**BIOLOGICAL CHEMISTRY (BIOC)**

**BIOC 101 Career Opportunities in Biochemistry**  
**Prerequisites:** Interest in becoming a biochemistry major.  
**Description:** Introduction to the field of biochemistry and faculty research interests in the Center for Biochemistry. Exploration of careers in biochemistry.  
**Credit Hours:** 1  
**Max credits per semester:** 1  
**Max credits per degree:** 1  
**Format:** LEC

**BIOC 205 Scientific Analysis and Technical Writing**  
**Prerequisites:** Biochemistry major or minor. LIFE 120 and CHEM 109 or CHEM 113  
**Notes:** BIOC 101 and CHEM 110 suggested to be taken prior to this course or concurrent enrollment.  
**Description:** Data analysis and presentation, hypothesis-driven research execution and various types of scientific writing with detailed examination of high impact biochemistry research literature.  
**Credit Hours:** 2  
**Max credits per semester:** 2  
**Max credits per degree:** 2  
**Format:** LEC

**BIOC 305 Reflective Approach to Graduate/Professional School Application**  
**Prerequisites:** Biochemistry major; junior standing or senior standing; BIOC 431. Biochemistry minor, with permission.  
**Notes:** Letter grade only.  
**Description:** Focuses on preparing students for graduate/professional school application through reflective writing and application specific activities.  
**Credit Hours:** 1  
**Max credits per semester:** 1  
**Max credits per degree:** 1  
**Format:** LEC  
**Offered:** SPRING

**BIOC 401 Elements of Biochemistry**  
**Crosslisted with:** BIOC 801  
**Prerequisites:** CHEM 255 (preferred) or CHEM 251; BIOS 101 and BIOS 101L or LIFE 120 and LIFE 120L  
**Notes:** Will not count towards a biochemistry major.  
**Description:** Structure and function of proteins, carbohydrates, lipids and nucleic acids; enzymes; principal metabolic pathways; and biochemical expression of genetic information.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**Prerequisite for:** NUTR 450; NUTR 455; VBMS 410

**BIOC 401L Laboratory for Elements of Biochemistry**  
**Prerequisites:** Parallel BIOC 321  
**Description:** Laboratory exercises and experiments that complement material covered in BIOC 401.  
**Credit Hours:** 1  
**Max credits per semester:** 1  
**Max credits per degree:** 1  
**Format:** LAB  
**Offered:** FALL/SPR

**BIOC 431 Structure and Metabolism**  
**Crosslisted with:** BIOC 831, BIOS 431, BIOS 831, CHEM 431, CHEM 831  
**Prerequisites:** LIFE 120 with a grade of C or better; CHEM 252 or CHEM 262 with a grade of C or better.  
**Notes:** BIOS 206 or AGRO 215 is recommended.  
**Description:** Structure and function of proteins, nucleic acids, carbohydrates and lipids; nature of enzymes; major metabolic pathways of catabolism; and biochemical energy production.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**Offered:** FALL/SPR  
**Prerequisite for:** AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOS 834, CHEM 834, AGRO 810, HORT 810; ASCI 820; ASCI 917; ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927; BIOC 305; BIOC 432, BIOC 832, BIOS 432, CHEM 432, CHEM 832, BIOS 832, BIOS 833, BIOS 834, CHEM 833, CHEM 834, BIOS 879; BIOS 950, VBMS 950; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; VBMS 410; VBMS 805

**BIOC 432 Metabolism and Biological Information**  
**Crosslisted with:** BIOC 431, BIOS 431, CHEM 431, AGRO 434, AGRO 831, BIOS 831, BIOS 832, CHEM 831, CHEM 832, CHEM 833, CHEM 834, CHEM 835, CHEM 836, CHEM 998; BIOS 850, BIOS 879; BIOS 950, VBMS 950; VBMS 919; VBMS 951  
**Prerequisites:** BIOC 431/831 with a grade of C or better; BIOS 206 or AGRO 215 with a grade of C or better.  
**Notes:** Continuation of BIOC 431/831.  
**Description:** Major metabolic pathways of anabolism, structural and biochemical aspects of biological information flow and use in biotechnology.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**Offered:** FALL/SPR  
**Prerequisite for:** ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 435; BIOS 932, BIOS 933, CHEM 932; BIOS 933, CHEM 933; CHEM 934, BIO 934, CHEM 934; BIOC 935, BIOS 935, CHEM 935; BIOC 992K, CHEM 992K; BIOC 998; BIOS 950, VBMS 950; VBMS 919; VBMS 951
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Crosslisted with</th>
<th>Prerequisites</th>
<th>Description</th>
<th>Credit Hours</th>
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<tr>
<td>BIOC 433</td>
<td>Biochemistry Laboratory</td>
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<td>Prerequisites: BIOC 431/831 or parallel; or CHEM 435/835</td>
<td>Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.</td>
<td>2</td>
<td>LEC</td>
<td>2</td>
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<td>FALL/SPR</td>
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<td>BIOC 437</td>
<td>Research Techniques in Biochemistry</td>
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<td>Prerequisites: BIOC 437, BIOS 837, BIOC 437, BIOS 837, BIOC 898; CHEM 498</td>
<td>Application of general biochemistry knowledge to current topics in the life sciences; literature research and seminar.</td>
<td>3</td>
<td>LAB</td>
<td>3</td>
<td>3</td>
<td>FALL</td>
<td>BIOC 437, BIOC 437, BIOS 437, BIOS 837, BIOC 837, BIOS 837, CHEM 837</td>
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<td>BIOC 439</td>
<td>Dynamics of Biochemical and Biological Networks</td>
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<td>Prerequisites: BIOC 839, BIOS 439, BIOS 839</td>
<td>To introduce and integrate, students in biochemistry and other life sciences, to the field of computational modeling of biochemical and biological network systems into a seamless curriculum.</td>
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<td>LEC</td>
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<td>BIOC 442</td>
<td>Computational Biology</td>
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<td>Prerequisites: Any introductory course in biology, or genetics, or statistics.</td>
<td>Databases, high-throughput biology, literature mining, gene expression, next-generation sequencing, proteomics, metabolomics, system biology and biological networks.</td>
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<td>LEC</td>
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<td>BIOC 444</td>
<td>Advanced Topics in Biophysical Chemistry</td>
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<td>Prerequisites: BIOC 486, BIOS 486, BIOS 886, CHEM 486, CHEM 886</td>
<td>Application of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.</td>
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<td>LEC</td>
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<td>BIOC 498</td>
<td>Undergraduate Research</td>
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<td>Prerequisites: Permission.</td>
<td>Research on a specific biochemical project under the supervision of a biochemistry faculty member.</td>
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<td>LAB</td>
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<td>BIOC 499H</td>
<td>Honors Thesis</td>
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<td>Prerequisites: Good standing in the University Honors Program or by invitation. AGRI 299H recommended.</td>
<td>Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.</td>
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<td>LAB</td>
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<td>SPRING</td>
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**ACE: ACE 10 Integrated Product**

**Notes:** Letter grade only.

**Prerequisite for:**

| VBMS 919 |