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BIOB 260.00: Cellular and Molecular Biology

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Cellular and Molecular Biology

BIOB 260

Autumn 2021

Urey 101, MWF, 9:00 AM-9:50 AM

Discussion sessions: 50 minutes per week at various times

Instructors:

Jim Driver

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Mark Grimes

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Office hours MWF, 10:00 AM to 10:50 AM or by appointment (arrange by email).

Text: Alberts *et al.*, Essential Cell Biology, 5th ed. (ISBN: 9780393680362)

Online homework: Smartwork5 via Moodle (<https://www.umt.edu/umonline/>)

Clicker: iClicker REEF polling app (www.iclicker.com/students/apps-and-remotes/apps)

Graduate Teaching Assistants:

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Learning outcomes: to understand life at the cellular and subcellular levels; to think critically and solve scientific problems; and to appreciate the role molecular processes play in modern biology. This course will emphasize biological principles, scientific concepts, and information syntheses while fostering an appreciation of cellular structure and function as well as the role of genes and genetic processes at the molecular level. Students will be able to:

- Given the thermodynamic and kinetic characteristics of a biochemical reaction, predict whether it will proceed spontaneously and the rate at which it will proceed.
- Recognize structures of the four major classes of building-block molecules that make up cellular macromolecules and membranes.
- Compare how the properties of water affect lipid membranes and the three-dimensional structures of macromolecules, and functional interactions between them.
- From their structures, predict which solutes will be able to diffuse spontaneously through a pure phospholipid bilayer membrane and which will require transport by membrane-associated proteins.
- Outline the flow of matter and energy in the processes by which organisms fuel growth and cellular activities, and explain how these processes conform to the laws of thermodynamics.
- Using diagrams, demonstrate how the information in a gene is stored, replicated, and transmitted to daughter cells.
- Describe how the information in a gene directs expression of a specific protein.
- Describe how cells are organized and the role of membranes, organelles and cytoskeletal elements in energy and information transformations.
- Compare the ways cells convert extracellular signals into intracellular signals that transduce information to govern cell division, cell death, and cell differentiation.

Required course prerequisites: C– or better in BIOB 160 and CHMY 123 or 143.

How to succeed in this class:

The best way to succeed in this class is to come to class prepared. That means read the book chapter and do the online homework assignments *before each lecture topic is discussed in class*. Think of questions to ask before class, and ask them in class. Class time will be spent discussing difficult topics, not every detail of every topic.

Grading:

There are a total of 570 points to earn:

Four midterm exams, 100 points each (300 points total after dropping the lowest exam)

One final exam, cumulative, 100 points

Online homework (pre-class and post-class quizzes), 100 points total

Lecture participation points, 50 points total (scaled from total clicker question points)

Discussion section participation points, 20 points total

The top 10 to 20 percentile of class will be awarded a grade of A or A-. The median score of the class will approximately set the cutoff between grades of B- and C+. A total score of 50% or less will be a failing grade (F). Pluses (+) and minuses (-) will be used (A, A-, B+, B, B-, C+, C, C-, D+, D, and D-). A CR grade is equivalent to a D- or better and a NCR grade is equivalent to an F. There are no opportunities for extra credit.

There are **no make-ups** for missed clicker questions. Make-ups for missed exams are strongly discouraged, but requests **made in advance** with a compelling and verifiable excuse will be considered on a case-by-case basis.

You must submit your request to have an **exam re-graded** in writing to the professors within two weeks of the return of the graded exam and your exam will be completely re-graded.

Exams and quizzes: will cover material from lecture, discussion sections, and assigned reading. The first three midterm exams are during class (9:00 AM) on dates identified in the Schedule. The fourth midterm exam and the final exam are given together at 8:00 AM on December 11. All exams will be closed book and no electronic devices are allowed.

The iClicker REEF polling app will be used for participation points (1 clicker point for responding to 75% of questions in each class and 1 clicker point for each answer, which will be scaled to 50 lecture participation points); you will need to have the app on an internet-connected device and participate.

PDF files of lectures, supplementary material, and videos will be available to download or view from [Moodle](#). Links to lecture recordings, when available, will be posted.

An official UM email address must be used for **email correspondence** with the instructor, according to University policy. Grades cannot be discussed by email, according to FERPA.

Accommodations to ensure accessibility of **students with disabilities** will be gladly made, but to qualify you must be registered with Disability Services for Students (DSS). Arrangements for accommodations on exams must be through DSS and students must take the exam at the same time as scheduled for the class.

Academic misconduct will be reported and handled as described in the University of Montana Student Conduct Code. *All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.*

Dropping course or changing grading status will strictly follow the University policies and procedures, which are described in the catalog. Requests to drop the course or change the grading status to benefit a student's grade point average will not be approved.

Accessibility Syllabus Statement:

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. We will work with you and the ODE to implement an effective accommodation.

COVID-19 is not over

We know that the COVID-19 pandemic has severely disrupted your lives and has presented formidable challenges to your education. The Cell and Molecular Biology professors, graduate teaching assistants and learning assistants endeavor to provide an engaging and safe learning experience in these adverse times. Please keep in touch with problems that arise.

The lecture and discussion sections will be face-to-face. At this time, face coverings are required for individuals in classroom and laboratory settings (see [UM's face covering policy](#)). If you are unable to wear a mask, please contact your academic adviser or the Office for Disability Equity (if appropriate) to discuss alternative options immediately. Students who fail to wear masks will be dismissed from the class and may face a disciplinary hearing through the Office of Community Standards.

The Delta variant of SARS-CoV-2 is of serious concern because it is more transmissible and causes more severe symptoms. As of August, 2021, Missoula City-County Health Department recommends all individuals -- regardless of vaccine status -- wear a mask indoors to slow the spread of COVID-19 in our community (see the [coronavirus information website](#)).

Please remain vigilant outside the classroom and help mitigate the spread of COVID-19. Stay home and contact the Curry Health Center at (406) 243-4330 if you feel sick and/or if you are exhibiting COVID-19 symptoms. If you are diagnosed with COVID-19, follow instructions for quarantine and contact your advisor so they can help you stay on track academically. Above all, if you are not yet vaccinated, please get vaccinated as soon as possible. In summary:

- Mask use is required within the classroom or laboratory.
- If you feel sick and/or are exhibiting COVID-19 symptoms, please don't come to class and contact the Curry Health Center at (406) 243-4330.
- If you are required to isolate or quarantine, you will receive support in the class to ensure continued academic progress. (Add specific information about how you, as the instructor, will continue providing course materials to students in quarantine or isolation.)
- (If instructors are comfortable sharing or including this) UM recommends students get the COVID-19 vaccine. Please direct your questions or concerns about vaccines to Curry Health Center.
- Where social distancing (maintaining consistent 6 feet between individuals) is not possible, specific seating arrangements will be used to support contact tracing efforts.
- Class attendance and seating will be recorded to support contact tracing efforts.
- Drinking liquids and eating food is discouraged within the classroom.