

# BACHELOR OF SCIENCE IN BIOCHEMISTRY BACCMED TRACK

The Bachelor of Science degree in Biochemistry, BaccMed track, is specifically designed for students interested in seeking careers as physicians. The cross-disciplinary nature of the degree provides a student with a good foundation in the sciences, psychology, sociology, and public health. The student will not only be well prepared for the rigors of medical school, but he or she will also be aware of the issues facing health care professionals as well as be better able to deal with a diverse population.

For more information, please see the Chemical Sciences (<https://catalog.ysu.edu/undergraduate/colleges-programs/college-science-technology-engineering-mathematics/department-chemistry/#text>) overview page.

COURSE	TITLE	S.H.
<b>FIRST YEAR REQUIREMENT -STUDENT SUCCESS</b>		
HONR 1500	Intro to Honors	1
HONR 2601C	CE Honors Seminar	1-2
<b>General Education Requirements</b>		
ENGL 1550	Writing 1	3
ENGL 1551	Writing 2	3
Mathematics requirement included in the major.		
Some courses are categorized in more than one knowledge domain. Courses can only be used once within the General Education model.		
Arts & Humanities (Any 2 courses)		6
Natural Sciences (courses below are required for the major)		
CHEM 1515 & 1515L	General Chemistry 1 and General Chemistry 1 Laboratory	
PHYS 2610	General Physics 1	
or PHYS 1501 Fundamentals of Physics 1		
Social Science: (courses below are required for the major)		
PSYC 1560	General Psychology	3
PHLT 1531	Fundamentals of Public Health	3
General Education Electives (courses below are required for the major 9 s.h. total)		
CMST 1545	Communication Foundations	3
SOC 1500	Introduction to Sociology	3
Any Gen Ed Elective Course (3 s.h.)		3
<b>The following CHEM core courses are required (38 s.h.):</b>		
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
CHEM 1515R	Recitation for General Chemistry 1	1
CHEM 1516	General Chemistry 2	3
CHEM 1516L	General Chemistry 2 Laboratory	1
CHEM 1516R	Recitation for General Chemistry 2	1
CHEM 2604 & 2604L	Quantitative Analysis and Quantitative Analysis Laboratory	5
CHEM 3719	Organic Chemistry 1	3
CHEM 3719L	Organic Chemistry 1 Laboratory	1
CHEM 3719R	Organic Chemistry Recitation 1	1
CHEM 3720	Organic Chemistry 2	3
CHEM 3720L	Organic Chemistry 2 Laboratory	1
CHEM 3720R	Organic Chemistry Recitation 2	1
CHEM 3739	Physical Chemistry 1	3

CHEM 3739L	Physical Chemistry 1 Laboratory	1
CHEM 3785	Biochemistry 1	3
CHEM 3785L	Biochemistry Laboratory	1
CHEM 3786	Biochemistry 2	3
CHEM 5876	Enzyme Analysis	3

**The following capstone is required (3 s.h.):**

CHEM 4850	Chemistry Research	1
CHEM 4851	Chemistry Research Project	2

**The following BIOL core courses are required (18 s.h.):**

BIOL 2603	Integrated Biology for BaccMed	4
BIOL 3702	Microbiology	3
BIOL 3702L	Microbiology Laboratory	1
BIOL 3711	Cell Biology: Fine Structure	3
BIOL 3721	Genetics	3
BIOL 3705 & 3705L	Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory	4

**The following Mathematics and Statistics courses are required (12 s.h.):**

MATH 1581H	Honors Calculus for the Health Sciences 1	4
or MATH 1571	Calculus 1	
MATH 1572	Calculus 2	4
STAT 3743	Probability and Statistics	4
or STAT 3717	Statistical Methods	

**The following Physics Courses are required - choose Option 1 or Option 2 9-10 (9-10 s.h.):**

Option 1:

PHYS 2610	General Physics 1	
PHYS 2610L	General Physics Laboratory 1	
PHYS 2611	General Physics 2	
PHYS 2611L	General Physics laboratory 2	

Option 2:

PHYS 1501	Fundamentals of Physics 1	
PHYS 1501L	Fundamentals of Physics Laboratory 1	
PHYS 1502	Fundamentals of Physics 2	
PHYS 1502L	Fundamentals of Physics Laboratory 2	

**Select 7 s.h. in upper level CHEM electives (3000 or higher) from the list below. It is recommended that one elective course includes a laboratory.**

CHEM 3729	Inorganic Chemistry	
CHEM 3764	Chemical Toxicology	
CHEM 4851	Chemistry Research Project	
CHEM 4891	Special Topics	
CHEM 5804 & 5804L	Chemical Instrumentation and Chemical Instrumentation Laboratory	
CHEM 5821	Intermediate Organic Chemistry	
CHEM 5822 & 5822L	Advanced Organic Laboratory and Advanced Organic Laboratory	
CHEM 5832 & 5832L	Solid State Structural Methods and Solid State Structural Methods Laboratory	

**At least 3 s.h. in upper-level BIOL courses required from the list below.**

BIOL 3703	Clinical Immunology	
BIOL 3730	Human Physiology	
BIOL 4829	Microbial Physiology	
BIOL 4890	Molecular Genetics	
BIOL 4890L	Molecular Genetics Laboratory	
BIOL 5840	Advanced Microbiology	

**Other Required Courses:**

SOC 3745	Sociology of Health, Illness, and Healthcare	3
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HONR 4890C	Senior Honors Thesis: Capstone	1
<b>Total Semester Hours</b>		<b>124-126</b>

**Year 1**

<b>Fall</b>		<b>S.H.</b>
HONR 1500	Intro to Honors	1
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
CHEM 1515R	Recitation for General Chemistry 1	1
MATH 1571	Calculus 1	4
ENGL 1550	Writing 1	3
<b>Semester Hours</b>		<b>13</b>

**Spring**

HONR 2601C	CE Honors Seminar	1-2
CHEM 1516	General Chemistry 2	3
CHEM 1516L	General Chemistry 2 Laboratory	1
CHEM 1516R	Recitation for General Chemistry 2	1
MATH 1572	Calculus 2	4
ENGL 1551	Writing 2	3
BIOL 3711	Cell Biology: Fine Structure	3
<b>Semester Hours</b>		<b>16-17</b>

**Summer**

<b>Second Summer Session</b>		
BIOL 2603	Integrated Biology for BaccMed	4
PSYC 1560	General Psychology	3
<b>Semester Hours</b>		<b>7</b>

**Year 2**

<b>Fall</b>		
CHEM 3785	Biochemistry 1	3
CHEM 3785L	Biochemistry Laboratory	1
PHYS 2610 or PHYS 1501	General Physics 1 or Fundamentals of Physics 1	4
PHYS 2610L or PHYS 1501L	General Physics Laboratory 1 or Fundamentals of Physics Laboratory 1	1
BIOL 3721	Genetics	3
BIOL 3702	Microbiology	3
BIOL 3702L	Microbiology Laboratory	1
<b>Semester Hours</b>		<b>16</b>

**Spring**

CHEM 3786	Biochemistry 2	3
PHYS 2611 or PHYS 1502	General Physics 2 or Fundamentals of Physics 2	3-4
CHEM 5876	Enzyme Analysis	3
PHYS 2611L or PHYS 1502L	General Physics laboratory 2 or Fundamentals of Physics Laboratory 2	1
STAT 3743 or STAT 3717	Probability and Statistics or Statistical Methods	4
PHLT 3725	Topics in Public Health	3
<b>Semester Hours</b>		<b>17-18</b>

**Summer**

<b>First Summer Session</b>		
CHEM 3719	Organic Chemistry 1	3
CHEM 3719L	Organic Chemistry 1 Laboratory	1
CHEM 3719R	Organic Chemistry Recitation 1	1
PHLT 1531	Fundamentals of Public Health	3
<b>Second Summer Session</b>		
CHEM 3720	Organic Chemistry 2	3

CHEM 3720L	Organic Chemistry 2 Laboratory	1
CHEM 3720R	Organic Chemistry Recitation 2	1
SOC 3745	Sociology of Health, Illness, and Healthcare	3
<b>Semester Hours</b>		<b>16</b>

**Year 3**

<b>Fall</b>		
CHEM 3739	Physical Chemistry 1	3
CHEM 3739L	Physical Chemistry 1 Laboratory	1
CHEM 4850	Chemistry Research	1
CHEM Upper-level Elective		4
GER Arts & Humanities		3
<b>Semester Hours</b>		<b>12</b>

**Spring**

HONR 4890C	Senior Honors Thesis: Capstone	1
CHEM 4851	Chemistry Research Project	2
BIOL 3705 & 3705L	Introduction to Human Gross Anatomy and Introduction to Human Gross Anatomy Laboratory	4
SOC 1500	Introduction to Sociology	3
CHEM Upper-level Elective		3
BIOL Upper-level Elective		3
<b>Semester Hours</b>		<b>16</b>

**Summer**

<b>First Summer Session</b>		
CHEM 2604 & 2604L	Quantitative Analysis and Quantitative Analysis Laboratory	5
<b>Second Summer Session</b>		
CMST 1545	Communication Foundations	3
GER Arts & Humanities		3
<b>Semester Hours</b>		<b>11</b>
<b>Total Semester Hours</b>		<b>124-126</b>

## Learning Outcomes

The learning objectives for the major in Biochemistry, BaccMed Track are as follows:

- Undergraduate students will demonstrate an understanding of the fundamentals of chemistry and biochemistry.
- Undergraduate students will demonstrate independent and critical thinking.
- Undergraduate students will demonstrate an understanding of the fundamentals of modern chemical instrumentation.
- Undergraduate students will be able to interpret experimental data.
- Undergraduate students will effectively communicate their ideas both orally and in writing.