Molecular Cloning
Laboratory in Proteins, Nucleic Acids, and Molecular Cloning

CHEM 113  Experimental Chemistry II  1
CHEM 210  Organic Chemistry I  3
CHEM 212  Organic Chemistry II  3
CHEM 213  Laboratory in Organic Chemistry  2
MATH 141  Calculus with Analytic Geometry II  4
MICRB 201  Introductory Microbiology  3
MICRB 202  Introductory Microbiology Laboratory  2
MICRB 251  Molecular and Cell Biology I  3
MICRB 252  Molecular and Cell Biology II  3
MICRB 421W  Laboratory of General and Applied Microbiology  3
PHYS 250  Introductory Physics I  4
PHYS 251  Introductory Physics II  4
PSU 16  First-Year Seminar Science  1

Prescribed Courses: Require a grade of C or better
CHEM 110  Chemical Principles I  3
CHEM 111  Experimental Chemistry I  1
CHEM 112  Chemical Principles II  3
MATH 140  Calculus With Analytic Geometry I  4

Additional Courses
Select four of the following: 11-12
MICRB 401  Microbial Physiology and Structure
MICRB 410  Principles of Immunology
MICRB 412  Medical Microbiology
MICRB 415  General Virology: Bacterial and Animal Viruses
MICRB 450  Microbial/Molecular Genetics

Select 3-4 credits of the following: 3-4
BMB 445W  Laboratory in Molecular Genetics I
BMB 448  Model Systems and Approaches in Cell Biology Inquiry
MICRB 422  Medical Microbiology Laboratory
MICRB 447  Laboratory in Molecular Immunology

Select 6-7 credits of the following:  6-7
BMB 408  Instructional Practice
BMB 488  Communities of Practice in Biochemistry and Molecular Biology
BMB 496  Independent Studies
FDSC 408  Food Microbiology
Any other MICRB 400-level course

Supporting Courses and Related Areas
Select 8-10 credits from department list  8-10

1 To graduate, a grade of C or better is required in two of the following courses:
   • MICRB 201
   • BMB 251/MICRB 251
   • BMB 252/MICRB 252

2 With a total maximum of 3 credits in BMB 408 and/or MICRB 408 and a maximum of 4 credits in BMB 488 and/or BMB 496.

Note: A student enrolled in an ROTC program may, after consultation with the head of the microbiology program, substitute up to 6 credits of ROTC in the categories of Additional Courses and Supporting Courses and Related Areas.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required.)
   • Quantification (GQ): 6 credits
   • Writing and Speaking (GWS): 9 credits
Knowledge Domains
• Arts (GA): 6 credits
• Health and Wellness (GHW): 3 credits
• Humanities (GH): 6 credits
• Social and Behavioral Sciences (GS): 6 credits
• Natural Sciences (GN): 9 credits

Integrative Studies (may also complete a Knowledge Domain requirement)
• Inter-Domain or Approved Linked Courses: 6 credits

University Degree Requirements
First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement
6 credits are required and may satisfy other requirements
• United States Cultures: 3 credits
• International Cultures: 3 credits

Writing Across the Curriculum
3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.