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

BIOC 205 Scientific Analysis and Technical Writing
**Prerequisites:** Biochemistry major or minor. LIFE 120 and CHEM 109.
**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

BIOC 305 Reflective Approach to Graduate/Professional School Application
**Prerequisites:** Junior standing or senior standing; BIOC 431.
**Description:** Focuses on preparing students for graduate/professional school application through reflective writing and application specific activities.
**Credit Hours:** 1

BIOC 321 Elements of Biochemistry
**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

BIOC 321L Laboratory for Elements of Biochemistry
**Prerequisites:** Parallel BIOC 321
**Credit Hours:** 1

BIOC 324 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. First course of a two-semester, comprehensive biochemistry course sequence.
**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

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

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
BIOC 434 Plant Biochemistry
Crosslisted with: AGRO 434, BIOS 434, CHEM 434, AGRO 834, BIOC 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

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
ACE: ACE 10 Integrated Product
Prerequisite for: VBMS 919

BIOC 439 Dynamics of Biochemical and Biological Networks
Crosslisted with: BIOC 839, BIOS 439, BIOS 839
Prerequisites: BIOS 206 or AGRO 215; BIOC 321 or BIOC 431
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