

Name:

Campus ID:

**Bachelor of Science - Biochemistry and Molecular Biology Requirements (BIOC)**  
79-82 credits

<b>Biology (18 credits; 10 upper-level)</b>	<b>Pre-requisites</b>	<b>Cr.</b>	<b>Semesters Offered</b>	<b>Semester Taken</b>	<b>Grade</b>
BIOL 141 - Foundations of Biology: Cells, Energy & Organisms *	MATH 150 or higher or placement in MATH151	4	FSZ		
BIOL 142 - Foundations of Biology: Ecology and Evolution*	MATH 150 or higher or placement in MATH151; BIOL 141	4	FSZ		
BIOL 302 - Molecular and General Genetics*	MATH 150 or higher or placement in MATH151; BIOL 141; BIOL 142; CHEM 101/123; CHEM 102/124 (co-req)	4	FSZ		
BIOL 303 - Cell Biology	MATH 150 or higher or placement in MATH151; BIOL 141; BIOL 142; BIOL302; CHEM 102	4	FSZ		
BIOL 300L - Experimental Biology Laboratory	MATH 150 or higher or placement in MATH151; BIOL 141; BIOL 142; BIOL 302; CHEM 102; CHEM 102L	2	FSZ		
<b>Chemistry (27-28 credits; 17-18 upper-level)</b>					
CHEM 101 - Principles of Chemistry I*	MATH 106 or higher	4	FSZ		
CHEM 102 - Principles of Chemistry II*	CHEM 101	4	FSZ		
CHEM 102L - Introductory Chemistry Lab I*	CHEM 101; CHEM 102 (pre/co-req)	2	FSZ		
CHEM 300 - Analytic Chemistry*	CHEM 102; CHEM 102L	4	FS		
CHEM 301 - Physical Chemistry I OR	CHEM 102; MATH 152; PHYS 122 (pre/co-req)	4	F		
CHEM 303 - Physical Chemistry for the Biochemical Sciences	CHEM 351; MATH 152; PHYS 112/122 (pre-/co-req)	3	S		
CHEM 351 - Organic Chemistry I*	CHEM 102	3	FSZ		
CHEM 351L - Organic Chemistry Lab I*	CHEM 102; CHEM 102L; CHEM 351 (pre-/co-req)	2	FSZ		
CHEM 352 - Organic Chemistry II*	CHEM 102; CHEM 351	3	SZ		
CHEM 352L - Organic Chemistry Lab II*	CHEM 102L; CHEM 351; CHEM 351L; CHEM 352 (pre-/co-req)	2	SZ		
<b>Biochemistry (12 credits; all upper-level)</b>					
CHEM 437 - Comprehensive Biochemistry I*	CHEM 352	4	F		
CHEM 437L - Biochemistry Laboratory* (WI)	CHEM 351L; CHEM 300; CHEM 437 (pre-/co-req); ENGL 100	4	FS		
CHEM 438 - Comprehensive Biochemistry II*	CHEM 437	4	S		
<b>Upper-Level Electives (list on reverse side of this sheet) (6-8 credits; all upper level)</b>					
<b>Physics and Math (16 credits)</b>					
MATH 151 - Calculus & Analytical Geometry I*	MATH 150	4	FSZ		
MATH 152 - Calculus & Analytical Geometry II*	MATH 151	4	FSZ		
PHYS 121 - Introductory Physics I*	MATH 151 (pre-/co-req)	4	FSZ		
PHYS 122 - Introductory Physics II*	PHYS121; MATH 152 (pre-/co-req)	4	FSZ		
Individual Research 1-4 credits (recommended) Students have the opportunity to integrate what they have learned by doing research with participating faculty. Those working with a Biological Sciences faculty member may register for BIOL 399 or 499. Those working in a Chemistry and Biochemistry departmental faculty laboratory may register for CHEM 399 or 499.					

\* These courses must be completed with a grade of "C" or better. All courses that students take as pre-requisites for other courses must be passed with a "C" or better. An overall "C" average must be maintained in required major courses.

F = Fall, S = Spring, Z = Summer. Courses marked with a "Z" have been taught in the Summer in recent years; there is no guarantee that they will be offered ever Summer.

(WI) - Writing Intensive

**Electives List (from the 2019-2020 General Catalog with additional approved courses):**

- BIOL 411 - Bacterial Physiology
- BIOL 414 - Eukaryotic Genetics & Molecular Biology
- BIOL 418 - Human Molecular Biology
- BIOL 420 - Advanced Topics in Cell Biology
- BIOL 421 - Topics in Molecular Genetics
- BIOL 425 - Immunology
- BIOL 426 - Approaches to Molecular Biology
- BIOL 428 - Computer Applications in Molecular Biology
- BIOL 429 - Advanced Topics in Molecular Biology
- BIOL 434 - Microbial Molecular Genetics
- BIOL 443 - Advanced Topics in Developmental Biology
- BIOL 444 - Development and Cancer
- BIOL 445 - Signal Transduction
- BIOL 451 - Neurobiology
- BIOL 454 - Vision Science
- BIOL 456 - Plant Molecular Biology
- BIOL 470 - General Virology
- BIOL 476 - Antibiotics: Origin, Mechanism, Resistance
- BIOL 483 - Evolution: From Genes to Genomes
- BIOL 486 - Genome Science
- CHEM 406 - Bioinorganic Chemistry
- CHEM 431 - Chemistry of Proteins
- CHEM 432 - Advanced Biochemistry
- CHEM 433 - Biochemistry of Nucleic Acids
- CHEM 435 - Biochemistry of Complex Carbohydrates
- CHEM 441 - Physical Chemistry of Macromolecules
- CHEM 442 - Physical Biochemistry
- CHEM 443 - Spectroscopy of Biopolymers
- CHEM 444 - Molecular Modeling
- CHEM 450 - Chemistry of Heterocyclic Compounds
- CHEM 451 - Mechanisms of Organic Reactions
- CHEM 453 - Organic Chemistry of Nucleic Acids
- CHEM 455 - Biomedical Chemistry
- CHEM 457 - Total Synthesis of Natural Products
- CHEM 461 - Advanced Instrumental Methods of Analysis
- CHEM 470 - Toxicological Chemistry
- CHEM 472 - Enzyme Reaction Mechanisms
- CHEM 490A - Special Topics in Chemistry\*\*
- CHEM 601 - Special Topics in Chemistry\*\*
- CHEM 601 - Special Topics in Chemistry: Advanced NMR Spectroscopy\*\*
- CHEM 635 - Biochemistry of Complex Carbohydrates
- CHEM 640 - Special Topics in Molecular Structure
- CHEM 670 - Special Topics in Dynamics and Mechanism\*\*
- CHEM 680 - Seminar in Biophysical Chemistry
- CHEM 682 - Current Topics in Biochemistry
- CHEM 684 - Special Topics in Chemistry\*\*
- CHEM 684A - Special Topic: Organic Spectroscopy\*\*

\*\* Special Topics course that may be approved as electives in those years when their topic is appropriate (subject to confirmation by the Biochemistry Undergraduate Committee)\*\*

NOTE: Not all courses in this list are offered on a regular basis. Always consult the UMBC Schedule of Classes for exact course offerings and plan accordingly.