MOLECULAR BIOLOGY AND BIOINFORMATICS MAJOR (BS)

Department website (https://www.uwp.edu/learn/programs/moleculardiomajor.cfm)

College: College of Natural & Health Sciences

The major in molecular biology and bioinformatics consists of a minimum of 43 credits in biological sciences, with additional courses in mathematics, chemistry, computer science and physics.

Program Learning Outcomes

1. Knowledge of the Natural World: Breadth of scientific knowledge, specifically, the ability to think beyond one's area of concentration.
2. Critical and Creative Thinking Skills: Experiential and problem solving skills as well as higher order qualitative and quantitative reasoning.
3. Effective Communication Skills: Competence in speaking, reading, and writing abilities.
4. Individual, Social and Environmental Responsibility: Civic knowledge and engagement (both local and global), ethical reasoning, and action; ability to interact and work with people under standard civility and professional norm.

Requirements for the Molecular Biology and Bioinformatics Major

Within the major, a minimum of 15 credits in courses numbered 300 or above must be completed at UW-Parkside. Students must maintain a minimum UW-Parkside cumulative GPA of 2.50 in all courses required for the major to graduate.

Code	Title	Credits
College of Natural and Health Sciences requirement		
New entering students, and transfer students with less than 30 college credits, choosing a major in the College of Natural and Health Sciences are required to take this course.		
UWP 101	First Year Seminar: Natural and Health Sciences	1
Required Core Courses [1]		
BIOS 101	Bioscience	4
BIOS 102	Organismal Biology	4
BIOS 210	Biostatistics	4
BIOS 260	General Genetics	4
BIOS 309	Molecular Biology	3
BIOS 453	Molecular Biology and Bioinformatics of Nucleic Acids	4
BIOS 455	Protein Biochemistry and Bioinformatics	4
BIOS 489 must be taken twice		2
BIOS 489	Molecular Biology and Bioinformatics Senior Project	
BIOS 499	Independent Study (over two semesters)	4
Students are also required to complete a minimum of 6 credits from the following list of courses:		6
BIOS 301	Cell Biology	
BIOS 303	Microbiology	
BIOS 307	Biochemical Metabolism	
Required Core Courses Subtotal		40
Mathematics, Chemistry, Computer Science and Physics Courses [2]		
Mathematics Course		
MATH 221	Calculus and Analytic Geometry I	5
Chemistry Courses		
CHEM 101	General Chemistry I	4
CHEM 102	General Chemistry II	4
CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry Lab II	1
CHEM 321	Organic Chemistry I	4
CHEM 322	Organic Chemistry II	4
Physics Courses		
Select one of the following:		10
PHYS 105 & PHYS 106	College Physics I and College Physics II	
PHYS 201 & PHYS 202	General Physics I and General Physics II	
Mathematics, Chemistry, Computer Science and Physics Courses Subtotal		33
Elective Courses		
Select two of the following:		6
BIOS 300-level through 600-level courses [3]		
CHEM 323	Organic Chemistry Lab [4]	
CHEM 620	Advanced Biochemistry	
CSCI 241	Computer Science I	
CSCI 242	Computer Science II	
MATH 222	Calculus and Analytic Geometry II [4]	
MATH 231	Discrete Mathematics (Same As CSCI 231)	
MATH 309	Probability and Statistics (Same As CSCI 309)	
MIS 322	Business Programming II	
MIS 328	Database Management Systems	
Total Credits		**79**

1 Students must complete core courses numbered in the 300s and below before they enroll in 400-level biological sciences courses. Exception from this prerequisite requires approval from the program faculty. Students should consult with their academic advisor before registration if such a situation arises.

2 Students who plan to do graduate work are advised to also take MATH 222 Calculus and Analytic Geometry II Calculus and Analytic Geometry II; and CHEM 302 Physical Chemistry I & CHEM 303 Physical Chemistry II Physical Chemistry I and II.

3 excluding: BIOS 435 Experimental Methods/Biochemistry Laboratory; BIOS 495 Senior Seminar; BIOS 499 Independent Study

4 Recommended but not required. Some graduate and professional schools require a second semester calculus and professional schools require a second semester calculus and/or an organic chemistry course with a laboratory component. It is recommended that students who are thinking about graduate or professional schools consult with their advisor to discuss options.

General University Degree Requirements (Bachelor's Degree)

In addition to individual program requirements, students must also fulfill the following requirements:

Requirement	Credits
Skills	7-8
General Education	36
Foreign Language**	6-8
Ethnic Diversity	3
Total	52-55

** Transfer students in sustainable management, and health information management and technology collaborative, online degree-completion programs, the business management online degree-completion program, and the flexible option degree-completion program will be exempt from the university's foreign language requirement. See appropriate academic section for further information.

Skills Requirement (https://catalog.uwp.edu/policies/#skills)

Code	Title	Credits
Reading and Writing		
ENGL 101	Composition and Reading	3
Computational Skills		
Select one of the following:		4-5
MATH 102	Quantitative Reasoning	
MATH 103	Elementary Statistics	
MATH 104	College Mathematics with Applications	
MATH 111	College Algebra I	
Total Credits		**7-8**

General Education (https://catalog.uwp.edu/policies/#general)

- General Education Course List (https://catalog.uwp.edu/programs/general-education-program/#coursestext)

Foreign Language (https://catalog.uwp.edu/policies/#language)

Ethnic Diversity (https://catalog.uwp.edu/policies/#ethnic)

Degree Requirements

Requirement	Credits
Minimum Total Credits	120
Upper Level Credits (300 level or above)	36
Residency	30

Cumulative Degree GPA: 2.0 minimum

Course	Title	Credits
Year 1		
Fall Semester		
UWP 101	First Year Seminar: Natural and Health Sciences	1
MATH 111	College Algebra I	5
ENGL 100	Fundamentals of English	3
BIOS 101	Bioscience	4
CHEM 101	General Chemistry I	4
CHEM 103	General Chemistry Lab I	1
	Credits	**18**
Spring Semester		
ENGL 101	Composition and Reading	3
BIOS 102	Organismal Biology	4
MATH 114	College Algebra II/Trigonometry	5
CHEM 102	General Chemistry II	4
CHEM 104	General Chemistry Lab II	1
	Credits	**17**
	Total Credits	**35**

Course	Title	Credits
Year 2		
Fall Semester		
BIOS 210	Biostatistics	4
CHEM 321	Organic Chemistry I	4
BIOS 260	General Genetics	4
General Education (HU)		3
	Credits	**15**
Spring Semester		
BIOS 309	Molecular Biology	3
CHEM 322	Organic Chemistry II	4
MATH 221	Calculus and Analytic Geometry I	5
General Education (SS)		3
	Credits	**15**
	Total Credits	**30**

Course	Title	Credits
Year 3		
Fall Semester		
BIOS 453	Molecular Biology and Bioinformatics of Nucleic Acids	4
PHYS 105	College Physics I	5
General Education (HU)		3
Introductory Language		4
	Credits	**16**
Spring Semester		
BIOS 455	Protein Biochemistry and Bioinformatics	4
PHYS 106	College Physics II	5
BIOS 301 or BIOS 303 or BIOS 307	Cell Biology or Microbiology or Biochemical Metabolism	3
Introductory Language		4
	Credits	**16**
	Total Credits	**32**

Course	Title	Credits
Year 4		
Fall Semester		
BIOS 489	Molecular Biology and Bioinformatics Senior Project	1
BIOS 499	Independent Study	2
General Education (HU)		3
General Education (SS)/ DV Course		3
General Education (HU)		3
300/400 Level General Elective*		3
	Credits	**15**
Spring Semester		
BIOS 489	Molecular Biology and Bioinformatics Senior Project	1
BIOS 499	Independent Study	2
General Education (SS)		3
BIOS 303 or BIOS 301 or BIOS 307	Microbiology or Cell Biology or Biochemical Metabolism	4
General Education (SS)		3

300/400 Level General Elective*	3
Credits	**16**
Total Credits	**31**

* See Catalog for list of approved courses