
CHEM 321

Biochemistry

Fall 2022

TR 10:10-11:40am

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Course Description

This course provides a study of the relationship between structure and function in biomolecules including proteins and nucleic acids; methods of bioanalysis; prokaryotic DNA replication and the synthesis of proteins and RNA.

Required Materials

Foundations of Biochemistry, *Loertscher*, (ISBN: 978-1-60263-535-7)

A biochemistry textbook of your choosing (I will be using Biochemistry 9e by Berg, however Fundamentals of Biochemistry by Voet is also good)

Content and Structure

We will cover 20 chapters in all. Broad topics are listed below (not necessarily in order):

- The Chemistry of Life
- Nucleotides and Genetic Information
- Biosynthesis and Structure of Amino Acids
- Primary Structure of Proteins
- Three-Dimensional Structure of Proteins
- Protein Function
- Biosynthesis and Structure of Nucleic Acids
- Enzymatic Reaction Kinetics
- Biosynthesis and Structure of Lipids
- Metabolism of Carbohydrates
- Metabolism of Fatty Acids

Attendance

I expect you to attend every lecture and work session. I expect you to have knowledge of the information that is passed on in lecture and in the textbook, handouts, and quizzes. If you miss a class, it will be your responsibility to obtain the lecture notes from that day.

Grading

Pre Activity questions	10%
Post Activity questions	10%
Quizzes	10%
Project Presentation	10%
Exams	35%
Final Exam (cumulative)	25%

Letter grades will be assigned as:

A	93-100	C	69-75
A-	90-92	C-	66-68

B+	87-89	D+	64-65
B	81-86	D	59-63
B-	78-80	D-	54-58
C+	76-77	F	< 54

Coursework

We will be utilizing a Process Oriented Guided Inquiry Learning (POGIL) workbook in class. These are a set of activities design to help you engage with an understand the material in this course. Each activity consists of Pre Activity questions, Activity questions, and Post Activity questions. The Pre Activity questions will be due at the beginning of class before an activity is planned and the Post Activity questions will due at the beginning of class following that activity.

Exams

Regular exams will be take-home, open book and open note. You will have one week to complete exams. Exams will be given the week of the following dates:

Sept 26, Oct 17, Nov 7

Quizzes

Quizzes will be given at regular intervals to help you gauge your understanding of material. These will be 30 minute in-class assessments. They are closed-note and closed book.

Project Presentations

At the end of the course, each student will present a current events topic with biochemical relevance and give a 8-10 minute presentation explaining the underlying biochemical principles of the topic to the class. A rubric will be provided to help guide your presentation later in the semester.

Grading Policies

Extra time on take-home exams is not allowed unless there are dire, extenuating circumstances. If you are ill the day of an exam distribution, **please inform me as soon as possible so that I can get the exam to you.** If you know that you will have to miss an exam distribution due to an athletic competition or other event approved by the Dean's office, please let me know at least one week in advance so that an arrangement can be made for you to get your exam. Please note that the instructor reserves the right to request documentation to verify an excused absence.

Late Work and Extra Credit

Late work will be accepted up to one week after due date for a 10-point deduction and up to two weeks after the due date for a 20-point deduction. Work submitted after this will receive feedback, but no credit. Extra credit, **IF OFFERED**, will be announced to the entire class simultaneously. **Exams are excluded from this late policy!** Late exams will not be accepted.

Academic Integrity

All students are expected to adhere to the guidelines set forth in the SBC honor code, as outlined in the student handbook.

Accessibility

Sweet Briar College is committed to upholding and maintaining all aspects of the federal Americans with Disabilities Act of 1990 (ADA), as amended in 2008, and Section 504 of the Rehabilitation Act of 1973. If you are a student with a disability and wish to request reasonable accommodations, please contact the Office of Accessibility Services (accessibility@sbc.edu) for an appointment. Because many accommodations require early planning, requests for accommodations should be made as soon as possible.

Professor/Student-Athlete Academic Contracts

If you are on an athletic or riding team this term, I expect you to provide me with a completed Professor/Student-Athlete Academic Contract to consider and sign ASAP.

Diversity, Equity and Inclusion

At Sweet Briar, administrators, faculty, and staff are committed to the creation and maintenance of “inclusive learning” spaces. These are classrooms, labs, and other places of learning where you will be treated with respect and dignity, and where all individuals are provided equitable opportunity to participate, contribute, and succeed.

In this course, all students are welcome regardless of race/ethnicity, gender identities, gender expressions, sexual orientation, socio-economic status, age, disabilities, religion, regional background, veteran status, citizenship status, nationality and other diverse identities that we each bring to class.

Week of	Tuesday	Thursday
Sept. 12	Course Intro Organic Chemistry Review Ch. 1 Biochemistry : An Evolving Science	Ch. 1 Biochemistry : An Evolving Science Cont.
Sept. 19	Ch. 2: Protein Composition and Structure	Ch. 3 Exploring Proteins Quiz 1
Sept. 26	Ch. 7: Hemoglobin	Ch. 7: Hemoglobin Exam 1 Take Home
Oct. 3	Ch. 8: Enzyme Kinetics	Ch. 9 Catalytic Strategies Quiz 2 Exam 1 Due
Oct. 10	Ch. 11: Carbohydrates	Ch. 4: DNA, RNA, and Genetic Information
Oct. 17	Ch. 12: Lipids and Membranes; Ch. 13: Membrane Channels and Pumps Quiz 3	Ch. 13: Membrane Channels and Pumps; Ch. 14 Signal Transduction Exam 2 Take Home
Oct. 24	Ch. 15: Metabolism (Basic Concepts and Design) Quiz 4	Ch. 16: Glycolysis and Gluconeogenesis Exam 2 Due
Oct. 31	Ch. 17: The Citric Acid Cycle	Ch. 18: Oxidative Phosphorylation
Nov. 7	Ch. 22: Fatty Acid Metabolism Quiz 5	Ch. 23: Protein Turnover (Urea Cycle); Ch. 24; Biosynthesis of Amino Acids Exam 3 Take Home
Nov. 14	Ch. 24: Biosynthesis of Amino Acids; Ch. 25: Nucleotide Biosynthesis	Ch. 26: Biosynthesis of Membrane Lipids and Steroids Exam 3 Due
Nov. 21	Thanksgiving Break	Thanksgiving Break
Nov. 28	Ch.18: Regulation	Ch. 27: Integration of Metabolism
Dec. 5	Presentations	Presentations
Dec. 12	Friday Classes	