Bachelor of Science in Biochemistry Degree Requirements
Department of Chemistry & Biochemistry
College of Natural Sciences and Mathematics
The University of Toledo

I. Biochemistry Major Requirements

A. Required Courses in the Major

Course	Credit Hrs	Prerequisites/*Corequisites**	Semester(s) Offered
CHEM 1230 General Chemistry I	4	1090 or Placement Test	F,S,Su
CHEM 1280 General Chemistry Lab I	1	*1230*	F,S,Su
CHEM 1240 General Chemistry II	4	1230	F,S,Su
CHEM 1290 General Chemistry Lab II	1	1280, *1240*	F,S,Su
CHEM 2410 Organic Chemistry I	3	1240	F,S,Su
CHEM 2480 Organic Separations and Elementary Synthesis	2	1290, *2410*	F
CHEM 2420 Organic Chemistry II	3	2410	F,S,Su
CHEM 2490 Synthesis and Identification of Organic Compounds	2	2480, *2420*	S
CHEM 3310 Analytical Chemistry	2	1240	F
CHEM 3360 Analytical Chemistry Lab	2	1290, 3310	S
CHEM 3510 Biochemistry I	3	2420	F
CHEM 3520 Biochemistry II	3	3510	S
CHEM 3560 Biochemistry Lab	2	3510	S
CHEM 3610 Inorganic Chemistry I	3	2420	S
CHEM 4300 Instrumental Analysis	2	3310, 3360, *4570*	F
CHEM 4560 Biophysical Chemistry Lab	2	3520, *4570*	F
CHEM 4570 Biophysical Chemistry	4	3520, PHYS 2080 or 2140	F

B. Electives in the Major

At least one of the following advanced biochemistry electives:

CHEM 4500 Advanced Biological Chemistry	4	3520	F
CHEM 4510 Protein Chemistry	4	3510	S**
CHEM 4520 Enzymology	4	3510	S**
CHEM 4530 Nucleic Acid Chemistry	4	3510	S**

AND

At least one of the following advanced laboratory electives:

CHEM 4880 Advanced Laboratory III	2	3610, 3860	F
CHEM 3910 Undergraduate Research II	2 or more	*2420*	F,S,Su
CHEM 4910 Undergraduate Research III	2 or more	*4570*	F,S,Su

C. Required Courses in Related Fields

MATH 1750 or **1830** or **1850** Calculus I***	4	None	1750: F. S, Su 1830: F 1850: F, S, Su
MATH 1760 or **1840** or **1860** Calculus II***	4 (3 for 1760)	1760: MATH 1750 1840: MATH 1830 1860: MATH 1850	1760: F, S, Su 1840: S 1860: F, S, Su
PHYS 2070 or **2130** Physics I***	5	2070: None 2130: MATH 1830 or 1850	2070: F, Su 2130: F, S, Su
PHYS 2080 or **2140** Physics II***	5	2080: PHYS 2070 2140: PHYS 2130	2080: S, Su 2140: F, S, Su
BIOL 2170 Fundamentals of Life Sciences II	4	CHEM 1090 or BIOL 2150	F, S, Su
BIOL 3030 Cell Biology	3	CHEM 1240 and BIOL 2170	F, S, Su

*Prerequisites must be completed before taking a course; corequisites may be completed before or concurrently with a course. Beginning with the Fall 2017 Semester, students will only be able to enroll in MATH and 1000-level CHEM courses, if they have earned a grade of C or better in the prerequisite MATH or CHEM course . To enroll in 2000-4000 level CHEM courses, students must earn a C- or better in the prerequisite course. Students with a catalog year prior to Fall 2017 may request an override of this requirement from the instructor if they earned a grade of D- or above in the prerequisite course.

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** At least one of these courses is offered every spring semester. The same course is generally not offered in two consecutive years. Check the online course schedule for which course is offered in a given year. CHEM 4500 is offered every fall semester.
***MATH 1850/1860 and PHYS 2130/2140 are highly recommended.

II. College of Natural Sciences and Mathematics Core Curriculum (B.S.)

NSM 1000: Orientation (not required for transfer students)
English Composition I and II (Grade of C or better)
Calculus I and II (satisfied by Required Courses in Related Fields)
Two Writing Across The Curriculum courses (satisfied by CHEM 3360/4560)
Three Science/Math Courses (9 credit hours) from 3 different disciplines outside of major (satisfied by Required Courses in Related Fields).

III. University of Toledo Core Curriculum

*English Composition I and II
*Mathematics (3 hours)
Social Sciences (6 hours – 2 disciplines)
Arts and Humanities (6 hours -2 disciplines)
*Natural Sciences (6 hours)
*Electives (Math, Social Sciences, Humanities or Natural Sciences) (9 hours)
Multicultural Courses: US Diversity (3 hours), Non-Western (3 hours) (One or both multicultural course may count in a second area)

*Satisfied by Completion of Major or NSM Requirements in I and II

IV. General Information

A. 124 Credit Hours Required

At least 124 credit hours are required for your degree, and most students will need to take additional courses beyond the Major, College and University requirements to reach this number, as well as to maintain a full-time courseload. These may be advanced chemistry courses, other science courses, or non-science courses.

B. GPA/Level Requirements

2.5 GPA in CHEM coursework must be maintained (2.0 overall)
A total of 32 credits must be completed at the 3000-4000 level
A total of 64 credits must be completed at the 2000-4000 level

V. Departmental Honors Requirements

- Meet with an honors advisor to declare your intention to pursue departmental honors and at least once a year thereafter to go over your progress towards graduating with honors
- Maintain 3.3 cumulative overall GPA
- Maintain 3.5 cumulative GPA in chemistry courses
- At least six hours of honors CHEM courses at the 3000 level or above in at least two different areas (biochemistry analytical, inorganic, organic, physical chemistry)
- Complete at least one semester of CHEM 4910 (Undergraduate Research) and write and present an Honors Thesis based on your original research before graduation.

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VI. Sample Schedule of Courses for B.S. Biochemistry Majors

First Year		**Third Year**	
Fall Semester		Fall Semester	
CHEM 1230 General Chemistry I	4	CHEM 3510 Biochemistry I	3
CHEM 1280 General Chemistry Lab I	1	CHEM 3910 Undergraduate Research	2
MATH 1850 Calculus I	4	BIOL 2170 Fundamentals of Life Science	4
NSM 1000 Orientation	1	University Core Humanities	3
ENGL 1110 Composition I	3	*Electives/Minor*	*3*
University Core Humanities	3	**Total**	**15**
Total	**16**		
Spring Semester		Spring Semester	3
*CHEM 1910 Survey of Research**	1	CHEM 3520 Biochemistry II	2
CHEM 1240 General Chemistry II	4	CHEM 3560 Biochemistry Lab	3
CHEM 1290 General Chemistry Lab II	1	CHEM 3610 Inorganic Chemistry I	2
MATH 1860 Calculus II	4	CHEM 3910 Undergraduate Research	3
ENGL 1130 Composition II	3	BIOL 3030 Cell Biology	3
University Core Social Science	3	University Core Social Science	**16**
Total	**16**	**Total**	
Second Year		**Fourth Year**	
Fall Semester		Fall Semester	2
CHEM 2410 Organic Chemistry I**	3	CHEM 4300 Instrumental Analysis	4
CHEM 2480 Organic Lab for Majors I:		CHEM 4500 Advanced Biological Chemistry	2
Organic Separations and Elementary		CHEM 4560 Biophysical Chemistry Lab	4
Synthesis	2	CHEM 4570 Biophysical Chemistry	*3*
CHEM 3310 Analytical Chemistry	2	*Electives/Minor*	**16**
PHYS 2130 Physics I	5	**Total**	
University Core U.S. Diversity	4		
Total	**16**		
Spring Semester		Spring Semester	
CHEM 2420 Organic Chemistry II**	3	*Advanced Biochemistry Elective*	*4*
CHEM 2490 Organic Lab for Majors II:		*Advanced Biochemistry/Chemistry Elective*	*4*
Synthesis and Identification of Organic		CHEM 4910 Undergraduate Research	2
Compounds	2	*Electives/Minor*	*3*
CHEM 3360 Analytical Chemistry Lab	2	*Electives/Minor*	*3*
PHYS 2140 Physics II	5	**Total**	**16**
University Core Multicultural Diversity	3		
Total	**15**		

Notes:
Full-time students must be registered for 12-16 credit hours.
Courses in italics are not specifically required for the degree but may be required to reach 124 credit hours
*CHEM 1910 is not required but is a 1 credit hour Pass/No Credit course useful for learning about undergraduate research, which is a required component of Departmental Honors.
**CHEM 2410/2420 can be taken during the summer between Year 1 and Year 2, allowing the student to take CHEM 3510/3520 during Year 2 instead of Year 3, thus getting a head start on the advanced biochemistry portion of the degree.
8/18 JJB