

# MICROBIOLOGY, 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.

### General Microbiology Option, Emphasis in Cell Biology and Genetics: Microbiology, 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
First-Year Seminar	1 MICRB 201 <sup>*1</sup>	3
CHEM 110 (GN) <sup>**†</sup>	3 MICRB 202 or 203	2
CHEM 111 (GN) <sup>**†</sup>	1 CHEM 112 (GN) <sup>**†</sup>	3
MATH 140 (GQ) <sup>*†#†</sup>	4 CHEM 113 (GN) <sup>†</sup>	1
ENGL 15 or 30H (GWS) <sup>†</sup>	3 MATH 141, STAT 200, STAT 240, or STAT 250 (GQ) <sup>††8</sup>	3-4
General Education Course	3 CAS 100A, 100B, or 100C (GWS) <sup>†</sup>	3
	<b>15</b>	<b>15-16</b>

#### Second Year

Fall	Credits Spring	Credits
BMB/MICRB 251 <sup>*1,3,4</sup>	3 BMB/MICRB 252 <sup>*1,3</sup>	3
CHEM 210	3 CHEM 212	3
PHYS 211 or 250 (GN) <sup>†</sup>	4 CHEM 213W	2
Department List C <sup>9</sup>	3 PHYS 212 or 251 (GN)	4
General Education Course	3 BIOL 322 <sup>3,4</sup>	3
	<b>16</b>	<b>15</b>

#### Third Year

Fall	Credits Spring	Credits
BMB 400 <sup>*2</sup>	2 BMB 402 <sup>*2</sup>	3
BMB 401 <sup>*2</sup>	3 BMB 442	3
MICRB 401 <sup>*2</sup>	3 MICRB 415 <sup>*2,4</sup>	3
MICRB 421W	3 MICRB Elective (List A) <sup>4,5,9</sup>	3
General Education Course	3 General Education Course	3
General Education Course (GHW)	1.5 General Education Course (GHW)	1.5
	<b>15.5</b>	<b>16.5</b>

#### Fourth Year

Fall	Credits Spring	Credits
MICRB 450 <sup>*2</sup>	3 MICRB Elective (List B) <sup>5,6,7,9</sup>	0-3
PPEM 456 <sup>*2</sup>	3 Department List C <sup>9</sup>	2
MICRB Elective (List B) <sup>5,9</sup>	3 Department List C <sup>9</sup>	3
MICRB Elective (List B) <sup>5,9</sup>	3 General Education Course (GWS) <sup>††4,6</sup>	3
Department List C <sup>9</sup>	3 General Education Course	3
	General Education Course	3
	<b>15</b>	<b>14-17</b>

#### Total Credits 122-126

\* 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

<sup>1</sup> All three courses are required for the major, but a grade of C or better is required in two of the following: MICRB 201, BMB 251/MICRB 251 or BIOL 230W, BMB 252/MICRB 252 (Cell Biology and Genetics Emphasis) or BIOL 220W (Ecology Emphasis)

<sup>2</sup> To graduate, a grade of C or better is required in 9 credits of prescribed 400-level courses, excluding BMB 442 and MICRB 421W.

<sup>3</sup> Two series of courses can be taken – Cell Biology and Genetics Emphasis: BMB 251 (or BIOL 230W), BMB 252 and BIOL 322 (or BIOL 222); Cell Biology and Ecology Emphasis: BIOL 110, BIOL 230W and BIOL 220W. Students must complete either three-course series in full. No mixing courses between series.

<sup>4</sup> There may be an alternative option offered in a different semester. See adviser for more information.

<sup>5</sup> 12-credit microbiology-based elective requirement from List A (Applied) and List B (Lecture) electives, with a minimum of 3 credits taken from List A. Although, if a student wants more lab experience, more courses can be taken from List A to fulfill the requirement. A maximum of 3 credits of BMB 408/MICRB 408 and a maximum of 4 credits of BMB 488 and/or BMB 496 can be used to fulfill this requirement but will not count toward the 3-cr. minimum of List A category requirement.

<sup>6</sup> BIOL 403 or BMB 491 can double count for GWS credit and List B elective. If student does not take BIOL 403 or BMB 491, ENGL 202C/ENGL 202A/ENGL 202B/ENGL 202D can be taken instead.

<sup>7</sup> If students takes a List B elective that also satisfies GWS, then do not need additional List B credits here.

<sup>8</sup> If a student takes the course with the higher amount of credits, the extra credit can apply towards the List C elective category.

#### 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.

## General Microbiology Option, Emphasis in Cell Biology and Ecology: Microbiology, 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
First-Year Seminar	1 MICRB 201 <sup>*1</sup>	3
BIOL 110	4 MICRB 202 or 203	2
CHEM 110 (GN) <sup>**†</sup>	3 CHEM 112 (GN) <sup>**†</sup>	3
CHEM 111 (GN) <sup>**†</sup>	1 CHEM 113 (GN) <sup>†</sup>	1
MATH 140 (GQ) <sup>**††</sup>	4 MATH 141, STAT 200, STAT 240, or STAT 250 (GQ) <sup>††8</sup>	3-4
ENGL 15 or 30H (GWS) <sup>‡</sup>	3 CAS 100A, 100B, or 100C (GWS) <sup>‡</sup>	3
	<b>16</b>	<b>15-16</b>

### Second Year

Fall	Credits Spring	Credits
BIOL 220W <sup>*1,3,4</sup>	4 BIOL 230W <sup>*1,3</sup>	4
CHEM 210	3 CHEM 212	3
PHYS 211 or 250 (GN) <sup>†</sup>	4 CHEM 213W	2
Department List C <sup>9</sup>	3 PHYS 212 or 251 (GN)	4
General Education Course	3 General Education Course	3
	<b>17</b>	<b>16</b>

### Third Year

Fall	Credits Spring	Credits
BMB 400 <sup>*2</sup>	2 BMB 402 <sup>*2</sup>	3
BMB 401 <sup>*2</sup>	3 BMB 442	3
MICRB 401 <sup>*2</sup>	3 MICRB 415 <sup>*2,4</sup>	3
MICRB 421W	3 MICRB Elective (List A) <sup>4,5,9</sup>	3
General Education Course	3 General Education Course	3
General Education Course (GHW)	1.5 General Education Course (GHW)	1.5
	<b>15.5</b>	<b>16.5</b>

### Fourth Year

Fall	Credits Spring	Credits
MICRB 450 <sup>*2</sup>	3 MICRB Elective (List B) <sup>5,9</sup>	3
PPEM 456 <sup>*2</sup>	3 MICRB Elective (List B) <sup>5,9</sup>	3
MICRB Elective (List B) <sup>5,6,7,9</sup>	0-3 Department List C <sup>9</sup>	2
Department List C <sup>9</sup>	3 Department List C <sup>9</sup>	3
General Education Course (GWS) <sup>††4,6</sup>	3 General Education Course	3
General Education Course	3	
	<b>15-18</b>	<b>14</b>

### Total Credits 125-129

\* 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

<sup>1</sup> All three courses are required for the major, but a grade of C or better is required in two of the following: MICRB 201, BMB 251/MICRB 251 or BIOL 230W, BMB 252/MICRB 252 (Cell Biology and Genetics Emphasis) or BIOL 220W (Ecology Emphasis)

<sup>2</sup> To graduate, a grade of C or better is required in 9 credits of prescribed 400-level courses, excluding BMB 442 and MICRB 421W.

<sup>3</sup> Two series of courses can be taken – Cell Biology and Genetics Emphasis: BMB 251 (or BIOL 230W), BMB 252 and BIOL 322 (or BIOL 222); Cell Biology and Ecology Emphasis: BIOL 110, BIOL 230W and BIOL 220W. Students must complete either three-course series in full. No mixing courses between series.

<sup>4</sup> There may be an alternative option offered in a different semester. See adviser for more information.

<sup>5</sup> 12-credit microbiology-based elective requirement from List A (Applied) and List B (Lecture) electives, with a minimum of 3 credits taken from List A. Although, if a student wants more lab experience, more courses can be taken from List A to fulfill the requirement. A maximum of 3 credits of BMB 408/MICRB 408 and a maximum of 4 credits of BMB 488 and/or BMB 496 can be used to fulfill this requirement but will not count toward the 3-cr. minimum of List A category requirement.

<sup>6</sup> BIOL 403 or BMB 491 can double count for GWS credit and List B elective. If student does not take BIOL 403 or BMB 491, ENGL 202C/ENGL 202A/ENGL 202B/ENGL 202D can be taken instead.

<sup>7</sup> If students takes a List B elective that also satisfies GWS, then do not need additional List B credits here.

<sup>8</sup> If a student takes the course with the higher amount of credits, the extra credit can apply towards the List C elective category.

<sup>9</sup> Consult with an academic adviser for options.

### 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.

## Medical Microbiology Option: Microbiology, 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
First-Year Seminar	1 MICRB 201 <sup>*1</sup>	3
CHEM 110 (GN) <sup>**†</sup>	3 MICRB 202 or 203	2
CHEM 111 (GN) <sup>**†</sup>	1 CHEM 112 (GN) <sup>**†</sup>	3
MATH 140 (GQ) <sup>*†#†</sup>	4 CHEM 113 (GN) <sup>†</sup>	1
ENGL 15 or 30H (GWS) <sup>‡</sup>	3 MATH 141, STAT 200, STAT 240, or STAT 250 (GQ) <sup>††8</sup>	3-4
General Education Course	3 CAS 100A, 100B, or 100C (GWS) <sup>‡</sup>	3
	<b>15</b>	<b>15-16</b>

### Second Year

Fall	Credits Spring	Credits
BMB/MICRB 251 <sup>*1,3</sup>	3 BMB/MICRB 252 <sup>*1</sup>	3
CHEM 210	3 CHEM 212	3
PHYS 211 or 250 (GN) <sup>†</sup>	4 CHEM 213W	2
Department List C <sup>9</sup>	3 PHYS 212 or 251 (GN)	4
General Education Course	3 BIOL 322 <sup>3</sup>	3
	<b>16</b>	<b>15</b>

### Third Year

Fall	Credits Spring	Credits
BMB 401 <sup>*2</sup>	3 BMB 400 <sup>*2</sup>	2
MICRB 410 <sup>*2,3</sup>	3 BMB 402 <sup>*2</sup>	3
MICRB 421W	3 BMB 442	3
MICRB 450 <sup>*2</sup>	3 Department List C <sup>9</sup>	3
General Education Course	3 General Education Course	3
General Education Course (GHW)	1.5 General Education Course (GHW)	1.5
	<b>16.5</b>	<b>15.5</b>

### Fourth Year

Fall	Credits Spring	Credits
MICRB 401 <sup>*2</sup>	3 MICRB 412 <sup>*2</sup>	3
PPEM 456 <sup>*2</sup>	3 MICRB 415 <sup>*2,3</sup>	3
MICRB Elective (List B) <sup>4,7</sup>	0-3 MICRB Elective (List A) <sup>3,4</sup>	3
Department List C <sup>9</sup>	2 Department List C <sup>9</sup>	3
General Education Course (GWS) <sup>††,5</sup>	3 General Education Course	3
General Education Course	3	
	<b>14-17</b>	<b>15</b>

### Total Credits 122-126

\* 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

<sup>1</sup> All three courses are required for the major, but a grade of C or better is required in two of the following: MICRB 201, BMB 251/MICRB 251 or BIOL 230W, BMB 252/MICRB 252.

<sup>2</sup> To graduate, a grade of C or better is required in 9 credits of prescribed 400-level courses, excluding BMB 442 and MICRB 421W.

<sup>4</sup> There may be an alternative option offered in a different semester. See adviser for more information.

<sup>5</sup> 6-credit microbiology-based elective requirement (List B electives). A maximum of 3 credits of BMB/MICRB, BMB 488 and/or BMB 496 can be used to fulfill this requirement.

<sup>6</sup> BIOL 403 or BMB 491 can double count for GWS credit and List B elective. If student does not take BIOL 403 or BMB 491, ENGL 202C/ENGL 202A/ENGL 202B/ENGL 202D can be taken instead.

<sup>7</sup> If students takes a List B elective that also satisfies GWS, then do not need additional List B credits here.

<sup>8</sup> When a range of credits is listed for the GQ courses, if a student takes a course with the higher amount of credits, the extra credit can apply towards the List C elective category.

<sup>9</sup> Consult with an academic adviser for options.

### 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.