Name: Campus ID:

Bachelor of Science in Bioinformatics and Computational Biology (BINF) - Requirements

87-90 credits

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Course	Name	Pre-requisites	Credits	Grade
Biology			25	
BIOL 141	Foundations of Biology I	MATH 150†	4	
BIOL 142	Foundations of Biology II	BIOL 141/H & MATH 150†	4	
BIOL 302	Molecular & General Genetics	MATH 150†, BIOL 141, BIOL 142 & CHEM 102/H/124[CR]	4	
BIOL 303	Cell Biology	MATH 150†, BIOL 302 & CHEM 102	4	
BIOL 300L	Experimental Biology Lab	MATH 150†, BIOL 141/H, BIOL 142, BIOL 302, CHEM 102/H & CHEM 102L	2	
BIOL 430*	Biological Chemistry	BIOL 303 and CHEM 351	4	
BIOL 313	Introduction to Bioinformatics	MATH 151/H and (BIOL 141 or CMSC 104**)	3	
Chemistry			13	
CHEM 101	Principles of Chemistry I	MATH 106 or higher	4	
CHEM 102	Principles of Chemistry II	CHEM 101/H	4	
CHEM 102L	Introductory Chemistry Lab I	CHEM101 or CHEM101H and CHEM102 [CR] or CHEM102H [CR]	2	
CHEM 351	Organic Chemistry I	CHEM 102/H	3	
Physics & Math			19	
PHYS 111 or PHYS 121	Introductory Physics I	MATH 150 / MATH 151 [CR]	4	
MATH 151	Calculus & Analytical Geometry	MATH 150 or placement	4	
MATH 152	Calculus II	MATH 151/H/141/155B	4	
MATH 221	Linear Algebra	MATH 151/141/380	3	
STAT 350 or STAT 355	Intro to Prob & Stats	MATH 150† / MATH 152	4	
Computer Science			17	
CMSC 201	Computer Science I for Majors	MATH 150†	4	
CMSC 202	Computer Science II for Majors	CMSC 201/H, MATH 150†	4	
CMSC 203	Discrete Structures	MATH 151/140	3	
CMSC 341	Data Structures	CMSC 202 & CMSC 203	3	
CMSC 461	Database Management Systems	CMSC 341/H	3	
Capstone and electives (see notes)			13-16	
BIOL 495 or BIOL 415 or BIOL 428***	Seminar in Bioinformatics Systems Biology Computer Applications in Molecular Biology	(See Catalog)	4	
List A Elective	(see List)	(see Catalog)		
List A/B Elective	(see List)	(see Catalog)		
List B Elective	(see List)	(see Catalog)		

☒ All courses used to meet the major requirements and their pre-requisites must be completed with a grade of C or better.
☒ All Honors College (H) variants for major requirements will satisfy the stated requirement.

† MATH 150 or higher or placement in MATH 151
[CR] Co-Requirement
* CHEM 437 can be used as a substitute for BIOL 430 when completing the CHEM 437/438 sequence, but cannot be used as an elective.
** CMSC 201 can be used to meet the CMSC 104 pre-requirement
*** The capstone bioinformatics courses (BIOL 495/BIOL 415/BIOL 428) are recommended to satisfy the elective List A requirement, but the same course cannot be used to satisfy both capstone and elective requirements.

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Electives

List A electives

Any BIOL 4xx / CHEM 4xx course approved by a BINF advisor, excluding: BIOL 430, BIOL 497H, 499, 499H, 499L; CHEM 499; or any Lab course.

List B electives

Any CMSC 4xx / IS 4xx / MATH 4xx / STAT 4xx course approved by a BINF advisor and the corresponding department/instructor, excluding CMSC 461, 493, 495, 498, 499; IS 400, 410, 469, 498; MATH 496, 497, 499; STAT 496, 497, 499; or any Lab course.

Notes on electives

- Several BIOL elective courses can be used to satisfy the WI requirement (BIOL 414, 421, 425, 451, 453, 454, 480, 483). Check catalog for WI offerings.
- One BTEC 4xx course from the Shady Grove campus – TLST-BI BS (Translational Life Science Technology – Bioinformatics Track) program may be considered as List A/B elective, following approval from a BINF advisor.

Itinerary

☒ A student planning to complete the B.S. in Bioinformatics & Computational Biology should begin a first course in chemistry during the first semester of the freshman year. The mathematics sequence should also be started as soon as possible.

☒ Students pursuing the Bioinformatics & Computational Biology B.S. should aim to take BIOL 313 in their sophomore year.

☒ Transfer students with an interest in Bioinformatics should contact the BINF undergraduate program director (UPD) as early as possible upon their arrival to UMBC in order to receive proper advising in degree planning.

Gateway requirements

Students must complete the courses below with a Grade Point Average (GPA) no lower than 3.0 and with no grade lower than "C" in any of the courses. At least three of these courses must be completed at UMBC. A course may be repeated once to meet gateway requirements, but both grades will be used to compute the gateway GPA. (e.g. a student receiving a grade of "B" in all six gateway courses with one enrollment in each course will have a gateway GPA of 3.0. A student receiving an initial grade of "C" and a repeated grade of "B" in CHEM 101, with a "B" in all other gateway courses, will have a gateway GPA of 2.86).

Required Gateway Course	Credits
BIOL 141 - Foundations of Biology I	4
BIOL 142 - Foundations of Biology II	4
CHEM 101 - Principles of Chemistry	4
CMSC 201 - Computer Science I for Majors	4
CMSC 202 - Computer Science II for Majors	4
MATH 151 - Calculus & Analytical Geometry I	4

Students transferring in more than 3 courses from the gateway should contact their advisor.

Under exceptional circumstances, the Department may waive or alter a BINF degree requirement. Students seeking to petition for a waiver must consult with their academic advisor, then may submit a Petition for Waiver/Substitution of Program Requirements.