

Biochemistry Courses

Course Descriptions for CBC Undergraduate Courses

BIOC 101. *Career Opportunities in Biochemistry*. (1 cr lecture). Prereq: Interest in becoming a biochemistry major. Introduction to the field of biochemistry and faculty research interests in the Center for Biochemistry. Exploration of careers in biochemistry.

BIOC 321. *Elements of Biochemistry*. (3 cr lecture). Prereq: CHEM 251 and either BIOS 101 and 101L or 104H. BIOC 321 is not acceptable for biochemistry majors and may not be suitable for pre-medicine or graduate study preparation; consult your advisor. A one-semester, terminal course meeting the requirements for many majors in applied biological science areas. Topics include the structure and function of proteins, carbohydrates, lipids and nucleic acids; enzymes; principal metabolic pathways; and biochemical expression of genetic information.

BIOC 321L. *Laboratory for Elements of Biochemistry*. (1 cr). Prereq: Parallel BIOC 321.

BIOC 428/828. *Radioisotopic Methods* (BIOS 428/828). (2 cr lecture/1cr lab). Prereq: CHEM 106 or 110, PHYS/ASTR 142, and MATH 101 (106 recommended), or permission. With permission by the instructor, the lab may be waived and the course taken for 2 cr. Theoretical aspects and practical applications of radiotracer methodology in biochemical, biological, and agricultural research.

BIOC 431/831. *Biomolecules and Metabolism* (CHEM, BIOS 431/831). (4 cr lecture). Prereq: CHEM 252 or 262. Completion of Biochemistry 432/832 following this course is recommended. Suitable for biochemistry study in pre-professional and graduate programs. First course of a two-semester, comprehensive biochemistry course sequence. Structure and function of proteins, nucleic acids and carbohydrates; nature of enzymes; major metabolic pathways; and biochemical aspects of molecular biology.

BIOC 432/832. *Gene Expression and Replication* (CHEM, BIOS 432/832). (2 cr lecture). Prereq: BIOC/BIOS/CHEM 431/831. Completion of BIOC 431/831 and 432/832 provides comprehensive coverage of topics in modern biochemistry. Suitable for study in pre-professional and graduate programs. Continuation of BIOC 431/831. Structural and biochemical aspects of DNA replication, gene expression, and biotechnology.

BIOC 433/833. *Biochemistry Laboratory* (CHEM, BIOS 433/833). (2 cr lecture/lab). Prereq: BIOC/BIOS/CHEM 431/831 or concurrent enrollment. Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.

BIOC 434/834. *Plant Biochemistry* (AGRO, BIOS, CHEM 434/834). (3 cr, lecture). Prereq: BIOC/BIOS/CHEM 431/831 or the equivalent. Biochemical metabolism unique to plants. Relationships of topics previously described in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.

BIOC 435. *Advanced Topics in Biochemistry*. (3 cr lecture). Prereq: BIOC/BIOS/CHEM 432. Open to Biochemistry majors only. Application of general biochemistry to current topics in the life sciences; literature research and seminar.

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BIOC 437/837. *Research Techniques in Biochemistry* (BIOS 437/837). (4 cr lecture/lab). Prereq: CHEM 116 or 221 and BIOC 433/833, or permission. Practical applications of biochemical methodology to studies in the life sciences. Hands-on experience with quantitation by spectrophotometry and spectrofluorometry, chromatographic and electrophoretic fractionation of proteins and nucleic acids, detection of biomolecules by immunological and DNA hybridization techniques, and analysis of data with a microcomputer. For advanced undergraduate and beginning graduate students who plan a career in laboratory work within the life sciences.

BIOC 486/886. *Advanced Topics in Biophysical Chemistry* (CHEM, BIOS 486/886). (3 cr lecture). Prereq: CHEM 471/871 or 481/881. Applications of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.

BIOC 498. *Undergraduate Research* (BIOS 498). (1-6 cr). Prereq: Permission. Research on a specific biochemical project under the supervision of a Biochemistry faculty member.

BIOC 499H. *Honors Thesis*. (1-6 cr). Prereq: Admission to the University Honors Program and permission; AGRI 299H recommended. Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.

*BIOC 810. *Plant Molecular Biology* (AGRO, BIOS, HORT *810). (3 cr lecture). Prereq: AGRO315 or BIOS 301; BIOC 831 or permission.

BIOC 836. *Biophysical Chemistry* (CHEM/BIOS 836). (3 cr lecture). Prereq: One semester of physical chemistry or permission. Introductory course covering: X-ray diffraction and protein structure. Absorption spectroscopy of biomolecules, linear and circular dichroic spectroscopy of proteins and nucleic acids. Fluorescence probes, membrane dynamics, NMR, EPR, and resonance Raman spectroscopy applied to biological systems. Energetics, enzyme kinetics, relaxation kinetics, allosteric systems, and hydrodynamics.

*BIOC 838. *Molecular Biology Laboratory* (BIOS, VBMS *838). (5 cr lecture/lab). Prereq: BIOC 432/832, BIOS 312 and 313, an advanced course in genetics, and permission.

*BIOC 839. *Graduate Survey of Biochemistry* (CHEM, BIOS *839). (4 cr lecture). Prereq: Graduate standing in biochemistry, chemistry, or biological sciences or permission.

*BIOC 848. *Metals in Biochemistry* (CHEM *848). (3 cr lecture). Prereq: 3 hrs biochemistry and 3 hrs inorganic chemistry.

*BIOC 898. *Research in Biochemistry* (BIOS 898). (1-3 cr). Prereq: BIOC 433/833 and permission.

*BIOC 899. *Masters Thesis* (BIOS 899). (6-10 cr).

* Masters level courses.