Biology 168: Honors Cellular and Molecular Biology
3 credits lecture and discussion
The University of Tennessee, Spring 2016

Lecture: Tuesdays and Thursdays 10:00 am-10:50 am, James A Haslam II Business Bldg., room 102
Lecture Instructors: Dr. Maitreyi Das (mdas@utk.edu)
Office Hours (F235 Walters Life Sciences): Tuesdays 1:30 pm-3:30 pm;
Other meetings by appointment only;

Discussion: 50 minutes hours per week in 114 Neyland Biology Annex; 25% of your course grade.
Discussions start the week of January 17 (see your schedule for discussion time)

Discussion Coordinator: Dr. Crystal McAlvin, 128 Neyland Biology Annex, cbickley@utk.edu
(You MUST talk to Dr. McAlvin with any question regarding discussion sections)

Discussion Instructor: TBA

Lecture TA: TBA

Lecture exams: Exams will be proctored outside of regular lecture periods. Exams 1, 2, and 3 will be held from 6.30pm to 8:00 pm on Mondays, February 8, March 7 and April 4.

What you should learn in this course (and for a Biology degree)
By the end of the course, you should be able to explain how scientists define and study cells, as well as how five big ideas (FBIs) in biology relate to the topics we have discussed:
- **Evolution**: Populations of organisms and cells, including their molecular components, have changed over time through both selective and non-selective evolutionary processes.
- **Structure and Function**: All living systems (cells, organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
- **Information Flow and Storage**: Information (DNA, for example) and signals are used and exchanged within and among cells and organisms to direct their functioning.
- **Transformations of Energy and Matter**: All living things acquire, use, and release and cycle matter and energy for cellular / organismal functioning.
- **Systems**: Living systems are interconnected, and they interact and influence each other on multiple levels.

You should also be proficient in the following five scientific practices (FSPs):
- Formulate empirically-testable hypotheses; ask scientific / critical questions
- Synthesize information and identify patterns (from readings or data)
- Interpret visual representations (figures and diagrams)
- Evaluate data and come to a conclusion (with evidence) (formulate an argument)
- Communicate information in writing

Course Description: Intended for science majors. An introduction to the major biological concepts emphasizing the cellular and molecular aspects of life. Organized along themes of evolution, structure and function, information flow, exchange and storage, pathways of energy and matter, and systems. **Satisfies General Education Requirement: (NS)**
**How you will learn the material**
Learning results from being actively engaged with the material, repeatedly and in many forms. You are expected to come to class being prepared by having read the sections assigned for the lecture and by having completed any pre-class assignment. Being prepared for lecture is essential to succeed in the course, this includes having taken blackboard quizzes or mastering biology assignments as they arise. The lectures will be constructed assuming you will be responsible enough to prepare as indicated. You will be expected to participate in class discussions and activities and to complete assignments and homework on time. These activities are implemented to help you learn and master the concepts. MasteringBiology includes study modules that can also help you learn. The information will be presented in an organized fashion to facilitate learning and will thrive to focus on the most challenging concepts. In addition, the instructors will provide you with many activities and assignments to facilitate your engagement with the material as well as to test your understanding, **but you will have to devote time outside of lecture to synthesize and link the concepts together.** Quizzes and tests, given in class or on Blackboard, will test your understanding of the concepts, NOT just your ability to memorize information.

<table>
<thead>
<tr>
<th>Lecture Schedule</th>
<th>Reading assignments</th>
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<tbody>
<tr>
<td><strong>This schedule is tentative and subject to change!</strong></td>
<td>(Readings must be completed PRIOR to lecture; other readings may be assigned)</td>
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<tr>
<td><strong>Jan 22 - Last day to drop without a “W”; Apr 5 - Last Day to Drop with a &quot;W&quot;(WP/WF); Apr 29 - Last Day for a University Withdrawal</strong></td>
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<tr>
<td>January 14</td>
<td>Class Introduction, Cell theory</td>
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<td>January 19</td>
<td>Chemical elements, chemical bonds, water, functional groups</td>
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<tr>
<td>January 21</td>
<td>Biological Macromolecules /Proteins</td>
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<td>January 26</td>
<td>Biological Macromolecules / Nucleic acids</td>
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<td>January 28</td>
<td>Biological Macromolecules / Carbohydrates</td>
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<tr>
<td>February 2</td>
<td>Biological Macromolecules/Lipids</td>
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<td>February 4</td>
<td>Membranes and transport across membranes</td>
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<tr>
<td><strong>Monday February 8: EXAM 1 6.30-8.00 pm</strong></td>
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<tr>
<td>February 9</td>
<td>Inside the Cell</td>
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<td>February 11</td>
<td>Inside the Cell</td>
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<tr>
<td>February 16</td>
<td>Introduction to energy Enzymes and Metabolism</td>
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<td>February 18</td>
<td>Introduction to energy Enzymes and Metabolism</td>
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<tr>
<td>February 23</td>
<td>Harvesting Chemical Energy: respiration</td>
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<td>February 25</td>
<td>Harvesting chemical energy: respiration and fermentation</td>
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<td>March 1</td>
<td>Photosynthesis</td>
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<td>March 3</td>
<td>Photosynthesis</td>
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<td><strong>Monday March 7: EXAM 2 6.30-8.00 pm</strong></td>
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<tr>
<td>March 8</td>
<td>Cell cycle and cell division: organization of the chromosome</td>
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<td>March 10</td>
<td>Cell cycle and mitosis</td>
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<td>March 15</td>
<td>SPRING BREAK- no class</td>
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<td>March 17</td>
<td>SPRING BREAK- no class</td>
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<td>March 22</td>
<td>Meiosis: recombination and diversity</td>
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<td>March 24</td>
<td>DNA replication: synthesis and repair</td>
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<td>March 29</td>
<td>DNA replication: synthesis and repair</td>
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<td>March 31</td>
<td>How genes work</td>
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Monday APRIL 4: Exam 3 6:30-8:00 pm

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<tr>
<th>April 5</th>
<th>DNA to proteins: transcription</th>
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<tr>
<td>April 7</td>
<td>DNA to proteins: RNA processing</td>
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<tr>
<td>April 12</td>
<td>DNA to proteins: translation</td>
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<tr>
<td>April 14</td>
<td>DNA to proteins: translation</td>
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<tr>
<td>April 19</td>
<td>Control of gene expression (Bacteria)</td>
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<tr>
<td>April 21</td>
<td>Control of gene expression (Bacteria)</td>
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<td>April 26</td>
<td>Control of gene expression (Eukaryotes)</td>
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<td>April 28</td>
<td>Control of gene expression (Eukaryotes)</td>
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Chapter 17

Final Exam Thursday May 5 8:00 – 10:00 a.m. As per the registrar’s website: “Final exams must be given during the final exam period at the scheduled time, although alternative uses of the scheduled exam period may be designated by the instructor. Students are not required to take more than two written exams on any day. The instructor(s) of the last non-departmental exam(s) on that day must reschedule the student’s exam during the exam period. It is the obligation of students with such conflicts to make appropriate arrangements with the instructor at least two weeks prior to the end of classes.”

Cumulative

Technology: While in class, keep all electronic devices out of sight unless needed. The use of laptops and smartphones in class will be discussed the first week of class. During exams and quizzes, any electronic device seen on your desk or within sight will result in a grade of zero.

Support for learning
Texts and Materials:

- REQUIRED Mastering Biology software: free with purchase of a new textbook at bookstore; you can also purchase the software directly from Pearson as either Mastering with or without the e-Book. Course ID MBDAS15053 (use this to register for the course in Mastering Biology)
- REQUIRED – Learning Catalytics software: free with purchase of a new textbook at bookstore; you can also purchase the software directly from Pearson with Mastering with the e-Book.
- REQUIRED - TurningPoint response “clicker”. Available at the UT Bookstore.

Course website: http://online.utk.edu/ (Click “Login to Online@UT” to get to Blackboard). You will have two Blackboard sites for the course, one for your discussion section and one for lecture. The lecture site will be used regularly for communication and posting lecture syllabus, extra readings, assignments, course grades, etc.

Communications:

- You need to regularly check your UTK e-mail account for weekly announcements related to this course. If you are not receiving those e-mails, there is something wrong with your account! If this is the case, OIT will be able to help you.
- If you need to meet and can’t make office hours, please use your UTK e-mail (spam filters may exclude other addresses) to schedule a meeting.
- We are happy to answer your e-mail questions, but allow up to 24 hours (or next working day) for a response. Also, once we leave our offices we may not check our e-mail until the following workday, or the first day back after a weekend.
Study Rooms:
417 Hesler is a quiet study room for majors in Biology. It can also be reserved for group study. There is also a student study room in Neyland Biology Annex, room 103.

Assessment of your learning
Assessment (quizzes, exams, assignments) is very important to the learning process. It lets you and us know what you understand and what you do not. We quiz often because it encourages you to keep up with your studying and helps you learn – every time you have to re-process information you learn more! It also gives us an important feedback mechanism to know what parts of the syllabus are more challenging.

Although much of the assessment in this course will be multiple choices, we will also use short answers and may use written assignments to deepen your understanding.

Lecture: (75% of grade; 750 points)
- Exams 1, 2 and 3 (12% or 100 pts each; multiple choices and short answers) 300 points
- Final exam = Exam 4 (with cumulative part representing 25% of total) 150 points

Quizzes and Assignments (approximate break-down below)
- Learning Catalytics/blackboard quizzes/Clickers and in-class group activities 10% or 100 points
- Take home assignments 5% or 50 points
- Mastering biology assignments 15% or 150 points

Discussion: (25% of grade; 250 points) – See discussion syllabus

Exams / Quiz / Assignment Policies:

• NO make-up quizzes, in-class activities, learning catalytics points, in-class or mastering biology assignments will be given; there will be “extra” quiz points built into the course to allow for missing classes, etc.
• The quizzes may or not be announced and will be delivered in-class or prior to class on blackboard. The quizzes may pertain to assigned chapter and/or section readings prior to the day lecture or from a past lecture.
• The quizzes and assignments (masteringbiology, learning catalytics and blackboard quizzes) MUST be taken and are NOT optional.
• The 2 lowest masteringbiology assignments and the 4 lowest Clicker quiz scores will be dropped. Dropping the lowest score is intended to cover any problem such as having computer or internet access issues, missing class etc.
• NO make-up exams will be given without a valid excuse (e.g., family emergency, medical emergency, etc). The excuse MUST be documented.
• VERY IMPORTANT: If you are going to miss an exam, you MUST contact us prior to the start of the exam. Send us an e-mail, and if you don’t receive an acknowledgment of your email, send it again
• Make-up exams may be short answers, fill-in-the-blanks, or essay and will be scheduled at the instructor’s convenience and by their permission only.
• Assignments turned in after the due date will lose 25% of the points per 24 hours after the deadline.
• All work should be done independently (unless group work is permitted, and then you may ONLY work within your group on the assignment); plagiarism software will be used to check written assignments for copying from classmates or other sources. Plagiarism will result in stiff penalties – please see section below.
• Exams will be prepared from all information sources: lecture, textbook, assigned reading outside of the textbook or handouts.
• Exam, quiz, assignments and activity scores will be posted on our class Blackboard site (online@UT)
• Be aware that no individual credit will be available for this class outside of what each instructor may offer for the entire class, i.e., no extra credit may be offered to a single student or a group of students if it is not also offered to the entire class.

Final letter grades will be determined by the total percentage of 1,000 points accumulated as follows:

- **A** 93 – 100%
- **A-** 90 – 92%
- **B+** 87 – 89%
- **B** 83 – 86%
- **B-** 80 – 82%
- **C+** 77 – 79%
- **C** 73 – 76%
- **C-** 70 – 72%
- **D+** 67 – 69%
- **D** 63 – 66%
- **D-** 60 – 62%
- **F** <60%

**Academic integrity:**
Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of phrases, portions of sentences or the main ideas from ANYONE (including a classmate) on ANY work submitted for a grade (exams, assignments, quizzes, etc). Academic dishonesty also includes assisting other students on quizzes or exams.

You are expected to abide by The University of Tennessee honor statement in Biology 130 and in all of your university activities as pledged in the honor code:

> “An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

(2012-2013 Undergraduate Catalog)

Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor, and can occur in either the lecture or the lab portion of the class.

You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (http://catalog.utk.edu/).

**Other course information**
**Tennessee Education Lottery Scholarship Recipients:** All courses for which you are enrolled count toward your attempted hour total. You must receive approval from the Office of Financial Aid & Scholarships when withdrawing from UT or changing your enrollment status from full-time to part time in order to maintain good standing for the TELS program. Approvals are only issued for extraordinary circumstances, such as the death of an immediate family member, documented serious illness, or military mobilization. See Financial Aid website at: http://web.utk.edu/~finaid

**Disability Services:** If you need course adaptations or accommodations because of a documented disability, please contact me privately to discuss your needs. If you have questions or concerns about disabilities or
emergency information to share, please contact Disability Services: 2227 Dunford Hall; 974-6807; Email: ods@utk.edu; Website: http://ods.utk.edu/).

Counseling Center: http://counselingcenter.utk.edu/
900 Volunteer Boulevard
865 974-2196, Email: counselingcenter@utk.edu

Academic Assistance:
Tutoring: The Division of Biology does not offer tutoring services. Contact the Student Success Center and the Academic Support Unit of The Office of Minority Student Affairs for information about tutoring opportunities.
  • Student Success Center: The comprehensive source for information, services, and resources to assist your success at UT: http://studentsuccess.tennessee.edu/studentsuccesscenter/
     o 1817 Melrose Avenue, and 812 Volunteer Boulevard, 865 974-6641, Email: studentsuccess@utk.edu
  • Academic Support Unit of The Office of Minority Student Affairs offers some tutoring services available to all students, but openings are limited and are filled quickly. The office offers other types academic assistance and support as well: http://omsa.utk.edu/services/
     o 1800 Melrose Avenue, 865 974-6861, Email: omsa@utk.edu

Technical Assistance:
Blackboard, or general information technology assistance:
  • http://remedy.utk.edu/contact/
  • Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
  • OIT Computer Support Service Center and Walk-In Help Desk: Commons South, 2nd floor Hodges Library
  • Turning Technologies (clickers): 866 746 3015