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.
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 321 Elements of Biochemistry
Prerequisites: CHEM 255 (preferred) or CHEM 251; BIOS 101 and BIOS 101L or LIFE 120 and LIFE 120L
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: VBMS 410

BIOC 321L Laboratory for Elements of Biochemistry
Prerequisites: Parallel BIOC 321
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LAB

BIOC 431 Structure and Metabolism
Crosslisted with: BIOC 831, BIOS 431, BIOS 831, CHEM 431, CHEM 831
Prerequisites: CHEM 252 or CHEM 262 with a grade of C or better. LIFE 120 and BIOS 206 are recommended.
Notes: 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
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: VBMS 410

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.
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
Prerequisite for: BIOC 435; BIOS 934, BIOS 934, CHEM 934

BIOC 433 Biochemistry Laboratory
Crosslisted with: BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833
Prerequisites: BIOC 431/831 (or concurrent enrollment) 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

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, or permission
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
BIOC 439 Dynamics of Biochemical and Biological Networks  
Crosslisted with: BIOC 839, BIOS 439, BIOS 839  
Prerequisites: BIOS 206, BIOC 321 or BIOC 431 (or equivalent)  
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  

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 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