## **BS161-001-SS14 Introduction to Biology: Cells and Molecules**

## **Class Meetings**

M, W, F 10:20-11:10, 1281 Anthony Hall

## **Teaching Team**

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| **Course Manager and Instructor**  Dr. April D. Cognato  E-mail: [ac@d2l.msu.edu](mailto:ac@d2l.msu.edu)  Office: 21 Natural Sciences  Office Hours: M, W 3:30-4:30 | **Instructor**  Dr. Thomas D. Sharkey  E-mail: [tsharkey@msu.edu](mailto:tsharkey@msu.edu)  Office: 201 Biochemistry  Office Hours: W 3:00-5:00 and by appointment |

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| **Instructor**  Dr. Hideki Takahashi  E-mail: [htakaha@msu.edu](mailto:htakaha@msu.edu)  Office: 209 Biochemistry  Office Hours: T 9:00-10:00, Th 1:00-2:00 | **Graduate Teaching Assistant**  Aparajita Banerjee  E-mail: [banerj12@msu.edu](mailto:banerj12@msu.edu)  Office: 219 North Kedzie  Office Hours: T 5:30-6:30, F 12:30-1:30 |

## **About Your Instructors**

**Dr. April Cognato** has been an assistant professor in the Department of Zoology at Michigan State University since 2006. Her research expertise is in the area of organismal biology, molecular evolutionary biology, and systematics. She has 18 years of experience teaching in higher education, and is a contributing author to two biology textbooks. She received her B.S. from the University of California, Davis, and holds an M.S. and Ph.D. from Texas A & M University.

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**Dr. Thomas D. (Tom) Sharkey** has been a professor of Biochemistry and Molecular Biology since 2008. Before that he was a professor of Botany at UW-Madison for 20 years where he taught introductory biology. His research interests include metabolism, especially sucrose and starch metabolism during photosynthesis. He also studies how plants make hydrocarbons given off to the atmosphere. http://www.bch.msu.edu/faculty/sharkey.htm



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**Dr. Hideki Takahashi** has been an assistant professor in the Department of Biochemistry and Molecular Biology at Michigan State University since 2010. His research expertise is in the area of plant molecular biology. His research is focused on molecular mechanism of nutrient transport and metabolism, which has relevance to plant agriculture and biomass production. He received his B.S. from Kyoto University, Ph.D. from Chiba University, and did his postdoctoral work at Carnegie Institute of Science at Stanford University.

## Aparajita Banerjee

**Aparajita Banerjee** received her M.Sc. from Indian Institute of Technology, Bombay in 2005. After that she completed her MS in Chemistry from Michigan State University in 2008. She then joined the PhD program at the department of Biochemistry and Molecular Biology at Michigan State University in 2008. Currently, she is working with Dr. Sharkey as a graduate student on the regulation of the MEP pathway.

## **Course Description**

BS 161 covers sub-cellular and cellular biological processes. Topics include the structure, function and synthesis of macromolecules; the cellular generation and use of energy; and the replication, transmission and expression of genetic information in the cell's life cycle. Examples of these processes will be taken from organisms ranging from viruses to humans (are viruses organisms??). The primary goal of the course is to provide you, the student, with an understanding of basic biomolecular processes that you can transfer and apply to advanced courses and/or in self-directed study of relevant biology and biotechnology issues.

## **Course Objectives**

At the end of this course successful students will be able to do the following:

* Identify the structures of basic types of biomolecules and make predictions about the cellular functions of these molecules based on the chemical properties of these molecules.
* Describe the characteristics of cellular structures and relate these characteristics to their cellular functions.
* Explain the purpose of basic metabolic pathways and trace matter and energy through these pathways.
* Explain how cellular information is stored and used during cell growth and division.
* Explain the basic mechanisms used to control cellular processes.
* Analyze cellular processes and make prediction about how changes in these processes will alter cellular function.
* Interpret representations of data and scientific models and make predictions based on these representations.

## **Student Responsibility**

Study at MSU places a premium on self-motivation, and the responsibility for learning falls increasingly on you, the student, as you advance through your program. Ultimately the commitment and the dedication to learn must come from you. If you accept this responsibility, you will be provided an educational opportunity that can benefit you, and the society in which you live, regardless of your career path.

## **Required Course Materials**

### Desire2Learn (D2L) and Electronic Communications

Course materials including study aids and grades will all be posted on D2L (<https://d2l.msu.edu/>). We will also use the D2L mail system to send course announcements so you should be sure that this system is connected to your e-mail account, or you should check the D2L mail system regularly. We encourage the posting of questions regarding lecture material, homework, and readings on the D2L discussion forum. Please read the Discussion Forum Guidelines found in the Discussion Forum in D2L before posting. We will monitor this forum and respond on a regular basis. Your fellow students may also be able to help if you post your questions in this manner. Questions regarding grades, course mechanics, or of a personal nature should be sent by e-mail directly to Dr. Cognato. Questions concerning i>clicker2 registration should be sent to the graduate teaching assistant.

### Textbook

Campbell Biology 9th edition is the required text. This is an excellent, detailed, and comprehensive text that you will need to complete the homework, prepare for quizzes, and complement and supplement what you learn in class. We recommend that you keep this text after the course is over and use it as a reference resource in future science courses. It will also be valuable if you decide to take the MCAT or GRE.

### i>clicker2

This section of BS161 requires an i>clicker2. You will need this clicker every day of class including the first day. You can register you clicker online at <http://www.iclicker.com/support/registeryourclicker/> or before or after class during the first two weeks. If you register online, please use your MSU e-mail as your student ID. Clickers will be used for active learning questions during class. You can purchase an i>clicker2 from the bookstore or you can take advantage of ASMSU's free clicker rental program (<http://asmsu.msu.edu/services_iclicker.htm>). If you already have an original i>clicker and purchase an i>clicker2, you can receive a rebate (<http://www.iclicker.com/Customers/education/MichiganStateUniversityRebate/>). Bringing a friend's clicker to class when they cannot attend or giving your clicker to a classmate on days you cannot attend is academic dishonesty and will be treated as such.

### Mastering Biology

Campbell 9th edition textbook has an accompanying set of digital tools. Most of the course homework is done on the Mastering Biology website, [www.masteringbio.com](file:///C:\Users\BMB\AppData\Roaming\Microsoft\Word\www.masteringbio.com). When you sign up for this site you will need to use the course code **SHARKEY76006** and your MSU e-mail address. If you buy a new textbook from the bookstore the book will have an access code that provides access to the site without additional charge. If you buy a used textbook, you will need to purchase an access code for the site. This can be done online at www.masteringbio.com. You also have the option of buying an e-book + access to the site and can do this directly at www.masteringbio.com.

## **Time Management**

The MSU guidelines allow for instructors to assign **2 hours** of coursework outside of class for **every hour** spent in lecture each week. This means that for our class, you should expect to dedicate **6 hours each week outside of class on BS 161**. Those who are successful in this course are good managers of time--it is advisable to build into your schedule each week time to prepare for our class. Your coursework is a full time job. If you struggle with biology, need assistance with English, expect this time to be significantly increased.

## **Coursework**

There are three different types of graded coursework in this course.

### Homework

* **Purpose**: Lecture preparation, concept reinforcement, and exploration of current issues.
* **Location**: On **D2L** or the **Mastering Biology** website.
* **Description**: Assigned reading with a short assessment.
  + Each is worth **5** points.
  + There will be 25-30 throughout the semester (depending upon instructor assessment of student progress).
  + **Lowest 4 scores will be dropped**. This means you can miss 4 homework assignments without penalty.
  + **Represent 15%** of your final grade.
* **Policy**: It is your responsibility to check the Course Schedule and complete the homework on time.
  + These are to be done individually. Group work is not permitted.

### In-Class iClicker Questions

* **Purpose**: Promote classroom discussion and active learning.
* **Location**: During class
* **Description**: A set of multiple-choice iClicker questions given in lecture.
  + Each lecture set is **worth 2 points**.
  + **Lowest 4 scores will be dropped**. This means you can be absent from 4 classes without penalty.
  + **Represent 10%** of your total grade.
* **Policy**: It is your responsibility to have a functional clicker ready to participate.
  + If you forget your clicker, it will be treated as an absence, with 0 points for the day.
  + No makeups are permitted.
  + Using someone else’s clicker is considered cheating, and will result in a penalty grade.

### In-Class Activities

* **Purpose**: Interactive exploration of topics, reinforcement of concepts, expansion on concepts.
* **Location**: During class.
* **Description**: Variable types of group activities done in class.
  + **Examples**: investigation of a topic, video with questions, reading and interpretation.
  + Each is worth **10** points.
  + **Lowest 2 scores will be dropped**. This means you can miss 2 activities without penalty.
  + Represent **15**% of your total grade.
* **Policy:** Due by the end of lecture**.**
  + No makeups are permitted.

## **Examinations**

### Description

* There are 4 exams in this course, three mid-term exams and one final exam.
* All exams consist of multiple choice and matching type questions and will use scantron answer sheets.
* Each of the 3 mid-term exams will cover 10-12 lectures.
  + Exams 1, 2 and 3 are worth **100 points** each.
* Final Exam
  + Will cover 8 lectures (non-cumulative) + 24 questions on other material (cumulative).
  + Final exam is worth **150 points** (100 for new lectures, 50 for cumulative section).
* In total, exams represent **60%** of your grade.

### Schedule

1. Mid-term Exam 1, Monday, February 3.
2. Mid-term Exam 2, Friday, February 28. (Please note this is the **day before spring break**. Do not book travel before this exam is over!)
3. Mid-term Exam 3, Monday, April 7.
4. Final Exam, April 30, 10:00-12:00

### Exam Policy

We believe it is our responsibility to create an exam environment that promotes success and integrity. To do this, we have implemented the following exam policy.

* In order to respect the exam environment of others, **we ask that you do not ask questions during the exam**.
  + If you feel a question is ambiguous, a "challenge sheet" will be provided during the exam for you to explain your answer to, and interpretation of, a question.
  + If you intend to submit a challenge sheet, you must still enter your best answer on the scantron sheet and also on the challenge sheet.
  + This explanation sheet should be turned in to the instructor or TA at the end of the exam.
* **You must present a picture ID to hand in your completed exam.** Proctors will check you out of the exam when you turn in your exam.
* **BE ON TIME**. The exam start time will be noted.
  + Thedoors to the classroom will close **10 minutes after the start of the exam**, and you **will not be allowed** to take the exam after they close.
* Nothing can be on your desk or physical person except pencil(s) and an eraser, unless otherwise noted by the professor.
  + No chewing gum.
  + No drinks.
  + No food.
  + No electronics of any kind. This includes headphones.
  + No notes/papers (unless given explicit permission by the professor).
* Scantron answer sheet must be on your desk at all times, covered so that others cannot see your answers.
* Exam booklet may have markings, but none larger than the font on the page.
* Keep your eyes on your own paper.
* Do not talk during the exam.
* When finished with the exam, you can use electronics ONLY after you have exited the exam room.
* Exam booklets must be turned in before exiting the building.
* Information about the exam cannot be shared with others that have not yet taken the exam.

## **Attendance policy**

#### Attendance is not taken. However, you will not receive credit for missed in-class exercises if you do not attend class.

### Non-Exam Assignments

#### There are no makeup assignments allowed. Assignments in all categories (but exams) have built-in safeguards in case you miss a day. For example, 2 in-class activities will be dropped from your final grade. (See Point Values for Assignments and Exams).

### Missed Exams

#### If you know you in advance that you will be absent for a legitimate reason (see below), please contact Dr. Cognato in advance of the absence.

#### In case of emergency, please make every effort to notify Dr. Cognato on the day of the absence.

#### There are absolutely no make-up exams without a university-defined, legitimate excuse. Documentation may be required.

#### Make-up exams will be scheduled at a time convenient for student and instructor.

#### Make-up exams must be completed within 1 week of the absence.

#### Legitimate Excuses for Being Absent from Class: The University’s official policy on attendance and excused absences may be found at: <http://www.msu.edu/unit/ombud/excuses.html>. It is the student’s responsibility to be familiar with this policy.

* Make-up exams may consist of essay and short answer questions.

## **Grades**

Your grade in BS161 will be determined by your performance on the following assessments:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Points for Each** | **Total Assigned** | **Number Dropped** | **% of Grade** |
| **Homework** | 5\* | 25-30 | 4 | 15% |
| **In-class Activities** | 10\* | 8-10 | 2 | 15% |
| **In-class iClicker** | 2\* | Each lecture | 4 | 10% |
| **Mid-term Exams** | 100 | 3 | 0 | 60% |
| Final Exam | 150 | 1 | 0 |
| **Total** |  |  |  | **100%** |

\*You may notice how small the point values are for these items. We have them is **to encourage you to prepare for class time and to help you practice for the exams**. Many of the individual questions are very similar to exam questions, and if you make a genuine effort to do them, it will increase your scores on exams. This also means that sharing answers from classmates may very well get you some easy points on the quiz or homework, but will take away the value of practice for the exams and may result in charges of academic dishonesty.

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| --- | --- |
| Grade | Percentage Earned  This grading scale shows the percentage you must receive to guarantee a particular grade. The grades in the course will be adjusted if necessary based on the final distribution of scores. This adjustment may raise your grade from the scale shown here, but it will not lower your grade. |
| 4.0 | > 90% |
| 3.5 | > 85% |
| 3.0 | > 80% |
| 2.5 | > 75% |
| 2.0 | > 70% |
| 1.5 | > 65% |
| 1.0 | > 60% |
| 0.0 | <60% |

## **Classroom Etiquette**

## The instructors and students share a responsibility to create a classroom environment that promotes mutual respect, courtesy, and the freedom to learn. Thus, we have implemented a no-electronic policy for this course. This policy is as follows:

## Laptops may be used for activities related to class. Examples include viewing the e-book, taking notes, participation in in-class activities.

## Cell phones and tablets must be put away unless explicitly used for an in-class assignment. If you feel you must take a call, text, or post to Facebook, you may exit the classroom to do so.

Before you protest this policy, consider our classroom as training for your **future professional career**. Ask yourself the following question. In meetings with colleagues, supervisors, clients, investors--how might it impact your reputation if you were to surf, text, talk, Facebook, while they were speaking?

### MSU’s Policy on Classroom Etiquette

## Excerpts from [Academic Freedom for Students at Michigan State University](http://splife.studentlife.msu.edu/academic-freedom-for-students-at-michigan-state-university)

## Article 2: Academic Rights and Responsibilities

## III. A. *The student is responsible for learning the content of a course of study according to standards of performance established by the faculty and for adhering to standards of professional behavior established by the faculty.*

## III.B.4.  *The student’s behavior in the classroom shall be conducive to the teaching and learning process for all concerned.*

## III.B.10. *The student and the faculty share the responsibility for maintaining professional relationships based on mutual trust and civility.*

## Faculty have the right to remove students from the classroom for disruptive conduct.

## **Academic Integrity**

Academic Integrity is the cornerstone of science and of the University degree. Integrity is the foundation for trust in the quality of the education, and the degree, that is earned from an institution. Academic integrity is the responsibility of ALL of us. In this course, academic integrity is taken very seriously. Together, we can promote a culture of integrity at MSU and protect the value of your education.

Michigan State University has a long and proud history. We are all responsible for upholding the Spartan legacy of honesty, fairness, and integrity.

***As your professors, it is our responsibility to:***

* Create a learning environment that promotes success and integrity.
* Hold each of us accountable for behaving in ways that protect our personal integrity and the integrity of the MSU family.
* Use, to the best of our knowledge, our expertise to create a course that is fair and reasonable so that you do not feel tempted to compromise your integrity.
* Be available, as much as reasonable, to assist you with concerns, and reduce anxiety.

***As a student, it is your responsibility to***

* Safeguard your own integrity by adhering to instructor expectations regarding sharing of course work with others.
* Do your own work, when required.
* Encourage others to behave with integrity.
* Become familiar with MSU’s academic integrity policy (see section, Academic Integrity).

***How do I learn more about Academic Integrity at MSU?***

* An animated tutorial: <http://vudat.msu.edu/fileadmin/user_upload/vudat/flash/Academic_Integrity/academic_integrity.html>

### Academic Integrity

Academic dishonesty of any kind will result in a zero or penalty grade for the assignment or the entire course, and will be reported to the Dean of your College. Note that instructors are required to report academic dishonesty. Penalty grades are at the discretion of the instructor.

MSU states the following (in part) about academic honesty:

*“Academic honesty is central to the educational process and acts of academic dishonesty are serious offenses within the University community. Suspension from the University could be the consequence for acts of academic dishonesty.*

*Students should be familiar with General Student Regulation 1.00 on Protection of Scholarship and Grades, and with the all-University policy on Integrity of Scholarship and Grades. In addition, it is important that students clearly understand the specific expectations of their individual instructors with regard to this important matter. The process for adjudicating cases of academic dishonesty is outlined in Section 2.4 of Academic Freedom for Students at Michigan State University.”* – [MSU Student Handbook](http://splife.studentlife.msu.edu/regulations/types-of-rules-and-regulations-2)

### Plagiarism

If you use the same words as someone else you need to indicate that you are quoting that person. Even if you change a sentence a little bit you need to indicate you are paraphrasing and give the source where you found that wording. If you use someone else’s data, that is plagiarism. Stealing answers for an exam is universally recognized as cheating, but using someone else’s words appears to be less clear to some. It is important that you understand what plagiarism is, and that you avoid it. The MSU Office of the Ombudsman defines plagiarism as:

*Plagiarism (from the Latin* plagiarius*, an abductor, and* plagiare*, to steal) is defined by the White House Office of Science and Technology Policy on Misconduct in Research as “ . . . the appropriation of another person’s ideas, processes, results or words without giving appropriate credit.”*

*At MSU,* [*General Student Regulation 1.00*](http://splife.studentlife.msu.edu/regulations/general-student-regulations) *states in part that “no student shall claim or submit the academic work of another as one’s own.” (For the complete regulation, see* [*Protection of Scholarship and Grades*](http://splife.studentlife.msu.edu/regulations/general-student-regulations)*.)*

Plagiarism will result in a zero or penalty grade for the assignment or the entire course, and will be reported to the Dean of your College. Penalty grades are at the discretion of the instructor.

It is your responsibility to familiarize yourself with policies regarding academic integrity. Here are some useful links. This list does not include all policies.

1. Office of the Ombudsman Plagiarism Policy: <https://www.msu.edu/unit/ombud/plagiarism.html>
2. MSU Student Handbook [General Regulations](http://splife.studentlife.msu.edu/regulations/general-student-regulations)

### Group Work

All work in this course, with the exception of group in-class assignments, is to be done individually unless given permission by the instructor. We will work to make it clear when we would like you to engage in group learning and when we expect the work to be yours and yours alone. Ask if you have any doubt. Violation of this policy is cheating.