

UMBC UGC Program Changes & Other Request: Biological Sciences, B.S. Degree: Elective Changes

Date Submitted: 9/16/2019

Proposed Effective Date: Spring 2020

	Name	Email	Phone	Dept
Dept Chair	Philip Farabaugh	farabaug@umbc.edu	53018	BIOL
UPD	David Eisenmann	eisenman@umbc.edu	52256	BIOL
Other Contact	Nichole Zang Do	Zang.do@umbc.edu	58071	BIOL

Specifics (see instructions):

Current BIOL Core Courses

BIOL 141 (or BIOL 141H)	Foundations of Biology
BIOL 142	Foundations of Biology: Ecolog
BIOL 300L	Experimental Biology Lab
BIOL 302	Molecular & General Genetics
BIOL 303	Cell Biology

Proposed Core Courses

BIOL 141 (or BIOL 141H)	Foundations of Biology
BIOL 142	Foundations of Biology: Ecolog
BIOL 300L	Experimental Biology Lab
BIOL 302	Molecular & General Genetics
BIOL 303 or BTEC 303	Cell Biology or Applied Cell Biology

BIOL Electives: Students must choose one course from Column A, one course from Column B, one course from Column A or B, and one BIOL 400-level course in Column B

Current Column A Electives

BIOL 275	Microbiology
BIOL 304	Plant Biology
BIOL 305	Comp. Animal Physiology
BIOL 306	Molecular Biology
BIOL 307	Human Physiology
BIOL 313	Bioinformatics Intro
BIOL 430	Biological Chemistry
BIOL 442	Developmental Biology

Proposed Column A Electives

BIOL 275	Microbiology
BIOL 304	Plant Biology
BIOL 305 ¹	Comp. Animal Physiology
BIOL 306	Molecular Biology
BIOL 307 ¹	Human Physiology
BIOL 313 ²	Bioinformatics Intro
BIOL 430 ³	Biological Chemistry
BIOL 442	Developmental Biology
BTEC 344	Epidemiology
BTEC 395 ²	Translational Bioinformatics
	Translational Biochemistry &
BTEC 430 ³	Molecular Biology

Current Column B Electives

BIOL 405	Adv Top Compar Physiology
BIOL 410	Modeling in the Life Sciences
BIOL 411	Bacterial Physiology
BIOL 412	Microbial Systems Biology

Proposed Column B Electives

BIOL 405	Adv Top Compar Physiology
BIOL 410	Modeling in the Life Sciences
BIOL 411	Bacterial Physiology
BIOL 412	Microbial Systems Biology

BIOL 414	Eukaryotic Molecular Genetics	BIOL 414	Eukaryotic Molecular Genetics
BIOL 415	Systems Biology	BIOL 415	Systems Biology
BIOL 420	Adv Topics:Cell Biology	BIOL 420	Adv Topics:Cell Biology
BIOL 421	Topics in Molecular Genetics	BIOL 421	Topics in Molecular Genetics
BIOL 425	Immunology	BIOL 425	Immunology
BIOL 426	Appr To Molecular Biol	BIOL 426	Appr To Molecular Biol
BIOL 428	Computer Appl Molec Biol	BIOL 428	Computer Appl Molec Biol
BIOL 429	Topics in Molecular Biology	BIOL 429	Topics in Molecular Biology
BIOL 434	Microbial Molec Genetics	BIOL 434	Microbial Molec Genetics
BIOL 444	Development And Cancer	BIOL 444 ⁴	Development And Cancer
BIOL 445	Signal Transduction	BIOL 445	Signal Transduction
BIOL 451	Neurobiology	BIOL 451	Neurobiology
BIOL 453	Physiol Bases Of Behavior	BIOL 453	Physiol Bases Of Behavior
BIOL 454	Vision Science	BIOL 454	Vision Science
BIOL 456	Plant Molecular Biology	BIOL 456	Plant Molecular Biology
BIOL 457	Phys:Marine/Est Animals	BIOL 457	Phys:Marine/Est Animals
BIOL 463	Theor & Quant Biology	BIOL 463	Theor & Quant Biology
BIOL 466	Population & Conservation Gen	BIOL 466	Population & Conservation Gen
BIOL 468	Ecology of Rivers and Streams	BIOL 468	Ecology of Rivers and Streams
BIOL 470	General Virology	BIOL 470	General Virology
BIOL 476	Antibiotics	BIOL 476	Antibiotics
BIOL 477	Appl of Biodetection Approach	BIOL 477	Appl of Biodetection Approach
BIOL 480	Animal Behavior	BIOL 480	Animal Behavior
BIOL 481	Advanced Topics in Evolution	BIOL 481	Advanced Topics in Evolution
BIOL 483	Evol: From Genes To Genomes	BIOL 483	Evol: From Genes To Genomes
BIOL 486	Genome Science	BIOL 486	Genome Science
BIOL 487	Medical Case Studies	BIOL 487	Medical Case Studies
BIOL 490	Chem.Comm. & Brain Disorders	BIOL 490	Chem.Comm. & Brain Disorders
BIOL 612	Microbial Systems Biology	BIOL 612	Microbial Systems Biology
BIOL 615	Systems Biology	BIOL 615	Systems Biology
BIOL 681	Advanced Topics in Evolution	BIOL 681	Advanced Topics in Evolution
CHEM 352 + CHEM 352L	Organic Chemistry II + Lab	CHEM 352 + CHEM 352L	Organic Chemistry II + Lab
CHEM 437	Comprehensive Biochem I	CHEM 437	Comprehensive Biochem I
CHEM 438	Comprehensive Biochem II	CHEM 438	Comprehensive Biochem II
GES 406	Aquatic Ecology	GES 406	Aquatic Ecology
GES 408	Quantitative Field Ecology	GES 408	Quantitative Field Ecology
GES 413	Seminar In Biogeography	GES 413	Seminar In Biogeography
STAT 414	Environmental Statistics	STAT 414	Environmental Statistics
STAT 419	Intro To Biostatistics	STAT 419	Intro To Biostatistics

STAT 420 Stat For Bioinformatics
 STAT 454 Applied Statistics

STAT 420 Stat For Bioinformatics
 STAT 454 Applied Statistics
BTEC 444⁴ Translational Cancer Biotechnology
BTEC 453 Biochemical Engineering

Current Upper Level Lab Elective Options

*(students choose two)**

BIOL 302L Mol & Gen Genetics Lab
 BIOL 303L Cell Biology Lab
 BIOL 304L Plant Biology Lab
 BIOL 305L Physiology Laboratory
 BIOL 306L Projects in Synthetic Biology
 BIOL 312L Modeling in the Life Sciences
 BIOL 316L Phage Genome Analysis
 BIOL 340L Developmtl Biology Lab
 BIOL 422L Microscopy & Imaging Techniques

*Students may substitute one BIOL Upper Level Lab Elective for two semesters of BIOL 499 – Independent Research, plus one semester of either BIOL 499L or BIOL 497H.

Proposed Upper Level Lab Elective Options

*(students choose two)**

BIOL 302L Mol & Gen Genetics Lab
 BIOL 303L Cell Biology Lab
 BIOL 304L Plant Biology Lab
 BIOL 305L Physiology Laboratory
 BIOL 306L Projects in Synthetic Biology
 BIOL 312L Modeling in the Life Sciences
 BIOL 316L Phage Genome Analysis
 BIOL 340L Developmtl Biology Lab
 BIOL 422L Microscopy & Imaging Techniques

MBIO 361L Sustainable Aquaculture Laboratory

*Students may substitute one BIOL Upper Level Lab Elective for two semesters of BIOL 499 – Independent Research, plus one semester of either BIOL 499L or BIOL 497H.

Current Statistics Requirement

(students choose one)

STAT 350 Stat W/App In Biol Sci
 STAT 355 Prob & Stat for Sci and Eng

Proposed Statistics Requirement

(students choose one)

STAT 350 Stat W/App In Biol Sci
 STAT 355 Prob & Stat for Sci and Eng
BTEC 350 Statistics for Translational Life Sciences

¹- Note 1: BIOL 305 and BIOL 307 are thematically similar, and therefore only one may be used as an elective for the major.

²- Note 2: BIOL 313 and BTEC 395 are thematically similar, and therefore only one may be used as an elective for the major.

³- Note 3: BIOL 430 and BTEC 430 are thematically similar, and therefore only one may be used as an elective for the major.

⁴- Note 4: BIOL 444 and BTEC 444 are thematically similar, and therefore only one may be used as an elective for the major.

Rationale (see instructions):

With the creation of the new TLST program, several of their new courses (BTEC acronym) align with the current Biological Sciences curriculum. In fact, many of these courses were modeled off the Biology Department's similarly numbered courses with the help of the Biology faculty who teach them in our department. Because of this, we would like to allow our students to utilize these new courses as they complete our major requirements. We are adding additional notes to the relevant sections to inform students that the related courses cannot be duplicated within the major, including BIOL 303 and BTEC 303, BIOL 430 and BTEC 430, BIOL 313 and BTEC 395, BIOL 444 and BTEC 444.

The Marine Biotechnology Department has only recently begun to offer courses. Their course work helps to fill a need for our students in the area interest of marine biology and ecology. This new MBIO course supplements nicely with our current lab offerings.

The Biology Department has received statements of support from both the Chair of the Marine Biotechnology Department, Dr. Yonathan Zohar, and the TLST Program Director, Dr. Annica Wayman. Please see additional documentation below for their messages. Attached to this file is also a current checklist of our program's requirements.

Bachelor of Science in Biological Sciences (BIOL BS) - Minimum Requirements

See Important Notes on the back of this form!

BIOL CORE COURSES	Pre-requisites	Cr.
BIOL 141 - Foundations of Biology: Cells, Energy & Organisms	MATH 150 or higher or placement in MATH151	4
BIOL 142 - Foundations of Biology: Ecology and Evolution	MATH 150 or higher or placement in MATH151, BIOL 141	4
BIOL 302 - Molecular and General Genetics (see note 3)	MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, CHEM 101/123, CHEM 102/124 (co-requisite)	4
BIOL 303 - Cell Biology	MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, BIOL 302, CHEM 102	4
BIOL 300L - Experimental Biology Laboratory	MATH 150 or higher or placement in MATH151, BIOL 141, BIOL 142, BIOL 302, CHEM 102, CHEM 102L	2
BIOL ELECTIVES		
_____ Column A elective (listed on back; see note 4)	See catalog	3-4
_____ Column B elective (listed on back; see notes 5, 13)	See catalog	3-4
_____ Column A or B elective (see notes 4, 5, 13)	See catalog	3-4
_____ Column B BIOL 4XX elective (see note 6)	See catalog	4
_____ Upper Level Laboratory elective (not BIOL300L)	See catalog	2-4
_____ Upper Level Laboratory elective (not BIOL300L)	See catalog	2-4
OTHER COURSES		
CHEM 101 - Principles of Chemistry I	MATH 106 or higher	4
CHEM 102 - Principles of Chemistry II	CHEM 101	4
CHEM 102L - Introductory Chemistry Lab I	CHEM 101, CHEM 102 (pre/co-requisite)	2
CHEM 351 - Organic Chemistry I	CHEM 102	3
CHEM 351L - Organic Chemistry Lab I	CHEM 102, CHEM 102L, CHEM 351 (pre/co-requisite)	2
PHYS 111 - Basic Physics I (see note 7)	None	4
PHYS 112 - Basic Physics II (see note 7)	PHYS 111	4
MATH 151 - Calculus & Analytical Geometry I	MATH 150	4
STAT 350 - Stats w/Applications in Biological Sciences or STAT 355 - Intro Prob and Stats for Scientists/Engineers	MATH 150 or higher MATH 152	4
_____ - MATH/STAT/CMSC elective (listed on back)	See catalog	3-4

Column A electives	Column B electives	Upper Level Laboratories	MATH/STAT/CMS C
BIOL 275 BIOL 304 BIOL 305 (note 4) BIOL 306 BIOL 307 (note 4) BIOL 313 BIOL 430 BIOL 442	Any BIOL 4XX course <u>except</u> BIOL 430, 442, 495, 497H, 499, 499H, 499L or any Lab course (see note 6)	Any BIOL 3XXL or 4XXL Lab course <u>except</u> BIOL 300L	MATH 152 MATH 221
	CHEM 352 and CHEM 352L (must take both - see note 5) CHEM 437 CHEM 438	Two semesters of BIOL 499 (total of 4 credits or more) and one semester of either BIOL 499L or BIOL 497H	STAT 414 STAT 420 STAT 454 (see note 8)
	STAT 414 STAT 419 STAT 420 STAT 454		CMSC 104 CMSC 201
	See note 13		

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 BIOL BS at least six of eleven BIOL classes must be taken at UMBC.
- 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) Students may not use both BIOL 305 AND BIOL 307 as Column A electives.
- 5) Students can substitute CHEM 352 and CHEM 352L (must take both) for one Column B course.
- 6) At least one BIOL 4XX lecture course must be taken at UMBC (NOTE: BIOL 430, 442, 495, 497 and 499 cannot be used to satisfy this requirement for the BIOL BS).
- 7) Students may substitute PHYS121 for PHYS111, and PHYS122 for PHYS112, but should note that PHYS121/122 may not satisfy some professional school admission requirements.
- 8) Students using a STAT class as a Column B course may not use the same course to fulfill the MATH/STAT elective requirement.
- 9) BIOL BS majors receive 33 - 43 Upper Level Credits (3XX/4XX) that may be applied to the University requirement of 45 Upper Level credits for graduation, and 69 - 77 credits toward the 120 total credits needed for graduation.
- 10) 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.
- 11) Students who are BIOC (Biochemistry and Molecular Biology) majors who wish to also pursue a BIOL BS degree may use Core BIOL, CHEM, MATH/STAT and PHYS courses from the BIOC major towards the BIOL BS degree, but MUST take separate electives for the two degrees (ie., no 'double-dipping' for the electives).
- 12) 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/>.
- 13) Biologically-relevant 4XX level courses from other departments may be acceptable as a 'Column B' elective for the BIOL BS degree. Prior approval from the Biological Sciences Department Undergraduate Committee is required, using the form indicated in note 12. Such courses may not be used for the BIOL 4XX requirement.



Nichole Zang Do <nzang1@umbc.edu>

MBIO 361L - Message of support from your department

Yonathan Zohar <zohar@umbc.edu>

Thu, Sep 19, 2019 at 7:52 AM

Reply-To: Yonathan Zohar <zohar@umbc.edu>

To: Farabaugh Philip <farabaug@umbc.edu>

Cc: David Eisenmann <eisenman@umbc.edu>, Elizabeth Feeser <efeaser@umbc.edu>, Colleen Burge <colleenb@umbc.edu>, Keiko Saito <saito@umbc.edu>, Nichole Zang Do <zang.do@umbc.edu>

Dear Phil,

As you know, yesterday I heard from Nichole Zang Do that your faculty agreed that DMB's MBIO 361L is a suitable course for the BIOL BA and BS degrees' lab requirement. We really appreciate your action on that course and the faculty interest in it.

On behalf of the Department of Marine Biotechnology, I would like to extend my support of the Department of Biological Sciences using MBIO 361L for their BIOL BA and BIOL BS degree's lab requirement. I look forward to start teaching this course. Please let me know what we need to do next. As you know, there are a couple of logistic issues related to this course that we must discuss/resolve.

Thank you and best regards.

[Quoted text hidden]

BTEC courses for BIOL majors

1 message

Annica Wayman <awayman@umbc.edu>

Wed, Sep 18, 2019 at 9:33 PM

To: Philip Farabaugh <farabaug@umbc.edu>

Cc: Nichole Zang Do <zang.do@umbc.edu>, David Eisenmann <eisenman@umbc.edu>, Elizabeth Feeser <efeeser@umbc.edu>

Dear Phil,

On behalf of the Translational Life Science Technology program in the College of Natural and Mathematical Sciences, I would like to extend my support of the Department of Biological Sciences using the following BTEC courses for their BIOL BA and BIOL BS degree's lab requirement:

- For the BIOL BA:
 - BTEC 303 can be used in the place of BIOL 303
 - Elective 1 options: BTEC 344, 395, 430, 444, and 453.
 - Statistics option: BTEC 350

- For the BIOL BS:
 - BTEC 303 can be used in the place of BIOL 303
 - Column A Elective options: BTEC 344, 395, and 430
 - Column B Elective options: BTEC 444 and 453
 - Statistics option: BTEC 350.

I look forward to our continued collaboration.

Regards,
Annica

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