UNIVERSITY of VIRGINIA

UVA IN VALENCIA PROGRAM

CHEM 4440 BIOCHEMISTRY FOR PRE-HEALTH FALL 2026

I. COURSE DESCRIPTION

Biochemistry course will take you on a journey that describes and explains life on the molecular level. Through organic and biological chemistry, you will build fundamental understanding of how biological molecules are assembled, why and how they react and interact in living organisms. The journey will take you from small to very large molecules such as DNA, RNA, proteins, and long-chain sugars, and you will explore the properties and role of these macromolecules in maintaining homeostasis on the cellular level. You will discover how disruption of the chemical balance gives a raise to genetic mutations, metabolic disorders, and diseases. Finally, you will find out how we use chemical and biochemical principles to develop tools and techniques to sequence and manipulate DNA, investigate forensically crime scenes, analyze gene expression, and regulate enzyme activity etc.

II. GRADING SCALE AND BREAKDOWN

Grades will be awarded according to the **Uva Engineering grading scale**:

A 10-9 **A-** 8,9-8	**B+** 7,9-7 **B** 6,9-6 **B-** 5,9-5,5	**C** 5,4-5	**F** 4,9-0

Category	Weight
Class Participation	5%
Quizzes	5%
Homework	10%
Discussion Sessions	15%
Midterm 1	15%
Midterm 2	15%
Midterm 3	15%
Final Exam	20%

Class Participation (5%)

Students are expected to comply with the assigned work plan on a daily basis. Coming prepared to class is essential to the learning process. The following rubric is important regarding participation grades:

A The student always prepares the class and complies with the work plan assigned daily; he/she participates voluntarily and frequently, works well as a team, and contributes positively to the classroom environment.

B The student participates voluntarily and frequently by answering questions from the teacher

C The student participates sporadically when the teacher asks and he/she/they occasionally asks questions.

D The student does not make effort to participate or minimum work is done.

F The student is absent and shows disrespect to other peers and to the professor.

Quizzes (5%)

Students will have the opportunity to evaluate their learning progress with the Quizzes. Quizzes will be available on WileyPlus platform all day on Friday between 8am - 11.59pm.

Homework (10%)

Doing homework diligently and regularly is essential for success in the course. In addition, the homework will often play a key role for in-class discussions and success on the quizzes and midterms.

Homework problems are assigned on WileyPlus platform in electronic form. You can take as much time as you need on each question, just remember that your homework has to be submitted by deadline posted on WileyPlus platform.

Discussion sesions (15%)

Discussion Sessions meetings give you an opportunity to practice, review material and ask questions. You will be working in teams with your classmates on a given set of problems. Instructions for discussion session are posted on WileyPlus platform.

Midterm exam (15%)

This exam covers the material studied in the previous chapters. Only topics covered during course will be asked. The format of the exam is TBD. It will be composed by one or several of each of the following types of exercises: multiple choice questions , definitions, concept questions, numerical calculations, problems. More information will be given during the last week of class before the Midterm Exam. Midterms will be administered during the Discussion Session time. No midterms will be delivered outside of this time frame, unless it is necessary to do so for SDAC accommodations.

Final exam (20%)

This exam will cover the entire course. Only topics covered during course will be asked. The format of the exam is TBD. It will be composed by one or several of each of the following types of exercises: multiple choice questions, definitions, concept questions, numerical calculations, problems. More information will be given during the last week of class before the Final Exam.

III. BIBLIOGRAPHY AND MATERIALS

WileyPlus platform will give you access to eBook, Quizzes, Homework, practice problems, extra credit problems and other assignments.

This course will take part in Inclusive Access program with The UVA Bookstore. This service enables The UVA Bookstore to offer students instant access to the course materials your professor requires at the lowest price!
It means you immediately have access to your digital course materials through UVA Canvas for the first 2 weeks of class—for free. Login to your UVA Canvas course and follow the instructions within the course to access the digital materials. Log in at www.wileyplus.com/go/login. Select Add Course. Enter your Course Section ID and select Find my course. Review your course section details, then click Next. Your Course Section ID WileyPLUS: C85218

IV. COURSE PLANNING AND CALENDAR

s	Session	Topic	Reading
Mon 07-Sep-26	Theory	Introduction – Chemical Basis of Life	Ch 1
	Discussion	DS 1	
Wed 09-Sep-26	Theory	Aqueous Chemistry	Ch 2
Mon 14-Sep-26	Theory	Protein Structure I	Ch 4
	Discussion	DS 2	
Wed 16-Sep-26	Theory	Protein Structure II	Ch 4

Mon 21-Sep-26	Theory	Carbohydrates	Ch 11
	Midterm	**MIDTERM 1 (Ch 1,2,4)**	
Wed 23-Sep-26	Theory	Lipids and Membranes I	Ch 8
Mon 28-Sep-26	Theory	Lipids and Membranes II	Ch 8
	Discussion	DS 3	
Wed 30-Sep-26	Theory	Membrane Transport	Ch 9
Mon 05-Oct-26	Theory	Nucleic Acid Structure I	Ch 3/20
	Discussion	DS 4	
Wed 07-Oct-26	Theory	Nucleic Acid Structure II	Ch 3/20
Mon 19-Oct-26	Theory	Protein Function I	Ch 5
	Discussion	DS 5	
Wed 21-Oct-26	Theory	Protein Function II	Ch 5
Mon 26-Oct-26	Theory	How Enzymes Work I	Ch 6
	Midterm	**MIDTERM 2 (Ch 11,3,5,8,9,20)**	
Wed 28-Oct-26	Theory	How Enzymes Work II	Ch 6
Mon 02-Nov-26	Theory	Enzyme Kinetics and Inhibition I	Ch 7
	Discussion	DS 6	
Wed 04-Nov-26	Theory	Enzyme Kinetics and Inhibition II	Ch 7
Mon 09-Nov-26	Theory	Metabolism and Bioenergetics	Ch 12
	Discussion	DS 7	
Wed 11-Nov-26	Theory	Glucose Metabolism I	Ch 13
Mon 16-Nov-26	Theory	Glucose Metabolism II	Ch 13
	Discussion	DS 8	
Wed 18-Nov-26	Theory	Citric Acid Cycle I	Ch 14
Fri 20-Nov-26	Theory	Citric Acid Cycle II	Ch 14
Mon 23-Nov-26	Theory	Oxidative Phosphorylation I	Ch 15
	Midterm	**MIDTERM 3 (Ch 6,7,12,13,14)**	
Wed 25-Nov-26	Theory	Oxidative Phosphorylation II	Ch 15
Wed 02-Dec-26	Theory	Lipid Metabolism	Ch 17
Wed 09-Dec-26	Theory	Review for Final Exam	—
Mon 14/ Wed 16-Dec-26	**Final**	**FINAL EXAM (both class blocks, 180 min, cumulative)**	

IMPORTANT INFORMATION

1) Use of Spanish at the Center

The use of Spanish at the Center is strongly encouraged. Remember that you have come to Spain to learn Spanish and immerse yourself in its culture, and there is no better way to do so than by using Spanish on as many occasions as possible.

2) Class Attendance and Tardiness

2.1) Attendance and punctuality are essential for the successful completion of the course. Consequently, unexcused absences and lateness will negatively affect the final grade.

2.2) Only one unexcused absence is permitted. Please bear this in mind when planning trips or outings.

2.3) Arriving more than 5 minutes late to class will count as half an absence (1/2). It is the student's responsibility to notify the instructor of an absence before the class begins.

2.4) Arriving more than 30 minutes late to class will be considered an absence.

2.5) Four (4) unexcused absences will result in the student not receiving credit for the course.

2.6) Only documented absences will be considered excused: a religious holiday, a family emergency, or a medical appointment. Medical absences must be supported by a doctor's note and submitted at reception on the day the student returns to class after the incident has ended.

3) Academic Integrity

3.1) The exchange of information is not only permitted but is also a way of enriching the knowledge acquired during the course. However, all work submitted for each course must be individual and original in every respect. Any sources and direct quotations used must be properly cited.

3.2) Remember that the use of artificial intelligence to complete assignments or examinations is strictly prohibited unless an instructor expressly states otherwise. Such use constitutes a lack of authenticity, and may amount to direct plagiarism, in addition to undermining the development of critical thinking and writing skills, which are among the primary goals of this program. Failure to comply with this rule will result in a grade of "F" for the course.

3.3) Any work that has received credit for one course will NOT be accepted for credit in another course. There will be NO exceptions to this rule. Reusing such work will result in immediate failure of the second course. If assignments for two different courses are related in any way and the student has questions about whether the second project is permissible, the matter must be discussed with all instructors involved. This will prevent any possible unintentional violation of this rule.

3.4) As with punctuality, assignments must be submitted on time. Any late submission will result in a reduction of the grade for that assignment.

3.5) Failure to comply with the provisions set out above will result in the loss of the corresponding course credits for the course in which these rules have been violated.

3.6) If you have a documented special need that requires academic accommodations (SDAC), it must be certified by your home institution. Please contact the Head of Studies in Valencia, María Andrés (maria.andres@uvavalencia.org).

4) Activities, Workshops, and Lectures

Throughout the course, various activities, workshops, and lectures are organized. Participation may be voluntary or mandatory if the instructor considers the activity relevant to the course.

5) Classroom Conduct

5.1) It is very important that all students arrive to class on time, prepared, and with the materials needed for the day. During class, students must treat one another and the instructor with respect, demonstrate a positive attitude, and help create a participatory and collaborative environment that supports effective learning. Any violation of these expectations will have direct consequences.

5.2) Electronic devices (laptop, mobile phone, smartwatch) may be used in class only for course-related purposes. If a student uses such technology for personal reasons during class, the student may be penalized with an unexcused absence.

5.3) The use of computer or electronic technology during examinations is prohibited unless the instructor determines otherwise in accordance with the examination format.

6) Course Content

On occasion, and always within the context of the course, certain "sensitive" topics may be addressed both inside and outside the classroom. Therefore, if a student feels offended by such content in a particular class, the student may leave the class, and doing so will not have any negative effect whatsoever on the final grade. Faculty members will always be open to communication and dialogue in order to promote better intercultural understanding.

7) Final Clarification

The instructor may modify or add activities and/or change the dates indicated according to the learning needs of the group. Effective learning requires not only careful planning, but also a certain degree of flexibility.