PENN STATE UNIVERSITY | EBERLY COLLEGE OF SCIENCE
EFFECTIVE FALL 2018 OR LATER

B.S. in BIOCHEMISTRY AND MOLECULAR BIOLOGY
MOLECULAR & CELL BIOLOGY OPTION

Check the schedule of courses for complete list of courses taught each semester.

Mathematical Sciences - List B

Select 2-4 units

- CMPSC 101 (GQ) Introduction to C++ Programming, 3 units
- CMPSC 102, Introduction to Visual Programming, 3 units
- CMPSC 121 (GQ) Introduction to Programming Techniques, 3 units
- CMPSC 200 (GQ) Programming for Engineers with MATLAB, 3 units
- CMPSC 201 (GQ) Programming for Engineers with C++, 3 units
- MATH 220 (GQ) Matrices, 2 units
- MATH 230 Calculus and Vector Analysis, 4 units
- MATH 231 Calculus of Several Variables, 2 units
- MATH 250 Ordinary Differential Equations, 3 units
- MATH 251 Ordinary and Partial Differential Equations, 4 units
- STAT 200(GQ) Elementary Statistics, 4 units
- STAT 240 (GQ) Introduction to Biometry, 3 units
- STAT 250 (GQ) Introduction to Biostatistics, 3 units
- STAT 301 (GQ) Statistical Analysis I, 3 units
- STAT 401 Experimental Methods, 3 units

400 - Level Selections

Select 5-6 units from the following courses with a total maximum of 4 units in BMB 488 and/or BMB 496 and a total maximum of 3 units in BMB 408.

- BMB 411 Survey of Biochemistry and Molecular Biology Literature, 1 unit
- BMB/MICRB/VBSC 432 Advanced Immunology: Signaling and the Immune System, 3 units
- BMB/MICRB/VBSC 433 Molecular and Cellular Toxicology, 3 units
- BMB/MICRB/VBSC 435 Viral Pathogenesis, 3 units
- BMB/MICRB 450 Microbial/Molecular Genetics, 2 units
- BMB 464 Molecular Medicine, 3 units
- BMB 474 Analytical Biochemistry, 3 units
- BMB/MICRB 480 Tumor Viruses and Oncogenes, 3 units
- BMB 484 Functional Genomics, 3 units
- BMB 497 Bioinformatics, 3 units
- MICRB 401 Microbial Physiology and Structure, 3 units
- MICRB 411 Survey of Microbiology Literature, 1 unit
- MICRB 412 Medical Microbiology, 3 units
- MICRB 413 Microbial Diversity, 2 units
- MICRB 415 General Virology: Bacterial and Animal Viruses, 3 units
- MICRB/BIOIOTC 416 Microbial Biotechnology, 2 units
- MICRB 421W Laboratory of General and Applied Microbiology, 3 units
- MICRB 422 Medical Microbiology Laboratory, 2 units
- MICRB 447 Laboratory in Molecular Immunology, 1 unit
Check the schedule of courses for complete list of courses taught each semester.

**400 - Level Selections - List D**

In addition to 400-level BMB and MICRB courses, the following courses will also be allowed as 400-level selections for this major.

- BIOL 405 Molecular Evolution, 3 units
- BIOL 416 Biology of Cancer, 3 units
- BIOL 422 Advanced Genetics, 3 units
- BIOL 426 Developmental Neurobiology, 3 units *(Prerequisite: BIOL 141 or BIOL 240)*
- BIOL 431 Biology of Reproduction, 3 units
- BIOL 432 Developmental Genetics, 3 units
- BIOL 443 Evo-devo: Evolution of Developmental Mechanisms, 3 units *(Prerequisite: BIOL 240)*
- BIOL 451 The Biology of RNA, 3 units
- BIOL/ANTH 460 Human Genetics, 3 units *(Prerequisite: ANTH 021 or BIOL 110 or BIOL 133 or by permission)*
- BIOL/BBH 469 Neurobiology, 3 units *(Prerequisite: BIOL 240)*
- BIOL/BBH 470 Functional and Integrative Neurosciences, 3 units *(Prerequisite: BIOL 469)*
- BIOL/GEOSC 474 Astrobiology, 3 units *(Prerequisites: BIOL 110 and CHEM 110)*

**Free Electives - List C**

With the EXCEPTION of the courses listed below, ALL courses appearing in the University Bulletin are acceptable as elective courses: 6 units of ROTC may be applied toward graduation requirements

Students MAY NOT fulfill this requirement with lower level or general education courses in math and science (including but not limited to examples such as any BISC course, any BMB course below the 100 level, MATH 110 and 111, and the like).

Students MAY NOT fulfill this requirement with courses that significantly repeat material from courses required for the major (including but not limited to examples such as: CHEM 202 or 203 after taking CHEM 210 or 212, or vice-versa: PHYS 250 or 251 after taking PHYS 211, 212, 213, and 214, or vice versa; and so forth).

Students MAY NOT fulfill this requirement with remedial courses (including but not limited to examples such as LL ED 5 and 10; ENGL 4, 5, and 6; ESL 4 and 5; CHEM courses below CHEM 110; MATH courses below MATH 110; STAT 100; PHYS courses below PHYS 211; and the like).