

BIOMEDICAL ENGINEERING, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2024-25 academic year. To access previous years' suggested academic plans, please visit the archive (<https://bulletins.psu.edu/undergraduate/archive/>) to view the appropriate Undergraduate Bulletin edition.

Biochemical Option: Biomedical Engineering, B.S. at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

If you are starting at a campus other than the one this plan is ending at, please refer to: <http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>

First Year

| Fall | Credits | Spring | Credits |
|--|-----------|---|-----------|
| CHEM 110 (GN) ^{*#†} | 3 | CHEM 112 (GN) | 3 |
| CHEM 111 (GN) | 1 | CHEM 113 (GN) | 1 |
| EDSGN 100 ^{*#} | 3 | MATH 141 or 141E (GQ) ^{*†##} | 4 |
| MATH 140 or 140E (GQ) ^{*†##} | 4 | PHYS 211 (GN, PHYSICS 211L & PHYSICS 211R) ^{*##} | 4 |
| BME 100 (or First Year Seminar) [†] | 1 | ENGL 15, 30H, or ESL 15 (GWS) ^{††} | 3 |
| ECON 102 or 104 (GS) [†] | 3 | General Education Course [†] | 3 |
| | 15 | | 18 |

Second Year

| Fall | Credits | Spring | Credits |
|---|-----------|---------------------------------------|-----------|
| BIOL 141 [*] | 3 | BME 201 [*] | 3 |
| BIOL 142, 162, or 164 [*] | 1 | CHEM 202 or 210 | 3 |
| EMCH 210 | 5 | CMPSC 200 | 3 |
| MATH 251 [*] | 4 | MATH 230 | 4 |
| PHYS 212 (PHYSICS 212L & PHYSICS 212R) [*] | 4 | General Education Course [†] | 3 |
| | 17 | | 16 |

Third Year

| Fall | Credits | Spring | Credits |
|---------------------------------------|---------|----------------------|---------|
| BME 301 [*] | 4 | BME 401 [*] | 3 |
| BME 303 | 3 | BME 402 [*] | 3 |
| BME 313 [*] | 3 | BME 403 | 1 |
| Related Technical Elective | 3 | BME 409 | 3 |
| General Education Course [†] | 3 | BME 413 | 3 |

| | | | |
|---|----------------|---|----------------|
| | | ENGL 202C (GWS) ^{††} | 3 |
| | 16 | | 16 |
| Fourth Year | | | |
| Fall | Credits | Spring | Credits |
| BME 429 | 2 | BME 423 | 3 |
| BME 440 | 1 | BME 450W | 3 |
| Biochemical Elective | 3 | Biochemical Elective | 3 |
| Science or Engineering Elective | 3 | Biochemical Elective | 3 |
| CAS 100A or 100B (GWS) ^{††} | 3 | General Education Course [†] | 3 |
| General Education Course [†] | 3 | General Education Course (GHW) [†] | 1.5 |
| General Education Course (GHW) [†] | 1.5 | | |
| | 16.5 | | 16.5 |

Total Credits 131

- * Course requires a grade of C or better for the major
- ‡ Course requires a grade of C or better for General Education
- # Course is an Entrance to Major requirement
- † Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

College Notes:

- Students who are interested in medical school should substitute BIOL 240W (4) for BIOL 141 (3) & BIOL 142 (1).
- CHEM 210 is required for students who are interested in medical school or who plan to take advanced organic chemistry.
- CMPSC 200 is required because 300- and 400-level BME courses use MATLAB programming.
- The department website lists courses acceptable as Biochemical Electives, Medical Imaging and Device Electives, Biomaterials Electives, Biomechanics Electives, Related Electives, and Science or Engineering Electives.

- Students who complete the ROTC Program may substitute 3 ROTC credits for the GHW requirement and 3 ROTC credits for a Science or Engineering Elective.
- ***These courses offered at University Park in Fall semester ONLY:***
 - BME 301
 - BME 303
 - BME 313
 - BME 440
- ***These courses offered at University Park in Spring semester ONLY:***
 - BME 201
 - BME 401
 - BME 402
 - BME 403
 - BME 409
 - BME 413
 - BME 423

Biomaterials Option: Biomedical Engineering, B.S. at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

If you are starting at a campus other than the one this plan is ending at, please refer to: <http://advising.engr.psu.edu/degree-requirements/academic-plans-by-major.aspx>

First Year

| Fall | Credits Spring | Credits |
|--|---|-----------|
| CHEM 110 (GN) ^{*#†} | 3 CHEM 112 (GN) | 3 |
| CHEM 111 (GN) | 1 CHEM 113 (GN) | 1 |
| EDSGN 100 ^{*#} | 3 MATH 141 or 141E (GQ) ^{*†#†} | 4 |
| MATH 140 or 140E (GQ) ^{*†#†} | 4 PHYS 211 (GN, PHYSICS 211L & PHYSICS 211R) ^{*#†} | 4 |
| BME 100 (or First Year Seminar) [†] | 1 ENGL 15, 30H, or ESL 15 (GWS) ^{††} | 3 |
| ECON 102 or 104 (GS) [†] | 3 General Education Course [†] | 3 |
| | 15 | 18 |

Second Year

| Fall | Credits Spring | Credits |
|---|---|-----------|
| BIOL 141 [*] | 3 BME 201 [*] | 3 |
| BIOL 142, 162, or 164 [*] | 1 CHEM 202 or 210 | 3 |
| EMCH 210 | 5 CMPSC 200 | 3 |
| MATH 251 [*] | 4 MATH 230 | 4 |
| PHYS 212 (PHYSICS 212L & PHYSICS 212R) [*] | 4 General Education Course [†] | 3 |
| | 17 | 16 |

Third Year

| Fall | Credits Spring | Credits |
|----------------------|---|-----------|
| BME 301 [*] | 4 BME 401 [*] | 3 |
| BME 303 | 3 BME 402 [*] | 3 |
| BME 313 [*] | 3 BME 403 | 1 |
| BME 443 | 3 BME 409 or 413 (or Biomaterials Elective) | 3 |
| MATSE 201 | 3 ENGL 202C (GWS) ^{††} | 3 |
| | General Education Course [†] | 3 |
| | 16 | 16 |

Fourth Year

| Fall | Credits Spring | Credits |
|---------------------------------------|---|---------|
| BME 429 | 2 BME 450W | 3 |
| BME 440 | 1 Biomaterials Elective | 3 |
| BME 446 | 3 Related Technical Elective | 3 |
| CAS 100A or 100B (GWS) ^{††} | 3 Science or Engineering Elective | 3 |
| BME 408 (or Biomaterials Elective) | 3 General Education Course [†] | 3 |
| General Education Course [†] | 3 General Education Course (GHW) [†] | 1.5 |

| | | |
|---|-------------|-------------|
| General Education Course (GHW) [†] | 1.5 | |
| | 16.5 | 16.5 |

Total Credits 131

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- ‡ Course requires a grade of C or better for General Education
- # Course is an Entrance to Major requirement
- † Course satisfies General Education and degree requirement

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

College Notes:

- Students who are interested in medical school should substitute BIOL 240 (4) for BIOL 141 (3) & BIOL 142 (1).
- CHEM 210 is required for students who are interested in medical school or who plan to take advanced organic chemistry.
- CMPSC 200 is required because 300- and 400-level BME courses use MATLAB programming.
- The department website lists courses acceptable as Biochemical Electives, Medical Imaging and Device Electives, Biomaterials Electives, Biomechanics Electives, Related Electives, and Science or Engineering Electives.
- Students who complete the ROTC Program may substitute 3 ROTC credits for the GHW requirement and 3 ROTC credits for a Science or Engineering Elective.
- **These courses offered at University Park in fall semester only:**
 - BME 301
 - BME 303
 - BME 313
 - BME 429
 - BME 440
 - BME 443
 - BME 446
- **These courses offered at University Park in spring semester only:**

- BME 201
- BME 401
- BME 402
- BME 403
- BME 409
- BME 450W

Biomechanics Option: Biomedical Engineering, B.S. at University Park Campus

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

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First Year

| Fall | Credits Spring | Credits |
|--|---|-----------|
| BME 100 (or First Year Seminar) [†] | 1 CHEM 112 (GN) | 3 |
| CHEM 110 (GN) ^{*#†} | 3 CHEM 113 (GN) | 1 |
| CHEM 111 (GN) | 1 ENGL 15, 30H, or ESL 15 ^{††} | 3 |
| ECON 102 or 104 (GS) [†] | 3 MATH 141 or 141E (GQ) ^{*#††} | 4 |
| EDSGN 100 ^{*#} | 3 PHYS 211 (GN, PHYS 211L & PHYS 211R) ^{*#†} | 4 |
| MATH 140 or 140E (GQ) ^{*#††} | 4 General Education Course [†] | 3 |
| | 15 | 18 |

Second Year

| Fall | Credits Spring | Credits |
|---|---|-----------|
| BIOL 141 [*] | 3 BME 201 [*] | 3 |
| BIOL 142, 162, or 164 [*] | 1 CMPSC 200 | 3 |
| EMCH 210 | 5 EMCH 212 | 3 |
| MATH 251 [*] | 4 MATH 230 | 4 |
| PHYS 212 (PHYS 212L & PHYS 212R) [*] | 4 General Education Course [†] | 3 |
| | 17 | 16 |

Third Year

| Fall | Credits Spring | Credits |
|---------------------------------------|---------------------------------|-----------|
| BME 301 [*] | 4 BME 401 [*] | 3 |
| BME 303 | 3 BME 402 [*] | 3 |
| BME 313 [*] | 3 BME 403 | 1 |
| EMCH 315 | 2 BME 409 | 3 |
| EMCH 316 | 1 ENGL 202C (GWS) ^{††} | 3 |
| General Education Course [†] | 3 Biomechanics Elective | 3 |
| | 16 | 16 |

Fourth Year

| Fall | Credits Spring | Credits |
|---------------------------------------|---|---------|
| BME 408 | 3 BME 450W | 3 |
| BME 429 | 2 Biomechanics Elective | 3 |
| BME 440 | 1 Related Technical Elective | 3 |
| CAS 100A or 100B (GWS) ^{††} | 3 Science or Engineering Elective | 3 |
| Related Technical Elective | 3 General Education Course [†] | 3 |
| General Education Course [†] | 3 General Education Course (GHW) [†] | 1.5 |

| | | |
|---|-------------|-------------|
| General Education Course (GHW) [†] | 1.5 | |
| | 16.5 | 16.5 |

Total Credits 131

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All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

College Notes

- Students who are interested in medical school should substitute BIOL 240W (4) for BIOL 141 (3) & BIOL 142 (1).
- CHEM 210 is required for students who are interested in medical school or who plan to take advanced organic chemistry.
- CMPSC 200 is required because 300- and 400-level BME courses use MATLAB programming.
- The department website lists courses acceptable as Biochemical Electives, Medical Imaging and Device Electives, Biomaterials Electives, Biomechanics Electives, Related Electives, and Science or Engineering Electives.
- Students who complete the ROTC Program may substitute 3 ROTC credits for the GHW requirement and 3 ROTC credits for a Science or Engineering Elective.
- **These courses offered at University Park in fall semester only:**
 - BME 301
 - BME 303
 - BME 313
 - BME 440
- **These courses offered at University Park in spring semester only:**
 - BME 201
 - BME 401
 - BME 402

- BME 403
- BME 409

Medical Imaging & Devices Option: Biomedical Engineering, B.S. at University Park Campus

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First Year

| Fall | Credits Spring | Credits |
|--|---|-----------|
| BME 100 (or First Year Seminar) [†] | 1 CHEM 112 (GN) | 3 |
| CHEM 110 (GN) ^{*#†} | 3 CHEM 113 (GN) | 1 |
| CHEM 111 (GN) | 1 ENGL 15, 30H, or ESL 15 ^{††} | 3 |
| ECON 102 or 104 (GS) [†] | 3 MATH 141 or 141E (GQ) ^{*†#†} | 4 |
| EDSGN 100 ^{*#} | 3 PHYS 211 (GN, PHYS 211L and PHYS 211R) ^{*#†} | 4 |
| MATH 140 or 140E (GQ) ^{*†#†} | 4 | |
| | 15 | 15 |

Second Year

| Fall | Credits Spring | Credits |
|---|---|-----------|
| BIOL 141 [*] | 3 BME 201 [*] | 3 |
| BIOL 142, 162, or 164 [*] | 1 CMPSC 200 | 3 |
| EMCH 210 | 5 EE 210 | 4 |
| MATH 251 [*] | 4 MATH 230 | 4 |
| PHYS 212 (PHYS 212L and PHYS 212R) [*] | 4 General Education Course [†] | 3 |
| | 17 | 17 |

Third Year

| Fall | Credits Spring | Credits |
|---------------------------|--|-----------|
| BME 301 [*] | 4 BME 401 [*] | 3 |
| BME 303 | 3 BME 402 [*] | 3 |
| BME 313 [*] | 3 BME 403 | 1 |
| BME 406 | 3 ENGL 202C (GWS) ^{††} | 3 |
| EE 310, 330, or CMPEN 270 | 4 Medical Imaging and Devices Elective | 3 |
| | Related Technical Elective | 3 |
| | 17 | 16 |

Fourth Year

| Fall | Credits Spring | Credits |
|---------------------------------------|---|---------|
| BME 429 | 2 BME 450W | 3 |
| BME 440 | 1 Medical Imaging and Devices Elective | 3 |
| CAS 100A or 100B (GWS) ^{††} | 3 Related Technical Elective | 3 |
| Science or Engineering Elective | 3 General Education Course [†] | 3 |
| General Education Course [†] | 3 General Education Course [†] | 3 |
| General Education Course [†] | 3 General Education Course (GHW) [†] | 1.5 |

| | | |
|---|-------------|-------------|
| General Education Course (GHW) [†] | 1.5 | |
| | 16.5 | 16.5 |
| Total Credits 130 | | |

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- **These courses offered at University Park in Fall semester ONLY:**
 - BME 301
 - BME 303
 - BME 313
 - BME 406
 - BME 440
- **These courses offered at University Park in Spring semester ONLY:**
 - BME 201
 - BME 401

- BME 402
- BME 403