

BIOCHEMISTRY AND MOLECULAR BIOLOGY, B.S. (SCIENCE)

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 2023-24 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 (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

Biochemistry Option: Biochemistry and Molecular Biology, 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.

First Year

Fall	Credits Spring	Credits
PSU 16	1 MICRB 201 ¹	3
CHEM 110 ^{*#†}	3 MICRB 202 or 203 (consult with an academic adviser for options)	2
CHEM 111 ^{*#†}	1 CHEM 112 ^{*#†}	3
MATH 140 or 140B ^{*#††}	4 CHEM 113 [†]	1
ENGL 15, 30H, or ESL 15 [‡]	3 MATH 141 or 141B ^{††}	4
General Education Course	3 CAS 100A, 100B, or 100C [‡]	3
	15	16

Second Year

Fall	Credits Spring	Credits
BMB 251 ¹	3 BMB 252 ¹	3
CHEM 210	3 CHEM 212	3
PHYS 211 [†]	4 CHEM 213	2
Department List C (consult with an academic adviser for options)	3 PHYS 212 [†]	4
General Education Course	3 BIOL 322	3
	16	15

Third Year

Fall	Credits Spring	Credits
BMB 400 ²	2 BMB 402 ²	3
BMB 401 ²	3 BMB 445W or 443W ³	2

BMB 442	3 BMB, CHEM, or MICRB 400-Level Selections (consult with an academic adviser for options) ²	3
MATH 231 (consult with an academic adviser for options)	2 General Education Course	6
PHYS 213 [†]	2 General Education Course (GHW)	1.5
PHYS 214 [†]	2	
Department List C (consult with an academic adviser for options)	1	
	15	15.5

Fourth Year

Fall	Credits Spring	Credits
BMB 443W, 445W, or 448 ³	3 BMB 474 ²	3
BMB, CHEM, or MICRB 400-Level Selections (consult with an academic adviser for options) ²	3 BMB, CHEM, or MICRB 400-Level Selections (consult with an academic adviser for options) ²	3
CHEM 450	3 CHEM 452	3
Department List C Selection (consult with an academic adviser for options)	3 ENGL 202C, 202A, 202B, or 202D [‡]	3
General Education Course	3 Department List C (consult with an academic adviser for options)	1
General Education Course (GHW)	1.5 General Education Course	3
	16.5	16

Total Credits 125

* 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

¹ To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).

² To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).

³ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.

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.

Biochemistry Option (MATH 22 Start): Biochemistry and Molecular Biology, 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.

First Year

Fall	Credits Spring	Credits Summer	Credits
PSU 16	1 CHEM 110 ^{*#†}	3 CHEM 112 ^{*#†}	3
MATH 22 ¹	3 CHEM 111 ^{*#†}	1 CHEM 113 (if available) [†]	1
MATH 26 ¹	3 MATH 140 or 140B ^{*#†1}	4	
ENGL 15, ESL 15, or ENGL 30H [‡]	3 CAS 100A, 100B, or 100C [‡]	3	
General Education Course	6 General Education Course	3	
	16	14	4

Second Year

Fall	Credits Spring	Credits Summer	Credits
MICRB 201 ²	3 BMB 251 ²	3 BMB 401 ³	3
MICRB 202	2 CHEM 212	3	
CHEM 210	3 CHEM 213W	2	
MATH 141 or 141B ^{†1}	4 PHYS 211 [†]	4	
General Education Course	3 BIOL 322	3	
	15	15	3

Third Year

Fall	Credits Spring	Credits
BMB 252 ²	3 BMB 402 ³	3
BMB 400 ³	2 BMB, CHEM, or MICRB 400-Level Selections (Consult with an academic adviser for options) ³	3
BMB 442 ³	3 PHYS 213 [†]	2
MATH 231 (Consult with an academic adviser for options)	2 PHYS 214 [†]	2
PHYS 212 [†]	4 General Education Course	3

General Education Course (GHW)	1.5 Department List C (Consult with an academic adviser for options)	1
	15.5	14

Fourth Year

Fall	Credits Spring	Credits
BMB 448, 445W, or 443W ⁴	3 BMB 443W or 445W ⁴	2
BMB, CHEM, or MICRB 400-Level Selections (Consult with an academic adviser for options) ³	3 BMB 474 ³	3
CHEM 450	3 CHEM 452	3
ENGL 202C, 202A, 202B, or 202D [‡]	3 BMB, CHEM, or MICRB 400-Level Selections (Consult with an academic adviser for options) ³	3
General Education Course (GHW)	1.5 General Education Course	3
Department List C (Consult with an academic adviser for options)	1	
	14.5	14

Total Credits 125

- * 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

- ¹ 6 credits of MATH 22, MATH 26, MATH 140, or MATH 141 require a grade of C or better for General Education.
- ² To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).
- ³ To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).
- ⁴ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.

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.

Molecular and Cell Biology Option: Biochemistry and Molecular Biology, 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.

First Year

Fall	Credits Spring	Credits
PSU 16	1 MICRB 201 ¹	3
CHEM 110 ^{**†}	3 MICRB 202 or 203 (Consult with an academic adviser for options)	2
CHEM 111 ^{**†}	1 CHEM 112 ^{**†}	3
MATH 140 or 140B ^{*†#††}	4 CHEM 113 [†]	1
ENGL 15, ESL 15, or ENGL 30H [†]	3 MATH 141 or 141B ^{††}	4
General Education Course	3 CAS 100A, 100B, or 100C [†]	3
	15	16

Second Year

Fall	Credits Spring	Credits
BMB 251 ¹	3 BMB 252 ¹	3
CHEM 210	3 CHEM 212	3
PHYS 250 (Consult with and academic adviser for alternative options) [†]	4 CHEM 213	2
Department List B MATH Selection (consult with an academic adviser for options)	3 PHYS 251 (Consult with an academic adviser for alternative options) [†]	4
General Education Course	3 BIOL 322	3
	16	15

Third Year

Fall	Credits Spring	Credits
BMB 400 ²	2 BMB 402 ²	3
BMB 401 ²	3 BMB 460 ²	3
BMB 442	3 BMB 443W or 445W ³	3
MICRB 410 ²	3 General Education Course	6
Department List C (consult with an academic adviser for options)	2 General Education Course (GHW)	1.5
General Education Course (GHW)	1.5	
	14.5	16.5

Fourth Year

Fall	Credits Spring	Credits
BMB 428 ²	3 BMB or MICRB 400-Level Selection (Consult with an academic adviser for options) ²	3
BMB 430 ²	3 ENGL 202C, 202A, 202B, or 202D [†]	3

BMB or MICRB 400-Level Selections (Consult with an academic adviser for options) ²	2 Department List C (consult with an academic adviser for options)	7
BMB 448, 445W, or 443W ³	2 General Education Course	3
General Education Course	3	
Department List C (consult with an academic adviser for options)	3	
	16	16

Total Credits 125

* 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

¹ To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).

² To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).

³ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.

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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.

Molecular and Cell Biology Option (MATH 22 Start): Biochemistry and Molecular Biology, 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.

First Year

Fall	Credits Spring	Credits Summer	Credits
PSU 16	1 CHEM 110 ^{*#†}	3 CHEM 112 ^{*#†}	3
MATH 22 ¹	3 CHEM 111 ^{*#†}	1 CHEM 113 (if available) [†]	1
MATH 26 ¹	3 MATH 140 or 140B ^{*#†1}	4	
ENGL 15, ESL 15, or ENGL 30H [‡]	3 CAS 100A, 100B, or 100C [‡]	3	
General Education Course	6 General Education Course	3	
	16	14	4

Second Year

Fall	Credits Spring	Credits Summer	Credits
MICRB 201 ²	3 BMB 251 ²	3 BMB 401 ³	3
MICRB 202	2 CHEM 212	3	
CHEM 210	3 CHEM 213W	2	
MATH 141 or 141B ⁺¹	4 PHYS 250 (Consult with and academic adviser for alternative options) [†]	4	
General Education Course	3 BIOL 322	3	
	15	15	3

Third Year

Fall	Credits Spring	Credits
BMB 252 ²	3 BMB 402 ³	3
BMB 400 ³	2 BMB 460 ³	3
BMB 442 ³	3 BMB or MICRB 400-Level Selections (Consult with an academic adviser for options) ³	3
PHYS 251 (Consult with an academic adviser for alternative options) [†]	4 General Education Course	3

General Education Course (GHW)	1.5 General Education Course (GHW)	1.5
General Education Course	3	
	16.5	13.5
Fourth Year		
Fall	Credits Spring	Credits
BMB 428 ³	3 BMB 443W or 445W ⁴	3
BMB 430 ³	3 MICRB 410 ³	3
BMB 448, 445W, or 443W ⁴	2 ENGL 202C, 202A, 202B, or 202D [‡]	3
BMB or MICRB 400-Level Selections (Consult with an academic adviser for options) ³	3 Department List C (Consult with an academic adviser for options)	2
Department List C (Consult with an academic adviser for options)	3 Department List B MATH Selection (Consult with an academic adviser for options) ¹	3
	14	14

Total Credits 125

- * 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

- ¹ 6 credits of MATH 22, MATH 26, MATH 140, MATH 141, or List B Mathematics Selection require a grade of C or better for General Education.
- ² To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).
- ³ To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).
- ⁴ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.

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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.

Biochemistry Option: Biochemistry and Molecular Biology, B.S. at Commonwealth Campuses

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First Year

Fall	Credits Spring	Credits
CHEM 110 ^{*#†}	3 CHEM 112 ^{*#†}	3
CHEM 111 ^{*#†}	1 CHEM 113 [†]	1
MATH 140 ^{*#††}	4 MATH 141 ^{††}	4
BIOL 110 [†]	4 PHYS 211 [†]	4
ENGL 15, ESL 15, or ENGL 30H [†]	3 General Education Course	3
General Education Course (GHW)	1.5 General Education Course (GHW)	1.5
	16.5	16.5

Second Year

Fall	Credits Spring	Credits
BIOL 230W ^{†1}	4 CHEM 212	3
CHEM 210	3 CHEM 213	2
PHYS 212 [†]	4 PHYS 213 [†]	2
General Education Course	3 PHYS 214 [†]	2
CAS 100A, 100B, or 100C [‡]	3 ENGL 202C, 202A, 202B, or 202D [‡]	3
	General Education Course	3
	17	15

Third Year

Fall	Credits Spring	Credits
BMB 252 ¹	3 BMB 400 ²	2
MICRB 201 ¹	3 BMB 401 ²	3
MICRB 202	2 BMB 442 ²	3
BIOL 222 ⁴	3 BMB, CHEM, or MICRB 400-Level Selections (Consult with an academic adviser for options) ²	3
MATH 231 (Consult with an academic adviser for options)	2 General Education Course	3
General Education Course	3 Department List C (Consult with an academic adviser for options)	1
	16	15

Fourth Year

Fall	Credits Spring	Credits
BMB 443W, 445W, or 448 ³	3 BMB 402	3
BMB, CHEM, or MICRB 400-Level Selections (Consult with an academic adviser for options) ²	4 BMB 443W or 445W ³	2
CHEM 450	3 BMB 474 ²	3

Department List C (Consult with an academic adviser for options)	5 CHEM 452	3
	General Education Course	3
	15	14

Total Credits 125

- * 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

- ¹ To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251) or Biology: Molecules and Cells (BIOL 230W), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).
- ² To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).
- ³ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.
- ⁴ BIOL 222 is an approved substitute for BIOL 322.

University Requirements and General Education Notes:

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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.

Molecular and Cell Biology Option: Biochemistry and Molecular Biology, B.S. at Commonwealth 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.

First Year

Fall	Credits	Spring	Credits
CHEM 110 ^{*#†}	3	CHEM 112 ^{*#†}	3
CHEM 111 ^{*#†}	1	CHEM 113 [†]	1
MATH 140 ^{*†#†}	4	MATH 141 ^{††}	4
BIOL 110 [†]	4	Department List C (Consult with an academic adviser for options)	4
ENGL 15, ESL 15, or ENGL 30H [†]	3	General Education Course	3
General Education Course (GHW)	1.5	General Education Course (GHW)	1.5
	16.5		16.5

Second Year

Fall	Credits	Spring	Credits
BIOL 230W ^{†1}	4	CHEM 212	3
CHEM 210	3	CHEM 213	2
PHYS 250 (Consult with an academic adviser for alternative options) [†]	4	PHYS 251 (Consult with an academic adviser for alternative options) [†]	4
General Education Course	3	STAT 200 [†]	4
CAS 100A, 100B, or 100C [†]	3	General Education Course	3
	17		16

Third Year

Fall	Credits	Spring	Credits
BMB 252 ¹	3	BMB 400 ²	2
MICRB 201 ¹	3	BMB 401 ²	3
MICRB 202	2	BMB 442	3
BIOL 222 ⁴	3	BMB 460 ²	3
General Education Course	3	General Education Course	3
Department List C (Consult with an academic adviser for options)	1	Department List C (Consult with an academic adviser for options)	1
	15		15

Fourth Year

Fall	Credits	Spring	Credits
BMB 428 ²	3	BMB 443W or 445W ³	2
BMB 430 ²	3	BMB 402 ²	3
BMB 448 or 443W ³	3	MICRB 410 ²	3
BMB or MICRB 400-Level Selection (Consult with an academic adviser for options) ²	3	BMB or MICRB 400-Level Selections (Consult with an academic adviser for options) ²	3

General Education Course	3 ENGL 202C, 202A, 202B, or 202D [†]	3
	15	14

Total Credits 125

- * 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

- ¹ To graduate, a grade of C or better is required in two of the following courses: Introductory Microbiology (MICRB 201), Molecular and Cell Biology I (BMB 251)/Molecular and Cell Biology I (MICRB 251) or Biology: Molecules and Cells (BIOL 230W), and/or Molecular and Cell Biology II (BMB 252)/Molecular and Cell Biology II (MICRB 252).
- ² To graduate, a grade of C or better is required in 9 credits of any BMB or MICRB 400-level course except those listed in the requirements for the major (consult with an academic adviser for clarification).
- ³ In order to complete degree requirements students may choose to take BMB 448 or BMB 445W. In addition, students must also take BMB 443W.
- ⁴ BIOL 222 is an approved substitute for BIOL 322.

University Requirements and General Education Notes:

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