

**BACHELOR OF SCIENCE IN BIOCHEMISTRY BACCME T RACK**

The Bachelor of Science degree in Biochemistry, BaccMed track, is specifically designed for students interested in seeking degrees as primary care 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 (http://catalog.ysu.edu/undergraduate/colleges-programs/college-science-technology-engineering-mathematics/department-chemistry/#text) overview page.

**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.

**COURSE**

**TITLE**

**FIRST YEAR REQUIREMENT - STUDENT SUCCESS**

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<th>S.H.</th>
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**General Education Requirements**

- Arts & Humanities (2 courses)
- Natural Sciences - NS requirement included in the major.

**Required Electives:**

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 4850L Chemistry Research Laboratory
- CHEM 4891 Special Topics
- CHEM 5804 Chemical Instrumentation
- CHEM 5821 Intermediate Organic Chemistry
- CHEM 5822 Advanced Organic Laboratory
- CHEM 5832 Solid State Structural Methods
- CHEM 3703 Clinical Immunology
- CHEM 3730 Human Physiology
- BIOL 4829 Microbial Physiology

**The following CHEM core courses are required (38 s.h.):**

- CHEM 1515 General Chemistry 1
- CHEM 1515R Recitation for General Chemistry 1
- CHEM 1516 General Chemistry 2
- CHEM 1516R Recitation for General Chemistry 2
- CHEM 2604 Quantitative Analysis
- CHEM 3719 Organic Chemistry 1
- CHEM 3719R Organic Chemistry Recitation 1
- CHEM 3720 Organic Chemistry 2
- CHEM 3720R Organic Chemistry Recitation 2
- CHEM 3739 Physical Chemistry 1
- CHEM 3739R Physical Chemistry 1 Laboratory
- CHEM 3785 Biochemistry 1
- CHEM 3785L Biochemistry Laboratory
- CHEM 3786 Biochemistry 2
- CHEM 5876 Enzyme Analysis

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

- CHEM 5876 Enzyme Analysis

**The following BIOL core courses are required (14 s.h.):**

- BIOL 2603 Integrated Biology for BS/MD
- BIOL 3702 Microbiology
- BIOL 3711 Cell Biology: Fine Structure
- BIOL 3721 Genetics

**The following non-CHEM courses are required (22 s.h.):**

- MATH 1581H Honors Biomathematics 2
- MATH 1571 Calculus 1 (also required for the major)
- MATH 1572 Calculus 2
- STAT 3743 Probability and Statistics
- PHYS 2610 General Physics 1
- PHYS 2610L General Physics 1 Laboratory
- PHYS 2611 General Physics 2
- PHYS 2611L General Physics laboratory 2

**Required Electives:**

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 4850L Chemistry Research Laboratory
- CHEM 4891 Special Topics
- CHEM 5804 Chemical Instrumentation
- CHEM 5821 Intermediate Organic Chemistry
- CHEM 5822 Advanced Organic Laboratory
- CHEM 5832 Solid State Structural Methods
- CHEM 3703 Clinical Immunology
- CHEM 3730 Human Physiology
- BIOL 4829 Microbial Physiology

At least 4 s.h. in upper-level BIOL courses required from the list below; 4-5 s.h. recommended if needed to attain 120 s.h. required for graduation.

- BIOL 3703 Clinical Immunology
- BIOL 3730 Human Physiology
- BIOL 4829 Microbial Physiology
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Hours</th>
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<tbody>
<tr>
<td>BIOL 4836</td>
<td>Cell Biology: Molecular Mechanisms</td>
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<tr>
<td>&amp; 4836L</td>
<td>and Cell Biology: Molecular Mechanisms Laboratory</td>
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<td>BIOL 4837</td>
<td>Cell Biology: Protein Biology Laboratory</td>
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<td>BIOL 4890</td>
<td>Molecular Genetics</td>
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<tr>
<td>BIOL 4890L</td>
<td>Molecular Genetics Laboratory</td>
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<td>BIOL 5840</td>
<td>Advanced Microbiology</td>
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<td><strong>Other Required Courses:</strong></td>
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<tr>
<td>PHLT 3709</td>
<td>Elements of Urban Environmental Health Practices</td>
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<tr>
<td>PHLT 3725</td>
<td>Topics in Public Health</td>
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**Total Semester Hours**: 120-122

**Year 1**

**Summer**

- BIOL 2603 Integrated Biology for BS/MD 4
- PSYC 1560 General Psychology 3

**Second Summer Session**

- YSU 1500 Success Seminar 1
- CHEM 1515 General Chemistry 1 & 1515L General Chemistry 1 Laboratory 4
- CHEM 1515R Recitation for General Chemistry 1 or MATH 1571 or Calculus 1 1
- MATH 1571 Calculus 1 4
- ENGL 1550 Writing 1 3

**Fall**

- CHEM 3719 Organic Chemistry 1 & 3719L Organic Chemistry 1 Laboratory 4
- CHEM 3719R Organic Chemistry Recitation 1 1
- PHLT 1531 Fundamentals of Public Health 3

**Spring**

- CHEM 379 & 379L General Chemistry 2 and General Chemistry 2 Laboratory 4
- CHEM 379R Recitation for General Chemistry 2 1
- MATH 1572 Calculus 2 4
- ENGL 1551 Writing 2 3
- BIOL 3711 Cell Biology: Fine Structure 3

**Year 2**

**Summer**

- CHEM 3719 Organic Chemistry 1 & 3719L Organic Chemistry 1 Laboratory 4
- CHEM 3719R Organic Chemistry Recitation 1 1
- PHLT 1531 Fundamentals of Public Health 3

**First Summer Session**

- CHEM 3719 Organic Chemistry 1 & 3719L Organic Chemistry 1 Laboratory 4
- CHEM 3719R Organic Chemistry Recitation 1 1
- PHLT 1531 Fundamentals of Public Health 3

**Second Summer Session**

- CHEM 379 & 379L General Chemistry 2 and General Chemistry 2 Laboratory 4
- CHEM 379R Recitation for General Chemistry 2 1
- MATH 1572 Calculus 2 4
- ENGL 1551 Writing 2 3
- BIOL 3711 Cell Biology: Fine Structure 3

**Fall**

- CHEM 3785 Biochemistry 1 3
- CHEM 3785L Biochemistry Laboratory 1
- PHYS 2610 General Physics 1 4
- PHYS 2610L General Physics Laboratory 1 1
- BIOL 3721 Genetics 3
- BIOL 3702 Microbiology 4
- BIOL 3702L Microbiology Laboratory 0

**Spring**

- CHEM 3785 Biochemistry 2 3
- CHEM 5876 Enzyme Analysis 2
- PHYS 2611 General Physics 2 4
- PHYS 2611L General Physics Laboratory 2 1
- STAT 3743 Probability and Statistics or STAT 3717 or Statistical Methods 4

**Year 3**

**Summer**

- CHEM 2604 Quantitative Analysis & 2604L Quantitative Analysis Laboratory 5

**Second Summer Session**

- CMST 1545 Communication Foundations 3
- GER Arts & Humanities 3

**Fall**

- CHEM 379 & 379L General Chemistry 2 and General Chemistry 2 Laboratory 4
- CHEM 4850 Chemistry Research 1
- CHEM Upper-level Elective 4
- PHLT 3709 Elements of Urban Environmental Health Practices 3

**Spring**

- CHEM 4850L Chemistry Research Laboratory 2
- CHEM Upper-level Elective 3
- BIOL Upper-level Elective 3
- PHLT 3725 Topics in Public Health 3
- GER Arts & Humanities 3

**Total Semester Hours**: 118