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, BIOC 834, BIOS 834, CHEM 834; AGRO 810, BIOC 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, CHEM 832, BIOS 833, CHEM 433, CHEM 833; 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 832, BIOS 432, CHEM 432, CHEM 832, BIOS 832  
**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; BIOC 932, BIOS 932, CHEM 932; BIOS 933, CHEM 933; BIOC 934, BIOS 934, CHEM 934; BIOS 935, BIOS 935, CHEM 935, BIOS 992K, CHEM 992K, BIOC 998; BIOS 950, VBMS 950; VBMS 919; VBMS 951
BIOC 433 Biochemistry Laboratory
Crosslisted with: BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833
Prerequisites: BIOC 431/831 or parallel; or CHEM 435/835.
Description: Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC
Offered: FALL/SPR
Prerequisite for: BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898, CHEM 498

BIOC 433H Honors: Inquiry-based Biochemistry Laboratory
Prerequisites: BIOS 206, Parallel BIOC 431
Description: A course-based research experience. Hypothesis-driven design of experiments. Data collection and analysis employing techniques used in spectroscopy, bioinformatics, mutagenesis, recombinant DNA, chromatography, enzyme analysis
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LAB
Offered: FALL

BIOC 434 Plant Biochemistry
Crosslisted with: AGRO 434, BIOS 434, CHEM 434, AGRO 834, BIOS 834, CHEM 834
Prerequisites: BIOC/BIOS/CHEM 431/831.
Description: Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

BIOC 435 Advanced Topics in Biochemistry
Prerequisites: BIOC/BIOS/CHEM 432/832 with a grade of C or better
Description: Application of general biochemistry knowledge to current topics in the life sciences; literature research and seminar.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

ACE: ACE 10 Integrated Product

BIOC 437 Research Techniques in Biochemistry
Crosslisted with: BIOC 837, BIOS 437, BIOS 837
Prerequisites: BIOC/BIOS/CHEM 433/833.
Description: Methods approach to systems biology analysis. Molecular identification and quantification employing techniques such as mass spectrometry, chromatography, electrophoretic fractionation, transcriptomics, proteomics and metabolomics. Data and pathway analysis with computational methods.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: VBMS 919

BIOC 439 Dynamics of Biochemical and Biological Networks
Crosslisted with: BIOC 839, BIOS 439, BIOS 839
Prerequisites: BIOC 206 or AGRO 215; BIOC 401 or BIOC 431
Notes: Letter grade only.
Description: 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.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: SPRING
Prerequisite for: ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 992K, CHEM 992K; BIOC 998

BIOC 442 Computational Biology
Crosslisted with: BIOC 842, STAT 842, STAT 442
Prerequisites: Any introductory course in biology, or genetics, or statistics.
Description: Databases, high-throughput biology, literature mining, gene expression, next-generation sequencing, proteomics, metabolomics, system biology and biological networks.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

BIOC 486 Advanced Topics in Biophysical Chemistry
Crosslisted with: BIOC 886, BIOS 486, BIOS 886, CHEM 486, CHEM 886
Prerequisites: CHEM 471/871 or CHEM 481/881.
Description: Applications of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

BIOC 498 Undergraduate Research
Prerequisites: Permission.
Description: Research on a specific biochemical project under the supervision of a biochemistry faculty member.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 6
Format: IND

BIOC 499H Honors Thesis
Prerequisites: Good standing in the University Honors Program or by invitation. AGRI 299H recommended.
Description: Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 6
Format: IND