



CMB 702 Cell and Molecular Biology

Course Description: Cellular Biochemistry is an online, asynchronous course with an emphasis on the structure, metabolism, and biochemical function of major macromolecules (proteins, carbohydrates, lipids, and nucleic acids). Bioenergetics, enzyme kinetics, cell signaling, and regulation are studied at the molecular level. Emphasis is placed on cellular and physiological applications of biochemistry.

Credit Hours: 6

Course Prerequisites: CMB 705; CMB 706 or permission of instructor

Course Dates: Fall, 2024-25

Course Times: online

Course Location: online

Instructor: Hennington/Syed

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Required text and other learning resources: The required text is **Molecular Biology of the Cell**, Alberts, et al., Garland Science, 6th Edition or 7th edition. Instructors may assign additional readings and selected primary research journal articles will be used.

Course Overview: This is an advanced multidisciplinary course in Cellular and Molecular Biology. The course provides a thorough overview of the cell structure, basic genetic mechanisms, cellular biology techniques, internal organization of the cell, and cells in their social context.

Course Objectives: Upon completion of the course, students will be able to:

- Apply the scientific method to generate, test, critique, refine (or abandon) hypotheses
- Summarize and explain the key tenants of cellular and molecular biology
- Describe the design and significance of cellular components and their interactions
- Describe basic genetic mechanisms

- Explain the importance of epigenetic factors to the cellular environment
- Describe the importance of the cellular environment for determining responses to changing cellular conditions
- Employ primary literature research to determine methods used to analyze novel and complex cellular systems
- Apply data analysis with multiple important practical applications that have arisen from the field of molecular biology
- Explain the role of the cell cycle in the development of cancer and outline treatments for different types of cancer
- Describe how cellular components communicate

Grading Policy and Rubric:

Quizzes and Exams	25%
Problem Sets	25%
Projects	25%
Journal Club	5%
Discussion Boards	10%
Attendance	5%

CMB 702 Topics

	Ch	Instructor
Proteins & Enzyme Kinetics	3	Hennington
DNA, Chromosomes & Genomes	4	Hennington
DNA Replication, Repair & Recombination	5	Hennington
From DNA to Protein	6	Hennington
Control of Gene Expression	7	Hennington
Exam 1		
Analyzing Cells, Molecules and Systems	8	
Molecular Structure & Transport & Electrical Properties	10 & 11	Hennington
Intracellular Compartments & Protein Sorting	12	Hennington
Intracellular Vesicular Traffic	13	Hennington
Exam 2		
The Cytoskeleton	16	Syed
Cell Communication	15	Syed
Membrane Transport of Small Molecules	11	Syed
Cell Junctions and the Extracellular Matrix	19	Syed
Exam 3		
The Cell Cycle and Cell Death (ROS & Cellular Death)	17 & 18	
Cancer	20	Syed
Molecular and Cellular Evolution	20	Syed
Development of Multicellular Organisms	21	Syed
Exam 4		

Course Policies:

Attendance is based on assignment due dates, quiz dates and exam dates. The student must turn in assignments on the designated date and time and quizzes and exams are to be taken on designated days. Students must follow the calendar a minimum of 90% for assignments/quizzes/exams. **You will be assessed 1% of the assignment grade for each day the assignment is late.** Late assignments, missed quizzes or tests will be considered absences.

You will be using Lockdown Browser and Respondus Monitor for each of the exams. *There are no make-up exams unless otherwise granted by the Program Director PRIOR to an examination date. Failure to take an EXAM (mid-term and/or final) without prior permission from the Program Director will be recorded as 0.*

Course communication

- i. Electronic mail (email) services are provided to the UMMC community in support of the missions and administrative functions of the university. Users of the email system are expected to comply with the Email Policy, Information Policy, and all other UMMC policies.
- ii. The email system may not be used for illegal or unlawful activities. Email users are expected to use the services in a professional and respectful manner.
- iii. Students will receive information from instructors via email and their UMMC email account. **Therefore, students are expected to check their UMMC email accounts daily.** Students are responsible for contacting the UMMC Helpdesk (601-984-1145) if there are problems with email log in.

Submission of assignments

All assignments will be submitted through CANVAS learning management platform at UMMC.

Grading of assignments

All assignment grades and feedback will be posted in Canvas. Instructor will have up to 48 hours after the due date to provide grades/feedback on daily/weekly HW assignments. For writing assignments and projects, Instructor will have up to 5 business days after the due date to provide feedback on assignment. Students may work ahead and turn in assignments prior to the due date, however, the Instructor will be grading according to the due date schedule.

ACADEMIC INTEGRITY

1. **HONOR CODE:** Because integrity is the foundation of scientific endeavors, a student in the Certificate Program pledges to be honest and trustworthy in all proceedings. The student will not cheat on examinations, plagiarize the work of others, or falsify assignments.
2. **Dishonesty** is defined as "an (intentional) act of deception" in one or more of the following areas:
 - **Cheating:** Use or attempted use of unauthorized materials, information, or study aids.
 - **Fabrication:** Falsification or invention of any information.

- **Assisting:** Helping another commit an act of dishonesty.
- **Tampering:** Altering or interfering with evaluation instruments and documents.
- **Plagiarism:** Representing the words or ideas of another person as one's own.
- **Other examples** include but are not limited to:
 - i. Use of textbooks, notes or any unauthorized materials during an exam.
 - ii. Looking at other student's tests during an exam.
 - iii. Collaborating on assignments when collaboration is not allowed.
 - iv. Having someone take an exam for you or taking the exam for someone else.
 - v. Obtaining exams or questions from exams through illicit means.
 - vi. Use of unauthorized websites during computerized exams.
 - vii. Assisting someone in one of these behaviors.
- Evidence of dishonesty may result in a grade of "F" on the examination/assignment that involved cheating and/or an "F" in the course.
- Important Notice about Plagiarism:
Plagiarism is not tolerated and will be punishable by expulsion from the certificate program. If plagiarism is detected after the certificate has been awarded, the certificate may be rescinded.
- **Avoiding Plagiarism:** There are numerous resources available to assist students in avoiding plagiarism. The leading tool for plagiarism detection is Turnitin.com. Students may be required to submit assignments and/or formal papers to Turnitin.com to evaluate for originality and intellectual integrity (i.e. plagiarism). Turnitin.com checks papers and assignments against a collection of national databases and generates a report that highlights any blocks of text in the submitted document that match reference sources with links back to the matching documents. Students may submit a draft of their paper and use the Originality Report to determine if revisions are needed to prevent plagiarism before submitting the final paper for grading.
- In some instances, students may be required to submit the final version of papers or assignments to Turnitin.com first, then to the instructor for grading. **PLEASE DO NOT SUBMIT YOUR REFERENCE PAGE OR TITLE PAGE. MAXIMUM % ACCEPTED WILL BE no greater than 20% AS DETERMINED BY TURNITIN.COM (excluding question stems/prompts and instructor written instructions/guidelines).** Written work will be submitted to turnitin.com as assigned by instructors. Written work will be submitted to turnitin.com as assigned by instructors.
- Turnitin.com also checks for Artificial Intelligence additions. **Please be aware that we only accept 0% AI.**
- For a good discussion about plagiarism and how to properly cite your sources, <http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9>

Learning Platform:

The School of Graduate Studies in the Health Sciences uses CANVAS Learning Management System (LMS) software to deliver course content. Once you are enrolled in a course by the faculty you can go to <http://umc.instructure.com> to login and retrieve course material. You will receive an email notifying you of enrollment in a course using CANVAS. **A headset with a microphone or webcam with integrated microphone is required.**

University Policies:

Students with disabilities (ADA) statement

Refer to UMMC policy

Academic honesty statement

Refer to UMMC policy

Sample Syllabus