Sutton ([wsutton@gmu.edu](mailto:wsutton@gmu.edu)) to request a prerequisite override before attempting to register for these courses.