Bachelor of Arts in Biology Education (BIOE) Requirements

BIOL 141 - Foundations of Biology: Cells, Energy, Organism MATH 150 or higher or placement in MATH151 BIOL 142 - Foundations of Biology: Ecology & Evolution MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, CHEM 101, CHEM 102 (pre- or co-requisite) BIOL 302 - Molecular & General Genetics MATH 150 or higher or placement in MATH151, BIOL 142, CHEM 101, CHEM 102 (pre- or co-requisite) BIOL 303 - Cell Biology MATH 150 or higher or placement in MATH151, BIOL 142, CHEM 102, Organ CHEM 102, CHEM 102, Organ CHEM 102, BIOL 303 - Cell Biology Laboratory BIOL 141, BIOL 142, BIOL 302, and CHEM 102, CHEM 1	BIOLOGY COURSES	Pre-requisites	Cr.
BIOL 142 - Fountactions of Bology, Ecology & Evolution BIOL 302 - Molecular & General Genetics BIOL 303 - Molecular & General Genetics BIOL 303 - Cell Biology MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, CHEM 101, CHEM 102 (pre- or co-requisite) BIOL 303 - Cell Biology BIOL 300L - Experimental Biology Laboratory BIOL 300L - Experimental Biology Laboratory BIOL 302L - Molecular and General Genetics Lab BIOL 302L - Molecular and General Genetics Lab BIOL 305 - Comparative Animal Physiology BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, PHYS 112 (pre- or co-requisite) BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, consult catalog for other prereqs CHEMISTRY COURSES CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 101 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 103 - Organic Chemistry II CHEM 104 - Organic Chemistry II CHEM 105 - Physical Geography GES 311 - Physical Geography GES 311 - Weather and Climate MATH 155 - Elementary Calculus I PHYS 111 - Basic Physics II STAT 350 - Statistics w Application in Biological Sciences GENERAL EDUCATION REQUIREMENT COURSES PSYC 100 - Introduction to Psychology (SS) PSYC 210 - Psychological Foundations of Education EDUC 311 - Psychological Foundations of Education EDUC 310 - Inquiry Into Education EDUC 411 - Teaching Reading in the Content Area I dept consent, EDUC 412 EDUC 411 - Teaching Reading in the Content Area I EDUC 412, dept consent, co-enroll in EDUC 411 EDUC 456 - Student Teaching in Secondary	BIOL 141 - Foundations of Biology: Cells, Energy, Organism:	MATH 150 or higher or placement in MATH151	4
BIOL 302 - Molecular & General Genetics BIOL 303 - Cell Biology BIOL 303 - Cell Biology BIOL 303 - Cell Biology BIOL 300L - Experimental Biology Laboratory BIOL 300L - Experimental Biology Laboratory BIOL 300L - Experimental Biology Laboratory BIOL 301L - Molecular and General Genetics Lab BIOL 302L - Molecular and General Genetics Lab BIOL 303, PHYS 112 (pre- or co-requisite) BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4X7 - Choose either BIOL 411, BIOL 414, BIOL 439, PHYS 112 (pre- or co-requisite) BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4X7 - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, PHYS 112 (pre- or co-requisite) BIOL 303, PHYS 112 (pre- or co-requisite) BIOL 4X7 - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, changit catalog for other preregs CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 101 - Original Chemistry I CHEM 102 - Principles of Chemistry I CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry I CHEM 102 - Principles of Chemistry I CHEM 103 - Organic Chemistry I CHEM 104 - Physical Geography GES 311 - Weather and Climate GES 110 - Physical Geography GES 311 - Weather and Climate GES 110 - MATH 106 or higher, or Math test score of 4 or 5 PHYS 111 - Basic Physics I PHYS 112 - Basic Physics II PHYS 111 - Basic Physics II PHYS 111 - Basic Physics II PHYS 111 - Physical Geography GEN 311 - Psychology of Learning (SS) PSYC 100 - Introduction to Psychology (SS) PSYC 100 - Inquiry into Education EDUC 310 - Inquiry into Education EDUC 310 - Inquiry into Education EDUC 311 - Psychological Foundations of Education EDUC 312 - Psychological Foundations of Education EDUC 310 - Inquiry into Education EDUC 310 - EDUC 311 - General Reading in the Content Area II EDUC 412 - dept consent, co-	BIOL 142 - Foundations of Biology: Ecology & Evolution	BIOL 141	4
BIOL 303 - Cell Biology BIOL 141, BIOL 142, BIOL 302, CHEM 102, MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, BIOL 302, CHEM 102, MATH 150 or higher or placement in MATH151, BIOL 302, CHEM 102, CHEM 102L BIOL 302L - Molecular and General Genetics Lab BIOL 302L - Molecular and General Genetics Lab BIOL 305 - Comparative Animal Physiology BIOL 307 - Ethics and Integrity in Scientiffic Research BIOL 307 - Ethics and Integrity in Scientiffic Research BIOL 307 - Ethics and Integrity in Scientiffic Research BIOL 308, PHYS 112 (pre- or co-requisite) BIOL 309, PHYS 112 (pre- or co-requisite) BIOL 303, consult catalog for other prereqs CHEMISTRY COURSES CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 101 - CHEM 102 (pre- or co-requisite) CHEM 102 - Introductory Chemistry Laboratory I CHEM 103 - CHEM 104 (pre- or co-requisite) CHEM 104 - Physical Geography GES 311 - Weather and Climate GES 110 - Physical Geography GES 311 - Weather and Climate MATH 150 or higher, or Math test score of 4 or 5 PHYS 111 - Basic Physics I PHYS 111 - Basic Physics I PHYS 112 - Basic Physics I PHYS 111 - Basic Physics I PHYS 111 - Basic Physics I PHYS 111 - Psychology of Learning (SS) PSYC 100 - Introduction to Psychology (SS) PSYC 101 - Inquiry into Education EDUC 311 - Psychology of Learning (SS) EDUC 310 - Inquiry into Education EDUC 311 - Psychological Foundations of Education EDUC 311 - Psychological Foundations of Education EDUC 311 - Psychological Foundations of Education EDUC 412 - Analysis of Teaching and Learning EDUC 410 - Teaching Reading in the Content Area I EDUC 411 - Teaching Reading in the Content Area I EDUC 412 - Application to the Secondary School EDUC 413 - Application to EDUC 415 EDUC 414 - Centrol in EDUC 415	BIOL 302 - Molecular & General Genetics	BIOL 141, BIOL 142, CHEM 101,	4
BIOL 300L - Experimental Biology Laboratory CHEM 102L BIOL 302L - Molecular and General Genetics Lab BIOL 303C - Molecular and General Genetics Lab BIOL 305 - Comparative Animal Physiology BIOL 307 - Ethics and Integrity in Scientific Research BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 CHEMISTRY COURSES CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 102 - Principles of Chemistry II CHEM 101 - CHEM 101 CHEM 102 - Principles of Chemistry Laboratory I CHEM 101 - Principles of Chemistry I CHEM 101 - Organic Chemistry I CHEM 102 - Principles of Chemistry I CHEM 103 - Organic Chemistry I CHEM 104 - Organic Chemistry I CHEM 105 - Organic Chemistry I CHEM 106 or higher, or Math test score of 4 or 5 CHEM 107 - Physical Geography GES 311 - Weather and Climate GES 110 - Physical Geography GES 311 - Weather and Climate MATH 155 - Elementary Calculus I PHYS 111 - Basic Physics I PHYS 111 - Basic Physics I PHYS 112 - Basic Physics I PHYS 110 - Psychology of Learning (SS) GENERAL EDUCATION REQUIREMENT COURSES PSYC 100 - Introduction to Psychology (SS) PSYC 210 - Psychology of Learning (SS) EDUCATION COURSES EDUC 310 - Inquiry into Education EDUC 381 - Inclusion and Instruction EDUC 381 - Inclusion and Instruction EDUC 311 - Psychological Foundations of Education EDUC 412 - Analysis of Teaching and Learning EDUC 410 - Teaching Reading in the Content Area I EDUC 410 - General Reading in the Content Area I EDUC 411 - Teaching Reading in the Content Area I EDUC 412, dept consent, co-enroll in EDUC 411 EDUC 456 - Student Teaching in Secondary Schools dept consent, co-enroll in EDUC 457	BIOL 303 - Cell Biology	MATH 150 or higher or placement in MATH151,	4
BIOL 305 - Comparative Animal Physiology BIOL 307 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, consult catalog for other prereqs CHEMISTRY COURSES CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 102 - Introductory Chemistry Laboratory I CHEM 103 - Organic Chemistry I OTHER STEM COURSES GES 110 - Physical Geography GES 311 - Weather and Climate MATH 105 or higher, or Math test score of 4 or 5 PHYS 111 - Basic Physics I PHYS 111 - Basic Physics II STAT 350 - Statistics w Application in Biological Sciences GENERAL EDUCATION REQUIREMENT COURSES PSYC 100 - Introduction to Psychology (SS) PSYC 210 - Psychology of Learning (SS) EDUC 311 - Psychological Foundations of Education EDUC 312 - Analysis of Teaching and Learning EDUC 412 - Analysis of Teaching and Learning EDUC 411 - Teaching Reading in the Content Area I EDUC 412, dept consent, co-enroll in EDUC 411 EDUC 456 - Student Teaching in Secondary Schools BDUC 457 - Student Teaching in Secondary Schools	BIOL 300L - Experimental Biology Laboratory	BIOL 141, BIOL 142, BIOL 302, CHEM 102,	2
BIOL 397 - Ethics and Integrity in Scientific Research BIOL 4XX - choose either BIOL 411, BIOL 414, or BIOL 434 BIOL 303, consult catalog for other prereqs CHEMISTRY COURSES CHEM 101 - Principles of Chemistry I CHEM 102 - Principles of Chemistry II CHEM 101 CHEM 102 - Principles of Chemistry Laboratory I CHEM 101 CHEM 102 - Introductory Chemistry Laboratory I CHEM 101, CHEM 102 (pre- or co-requisite) CHEM 351 - Organic Chemistry I OTHER STEM COURSES GES 110 - Physical Geography GES 311 - Weather and Climate MATH 155 - Elementary Calculus I PHYS 111 - Basic Physics I PHYS 112 - Basic Physics I PHYS 112 - Basic Physics II STAT 350 - Statistics w Application in Biological Sciences PSYC 100 - Introduction to Psychology (SS) PSYC 210 - Psychology of Learning (SS) PSYC 210 - Psychology of Learning (SS) PSYC 210 - Psychological Foundations of Education EDUC 311 - Psychological Foundations of Education EDUC 311 - Teaching Reading in the Content Area I EDUC 412 - Analysis of Teaching and Learning EDUC 411 - Teaching Reading in the Content Area I EDUC 417 - Science in the Secondary School EDUC 412, dept consent, co-enroll in EDUC 411 EDUC 456 - Student Teaching in Secondary Schools EDUC 412, dept consent, co-enroll in EDUC 411	BIOL 302L - Molecular and General Genetics Lab	BIOL 300L, BIOL 302	2
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EDUC 411 - Teaching Reading in the Content Area II EDUC 427 - Science in the Secondary School EDUC 456 - Student Teaching in Secondary Schools EDUC 410, dept consent EDUC 410, dept consent EDUC 411 dept consent, co-enroll in EDUC 411 dept consent, co-enroll in EDUC 457	EDUC 412 - Analysis of Teaching and Learning	EDUC 310, EDUC 311, dept consent (2.75 GPA)	3
EDUC 427 - Science in the Secondary School EDUC 412, dept consent, co-enroll in EDUC 411 EDUC 456 - Student Teaching in Secondary Schools dept consent, co-enroll in EDUC 457	EDUC 410 - Teaching Reading in the Content Area I	dept consent, EDUC 412	3
EDUC 456 - Student Teaching in Secondary Schools dept consent, co-enroll in EDUC 457	EDUC 411 - Teaching Reading in the Content Area II	EDUC 410, dept consent	3
	EDUC 427 - Science in the Secondary School	EDUC 412, dept consent, co-enroll in EDUC 411	3
EDUC 457 - Secondary Internship Seminar dept consent	EDUC 456 - Student Teaching in Secondary Schools	dept consent, co-enroll in EDUC 457	10
	EDUC 457 - Secondary Internship Seminar	dept consent	2

University requirements (EN, GEP, etc) are not shown

See Important Notes on Other Side!

Bachelor of Arts in Biology Education (BIOE) Requirements

Important Notes:

- 1) Students must earn a "C" or better in all major courses AND course prerequisites.
- 2) At least half of the required BIOL courses and electives must be completed in residence: for the BIOE major at least <u>five of nine BIOL classes must be taken at UMBC.</u>
- 3) BIOL 141, BIOL 142 and BIOL 302 are considered an academic sequence. Once you pass BIOL 302 you may not go back and repeat BIOL 141 or BIOL 142.
- 4) BIOE majors must use PSYC 100 and PSYC 210 as two of three Social Science electives for the General Education Requirements.
- 5) BIOL 495, 497, 499, and Lab classes may NOT be used to fulfill the BIOL 4XX Elective. The BIOL 4XX elective class (BIOL 411,414 or 434) must be taken at UMBC.
- 6) Courses equivalent to EDUC 310, EDUC 311 and EDUC 388 may be taken elsewhere, but EDUC 412 and beyond must be taken at UMBC.
- 7) Before enrolling in EDUC 412, students must complete an 'Application to Program' form from the Education department and must have a GPA of 2.75 or greater.
- 8) Before students can participate in field teaching, they must complete an 'Application to Internship' form from the Education department. Students apply in the Spring semester before their teaching; teaching begins in the Fall semester, but students register for EDUC 456 only in the following Spring semester.
- 9) Students may not pursue both a BIOE and BIOL degree since the BIOE degree contains the BIOL curriculum within it.
- 10) Students who are BIOC (Biochemistry and Molecular Biology) majors who wish to also pursue a BIOE degree may use Core BIOL, CHEM, MATH and PHYS courses from the BIOC major towards the BIOE degree, but MUST take <u>separate electives for the two degrees</u> (ie., no 'double-dipping for the electives). Please note, the university requires students taking two different Bachelor's degrees (like the BA and BS) to take a total of 150 credits.
- 11) Under exceptional circumstances, the Department may waive or alter a BIOL major requirement. Students seeking to petition for a waiver must consult with their academic adviser, then may submit a 'Petition for Waiver/Substitution of Program Requirements' form, found here: https://biology.umbc.edu/undergrad/forms-links/.
- 12) The Biological Sciences Department evaluates completion of major requirements based on COURSES completed, not CREDITS completed, because equivalent courses taken elsewhere may not be the same number of credits as the UMBC course they replace.