

## Term Information

Effective Term Autumn 2017

## General Information

Course Bulletin Listing/Subject Area Biology  
Fiscal Unit/Academic Org Introductory Biology - D0326  
College/Academic Group Arts and Sciences  
Level/Career Undergraduate  
Course Number/Catalog 1113E  
Course Title Biological Sciences: Energy Transfer and Development  
Transcript Abbreviation Energy Transfr&Dvl  
Course Description Exploration of biology and biological principles; evolution and the origin of life, cellular structure and function, bioenergetics, and genetics. A broad introduction to biology comprises both Biology 1113E and 1114E.  
Semester Credit Hours/Units Fixed: 4

## Offering Information

Length Of Course 14 Week, 12 Week, 8 Week, 7 Week, 6 Week  
Flexibly Scheduled Course Never  
Does any section of this course have a distance education component? No  
Grading Basis Letter Grade  
Repeatable No  
Course Components Laboratory, Lecture  
Grade Roster Component Lecture  
Credit Available by Exam No  
Admission Condition Course No  
Off Campus Never  
Campus of Offering Lima

## Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: Honors standing; and Math 1149 or 1150 or above, or Math Placement Level L. Prereq or concur: Chem 1210, 1610, or 1910H, or permission of course coordinator.  
Exclusions Not open to students with credit for Bio 115H.

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code 26.0101  
Subsidy Level Baccalaureate Course  
Intended Rank Freshman, Sophomore, Junior, Senior

## **Requirement/Elective Designation**

Required for this unit's degrees, majors, and/or minors

General Education course:

Biological Science

The course is an elective (for this or other units) or is a service course for other units

## **Course Details**

### **Course goals or learning objectives/outcomes**

- Successful students will be able to: Identify examples and list characteristics and general functions of the major classes of biological macromolecules.
- Successful students will be able to: Explain the activities in the cell by relating cellular structure and cellular function.
- Successful students will be able to: Explain the mechanisms and structures involved in mitotic and meiotic cell division, and explain the different roles for and consequences of each.
- Successful students will be able to: Explain the forms of energy utilized in biological systems and the laws of thermodynamics that govern them.
- Successful students will be able to: Explain the energy transformations involved in fermentation, cellular respiration, and photosynthesis.
- Successful students will be able to: Describe the nature and function of enzymes and describe major mechanisms used to control their activity.
- Successful students will be able to: Explain the transfer and modification of heritable traits from parents to offspring.
- Successful students will be able to: Describe the nature and expression of heritable information at the molecular level, including DNA replication, DNA repair, transcription, protein synthesis.
- Successful students will be able to: Apply Mendelian genetics to solve monohybrid and dihybrid crosses.
- Successful students will be able to: Identify examples of exceptions to strict Mendelian genetics.
- Successful students will be able to: Explain how genetic expression is controlled in prokaryotes and eukaryotes.
- Successful students will be able to: Describe the cellular response to its environment.
- Successful students will be able to: Describe how the loss/failure of cellular control mechanisms can cause cancer.
- Successful students will be able to: Explain cellular reproduction, growth, and differentiation in the context of organismal development.
- Successful students will be able to: Describe characteristics of viruses and bacteria.
- Successful students will be able to: Describe the experimental basis and select applications of recombinant DNA technology.
- Successful students will be able to: Describe the development and evaluation of scientific explanations of natural phenomena.
- Successful students will be able to: Apply biological concepts in the assessment of contemporary issues.

**Content Topic List**

- Evolution
- Origin of Life
- The Cell
- Membrane Structure & Function
- Enzymes
- Respiration & Photosynthesis
- Cell Cycle
- Mitosis
- Meiosis
- Mendelian Genetics & Inheritance
- Gene Expression
- Viruses
- Biotechnology

**Attachments**

- cover letter.docx: Cover Letter  
*(Cover Letter. Owner: Misicka, Matthew Alan)*
- 2016\_Autumn\_BIOLOGY\_1113\_AugustineJ.docx: SAMPLE 1113 Syllabus  
*(Syllabus. Owner: Misicka, Matthew Alan)*
- 2017\_Autumn\_BIOLOGY\_1113E.docx: PROPOSED 1113E Syllabus  
*(Syllabus. Owner: Misicka, Matthew Alan)*

**Comments**

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Misicka, Matthew Alan	10/31/2016 12:53 PM	Submitted for Approval
Approved	Misicka, Matthew Alan	10/31/2016 12:56 PM	Unit Approval
Approved	Fink, Steven Scott	11/01/2016 01:13 PM	College Approval
Pending Approval	Nolen, Dawn Vankeerbergen, Bernadette Chantal Hanlin, Deborah Kay Jenkins, Mary Ellen Bigler Hogle, Danielle Nicole	11/01/2016 01:13 PM	ASCCAO Approval
Pending Approval	Toohey, Meagan Elizabeth	11/03/2016 03:04 PM	Ad-Hoc Approval



20 October 2016

Re: Establishment of Honors Embedded BIO 1113E and BIO 1114E on the Lima Campus

Dear Curriculum Committee,

We are requesting that embedded honors sections be allowed for BIO 1113E and BIO 1114E on the Lima Campus. The primary rationale for the change is that we would like more flexibility in scheduling, given the change in course demand we are observing. That is, as more students are admitted with College Credit + and AP credit, demand for some of our introductory courses are projected to decrease. We foresee the possibility, for example, of not having enough demand to run separate honors sections in BIO 1113 and BIO 1114, in which case the ability to embed honors students would allow us to maintain our honors offerings.

The embedded honors courses will provide opportunities for embedded instruction, honors-only instruction, field trips, and honors-led group activities with their peers (peer-led teaching). We envision honors embedded courses to consist of an embedded lecture with a unique lab section just for honors students. BIO 1113E and 1114E have an additional hour of instruction which will allow for expanded course content and unique honors experiences.

Attached are detailed descriptions of the course details including the syllabi. Thank you for considering the addition of this honors embedded course.

Sincerely,

A handwritten signature in blue ink that reads 'Jacqueline Augustine'.

Dr. Jacqueline Augustine  
Associate Professor  
augustine.63@osu.edu, 419-995-8237

1) Enhanced student/faculty interaction

The course will offer students enhanced student/faculty interaction through an additional hour of classtime that would include just honors students and faculty.

Course set-up:

Embedded: 1-hour lectures, 3 times per week

Honors-only lab section: 3 hours per week

Honors-only enhanced interactions/recitation: 1 hour per week

2) Enhanced expectations and experiences

Because there will continue to be honor-only lab sections, and honors-only recitation, students will get ample opportunity to interact with other students pursuing the embedded option.

Additional enhancements to the honors experience will include at least two of the following:

- a. A related research project and enhanced laboratory experience. The honors course will conduct a DNA-based experiment which will involve DNA extraction, PCR, and electrophoresis. Most of the work will be conducted during the additional hour of classtime, but students may have to visit the experiment for brief periods outside of class.
- b. Develop a teaching tool related to the course. The students will brainstorm and develop teaching tools to give in-depth coverage of course material during the additional hour of instruction. They will vote on which teaching tool is the best. The teaching tool that was the best will then be presented to the embedded lecture, and the honors students will guide the other students. These activities will be used as review material before exams.
- c. Field trip to a research facility, prominently known guest speaker, or regional conference.
- d. Additional readings from the scholarly literature to enhance content. Students will be in charge of picking a manuscript and leading the discussion of the manuscript.
- e. Debate. Students may gather information and debate one or both sides of a topic, such as whether genetic experiments should be conducted on human subjects, the best way to combat global climate change, or whether hunting of bison and wolves should be allowed in Yellowstone.

3) A description of the grading

The same amount of points will be awarded for all material that is completed by both honors and non-honors students. Additional points will be awarded based on the additional work that is required. The embedded honors students grade will be awarded base on the number of points earned compared to the total number of points that were available. See the attached syllabi for additional details.

4) Place in the curriculum

This course is the first course for biology majors, and is required. It can also be used as a GE science course. It holds the same place in the curriculum map as BIO 1113 and 1114.

5) Attached syllabi.

The syllabus for the regular courses (BIO 1113 and BIO 1114) and the honors embedded addendum.

**ENERGY TRANSFORMATION & DEVELOPMENT – BIO 1113**  
**AUTUMN 2016**  
**OHIO STATE UNIVERSITY AT LIMA**

**DR. JACKIE AUGUSTINE**

Office: Science 330 (behind the elevators)

Phone: 419-995-8237

Email: augustine.63@osu.edu

Open Study Hours: Mondays 1:30-3pm (Science 370)

Additional Study Help: Any time office door is open, or by appointment

**COURSE DESCRIPTION:**

Biology 1113 is intended for students majoring in the natural sciences and is the first course in a two-semester sequence. In this course, you will investigate the chemistry of life, cell structure and function, energy transfer, and genetics. The 4 credit hours for this course include both lecture and lab. Students are required to enroll in lecture and lab sections concurrently.

**PREREQUISITES:**

Not open to students with credit for BIO 113. This course is eligible for credit by examination (EM); See <http://testing.osu.edu> for more information.

**COURSE FORMAT:**

BIO 1113 consists of three 55-minute lectures and one 3-hour lab per week.

**REQUIRED MATERIALS:**

1. A textbook – you can purchase either the printed or etext versions. This textbook is used in BIO 1114 and may be used in BIO 3401.  
Reece, J. B., L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, and R. B. Jackson. (2014) Campbell Biology, 10<sup>th</sup> Edition. Benjamin Cummings, San Francisco, CA.
  - a. ISBN-13: 9780321974587 (loose leaf version – great if you only want to carry around one chapter at a time; cannot sell the book back to the bookstore when finished)
  - b. ISBN-13: 9780321775658 (hard cover – can sell back, but heavy)
  - c. Etext available at <http://www.masteringbiology.com/site/register/new-students.html>
  
2. Mastering Biology Access Code for 10<sup>th</sup> Edition (10e).
  - a. \$68.95 if purchased online  
at <http://www.masteringbiology.com/site/register/new-students.html>
  - b. NOTE: I encourage you to purchase this with a new book or from the website. Second-hand (used) copies are NOT guaranteed to work. Buy used access codes at your own risk.

**MASTERING BIOLOGY**

Biology 1113 uses online, interactive homework to reinforce learning. Mastering Biology can be used for any course that uses Campbell Biology 10e.

## Student Responsibilities

- Go to: <http://www.masteringbiology.com/site/register/new-students.html>
- Select “OK! Register now.”
- Enter the following course ID: **BIO1113AUTUMN2016AUGUSTINE**
- Select “Continue”
- Because you have probably never used mastering biology before, select “Create” to set up an account.
- Enter the information on the page and select ‘Create Account’.
- Now you have the opportunity to enter your access code if you bought one from the bookstore, OR buy an access code with a credit card. Follow the prompts.
  - You have the opportunity to purchase an eText if you would like, but it is not required. (access code alone = \$68.95; etext + access = \$115.95)
- Register as soon as possible. Registration problems should be resolved several days before the due date, and is not an excuse for not turning in homework.
- <http://www.pearsonmylabandmastering.com/northamerica/masteringbiology/students/support/index.html> also has helpful video tutorials.

## Warnings

- Access codes that are not bought through the bookstore or the mastering biology website may not be for the right book or the right edition.
- If a website offers a used textbook with an access code, the access code may already have been used and it will not work for you.
- Subscriptions cannot be transferred from one person to another.

## GRADING POLICY:

Lecture and laboratory sections are graded together. Course grades will be based upon the percentage of total points that the student accumulates from assignments. The course grade will be determined as follows:

Exams 1-7 (50 points each) .....	350 points
Final Exam (50 points new material, 50 points cumulative) .....	100 points
Mastering Biology (7 points each * 10 assignments) .....	70 points
New York Times Discussion (6 points each*6 readings, lowest dropped) .....	30 points
Post-Lab Quizzes (4 points each*7 labs, lowest dropped).....	24 points
Topic + references .....	5 points
Outline .....	6 points
Draft.....	25 points
Research proposal.....	50 points
Peer evaluation of participation.....	20 points
Lab Presentation.....	20 points
<b>Total .....</b>	<b>700 points</b>

The distribution for a letter grade is based upon the following grade scale:

92-100% = A	82-87% = B	72-77% = C	62-67% = D
90-91% = A-	80-81% = B-	70-71% = C-	60-61% = D-
88-89% = B+	78-79% = C+	68-69% = D+	0-59% = F



### **EXPLANATION OF GRADED ITEMS:**

*Exams* will cover all assigned reading material, assignments, and information given during lecture, lab and recitation. The exam may consist of multiple choice, fill-in-the-blank, and short essay. Although only the Final Exam is designated as cumulative, I do expect the student to retain major concepts and principles throughout the semester. Short-answer questions will be graded on completeness and accuracy of answer, proper grammar and syntax.

*Mastering Biology Questions* will be assigned and are awarded based on correct answers. See the Mastering Biology section above for more details on how to register.

*New York Times discussion* points are awarded based on your contribution to discussions of the selected readings from the New York Times. A list of questions concerning the assigned reading will be given a week prior to the discussion of that reading. You should read the assigned selection weekly, have answers to the prepared questions ready, and come with additional comments and questions about the reading.

*Post-laboratory quizzes* test your accuracy in lab exercises. They are given in Carmen. The quiz will remain hidden until after the lab, and will only be unlocked for students that attend the entire laboratory session. You may use your notes taken during lab to complete the quiz.

*The research proposal* will describe the background and methodology for addressing a biological challenge. Your group will be responsible for conducting research, formulating ideas, and writing a research proposal. The *Topic + References*, *Outline*, and *Draft* will ensure that you are making adequate progress and allow the instructor to give constructive feedback before the final research paper is due.

The *peer evaluation of participation* will allow peers to critique your contribution to the research, idea formulation, writing and editing of each paper.

*The lab presentation* is designed to give students the opportunity to present the results of one of the in-class laboratory exercises to the other students in the class. The presentation should follow the scientific format (Introduction, Methods, Results, Discussion). More details will be given in a separate handout.

### **GENERAL EXPECTATIONS AND ATTENDANCE:**

Students are responsible for all information given during class whether the student is in attendance or not. Students who miss class are responsible for getting missed material including handouts from classmates—Check Carmen and e-mail regularly for announcements. Missing class due to “outside interests” including jobs and extracurricular activities will not be given special consideration by the instructor; I will not distinguish between excused and unexcused absences.

### **LECTURE NOTES:**

Simplified PowerPoint lectures for a given lecture will be posted on Carmen by 10pm the previous day. The notes posted on Carmen will be missing key terms and descriptions of examples, to encourage attendance and active participation during class.

### **MISSED EXAMS:**

If you know in advance that you will not be present during a scheduled exam, please contact the instructor to set up an alternate time *before* the scheduled exam. If you are ill or there is

some other emergency the day of the exam, the instructor **MUST** be notified on the day of the exam and provided documentation to support the reason for your absence within one week. There is little I can do for you after the exam has been held and you have made no effort to contact me. Make-up exams may be entirely essay and different from the regular exam. The student is allowed only **ONE** hourly make-up exam. All other missed exams, regardless of the reason, will result in a **ZERO**. **The make-up exam must be taken no later than 48 hours from the scheduled exam**; the time must be arranged directly with the instructor.

*Note on extended absences:* If you must miss more than two classes due to extended illness, a doctor's excuse should be given to the instructor. **THE STUDENT MUST NOTIFY THE INSTRUCTOR WITHIN 48 HOURS OF THE SECOND MISSED CLASS** (submission via email preferred). Upon the student's return, the student and the instructor will prepare a schedule to turn in and complete missed work and exams.

### **UNIVERSITY EXPECTATIONS REGARDING 2:1 RATIO OF STUDENT EFFORT**

In an effort to establish educational standards and expectations for all institutions of higher education in the state, the Ohio Board of Regents has established formal guidelines to standardize the length of semesters, academic years, and define the practical meaning of each semester hour of credit. As part of these guidelines, the Board of Regents' guidelines state that one semester credit hour will be awarded for a minimum of 750 minutes of formalized instruction, and that "students will be expected to work at out-of-class assignments on a regular basis, which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity."

### **CAMPUS CLOSURES OR DELAYS:**

When weather conditions warrant closing the campus, we will inform the campus community via Buckeye Alert (see the next point regarding how to sign up for Buckeye Alert). We will also notify local media by 6:00 a.m. whenever possible. Local radio and television carry these announcements, and the stations carrying our notifications are listed on our website. The Ohio State University at Lima web site (<http://lima.osu.edu/>) also reports campus closings or delays. If weather forces a delayed schedule, classes will generally resume at noon. Activities or classes scheduled to begin on or after the delayed time will be conducted in a normal manner with students held responsible for any material presented. For example, if the university delays until noon, any class that begins at noon or after will begin at its normal time. Classes scheduled to begin before noon are canceled for the day.

### **BUCKEYE ALERT SYSTEM:**

You must sign up for Buckeye Alert to be notified via text message of any campus delays or cancellations. You will not be notified of any individual class cancellations via Buckeye Alert.

- Go to <http://eprofile.osu.edu>
- Use your OSU name.# and password to login
- Click on "Phone Numbers"
- Enter your cell number in the "Cellular" field
- Click save

At that point, you are registered for Buckeye Alert!

### **STUDENT RESOURCES**

For general reference on issues such as the OSU Code of Student Conduct, Academic Misconduct, Disability Services, Campus Computing, E-mail Services, Web Services, Buck ID, and Weather Cancellations Policy, please read "Guidelines for Students," a guide for

student conduct (<http://lima.osu.edu/current-students/fye/student-resource-guide.html> ). Ohio State University's Code of Student Conduct can be found here: <http://studentlife.osu.edu/csc/>

### **ACADEMIC HONESTY:**

The Ohio State University's Code of Student Conduct defines academic misconduct as “any activity that tends to compromise the academic integrity of the university or subvert the educational process”, and includes all forms of student academic misconduct wherever committed. It is illustrated by, but not limited to, cases of plagiarism, collusion (unauthorized collaboration), copying the work of another student, and dishonest practices in connection with examinations and written papers. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so students should review the Code of Student Conduct and pay particular attention to the sections dealing with academic misconduct. Instructors shall report all instances of alleged academic misconduct to the Committee on Academic Misconduct (Faculty Rule 3335-5-487). It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. For additional information, see the Code of Student Conduct (<http://studentaffairs.osu.edu/csc/>).

### **ACCOMMODATIONS FOR DISABILITIES:**

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let your instructor know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. As soon as possible, after registration with Disability Services, make arrangements with me to discuss your accommodation needs so that they may be implemented in a timely fashion. Karen Meyer is the Coordinator of Disability Services at the Ohio State Lima. The Disability Services office is located in the Heath Learning Center, and Karen is available for appointments by calling 419-995-8453. Her e-mail address is [meyer.193@osu.edu](mailto:meyer.193@osu.edu).

### **COUNSELING SERVICES:**

If you are experiencing personal difficulties, whether related to class or not, please know that you have access to confidential services provided by the OSU Lima Counseling and Consultation Services (LCCS). All current OSU Lima students are eligible for services at no charge. Please contact LCCS at 419-995-8272 or 419-995-8698 to schedule an appointment.

### **STUDENT ADVOCACY:**

If you are experiencing difficulties navigating the campus experience, you have access to the services provided by the OSU Lima Student Advocacy Center. The Center will help with financial distress, cut through red tape, familiarize students with university policies and procedures, and link students to appropriate resources. All current OSU students are eligible for services at no charge. Please contact Gail Nelson at 419-995-8698 or [nelson.700@osu.edu](mailto:nelson.700@osu.edu).

### **STATEMENT ON DIVERSITY:**

As a member of the faculty of the Department of Evolution, Ecology, and Organismal Biology, I support my department's commitment to diversity and inclusion as stated in EEOB's suggested syllabus statement: “The Department of EEOB strives to create and maintain a welcoming climate for our faculty, staff, and students. Diversity enhances all aspects of our academic efforts including our research, teaching, and service. Diversity provides multiple experiences, generates multiple perspectives, and promotes the free exchange of ideas. We

make this commitment to enhance our ability, and that of our students, to understand the biological world and apply that understanding to address problems confronting society. For more information on diversity at OSU, please see OSU diversity resources (<https://www.osu.edu/initiatives/diversity.html>).”

**STATEMENT REGARDING TOBACCO FREE CAMPUS POLICY:**

Ohio State has adopted a tobacco free policy that supports a healthy environment for all members of the campus community. The use of all types of tobacco products is prohibited in all university buildings and on all university-owned properties, including parking lots and all outside areas. The full policy can be found at <http://hr.osu.edu/public/documents/policy/resources/720faq.pdf?t=2014724155314>.

**STUDENT GRIEVANCES PROCESS:**

Students should seek to resolve a grievance concerning a course, grade, or related matter by speaking first with the instructor or professor. If the student and the instructor cannot arrive at a mutually agreeable resolution, the student may take the complaint to the program coordinator (or the Associate Dean in the absence of a coordinator). The program coordinator will investigate the matter as fairly as possible and provide a response to both the student and the affected instructor. After that point, the student may request a hearing with the Associate Dean if the issue has not been resolved.

**BIOLOGY 1113 LEARNING OUTCOMES:** Successful students will be able to:

1. Identify examples and list characteristics and general functions of the major classes of biological macromolecules (carbohydrates, lipids, proteins, nucleic acids).
2. Explain the activities in the cell by relating cellular structure and cellular function.
3. Explain the mechanisms and structures involved in mitotic and meiotic cell division, and explain the different roles for and consequences of each.
4. Explain the forms of energy utilized in biological systems and the laws of thermodynamics that govern them.
5. Explain the energy transformations involved in fermentation, cellular respiration, and photosynthesis (including orderly chemical transformations, the relevance of redox reactions, and electron/proton transport).
6. Describe the nature and function of enzymes and describe major mechanisms used to control their activity.
7. Explain the transfer and modification of heritable traits from parents to offspring.
8. Describe the nature and expression of heritable information at the molecular level, including DNA replication, DNA repair, transcription, protein synthesis.
9. Apply Mendelian genetics to solve monohybrid and dihybrid crosses.
10. Identify examples of exceptions to strict Mendelian genetics.
11. Explain how genetic expression is controlled in prokaryotes and eukaryotes.
12. Describe the cellular response to its environment (e.g. membrane transport, signal transduction).
13. Describe how the loss/failure of cellular control mechanisms can cause cancer.
14. Explain cellular reproduction, growth, and differentiation in the context of organismal development.
15. Describe characteristics of viruses and bacteria (e.g., life history genome type and content, exchange of genetic material).
16. Describe the experimental basis and select applications of recombinant DNA technology.
17. Describe the development and evaluation of scientific explanations of natural phenomena.
18. Apply biological concepts in the assessment of contemporary issues.

### **GENERAL EDUCATION CURRICULUM GOALS & OBJECTIVES:**

This course fulfills the requirements for General Education: Natural Sciences: Biological Sciences. Courses in the Natural Sciences foster an understanding of the principles, theories and methods of modern science, the relationship between science and technology and the effects of science and technology on the environment.

### **Learning Objectives:**

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

### **How students meet the GEC objectives through this course:**

In Biology 1113, Biological Sciences majors meet the GEC Natural Science Learning Objectives in multiple ways. The course, in conjunction with Biology 1114, is an in-depth study of the laws, structures, and interrelationships within the biological universe. Students gain an understanding of the foundations of modern biology by studying cell structure and function, bioenergetics, genetics, and early animal development. In the laboratory activities, students not only reinforce the biological concepts introduced in lecture, but also learn scientific reasoning and methods. Through the study of the history and key discoveries in biology, Biology 1113 students learn the details of the interrelationship between technology and scientific methods in the modern investigative study of biology, and gain an appreciation of the social and philosophical ramifications of our knowledge of biology and biological discoveries.

**SCHEDULE:** \*Chapters in Campbell Biology textbook; #Mastering Biology Homework Due at 12:20pm (beginning of lecture); + New York Times Reading Due

Week	Date	Lecture Topic	Chapter*	Lab
1	Aug 24	Introduction to BIO 1113	1	1: Scientific Reporting
	Aug 26	Themes in Biology	1	
2	Aug 29	Water	3	2: Chemistry of Life: Molecules & Water
	Aug 31	Macromolecules	5	
	Sept 2#	Macromolecules	5	
3	Sept 5	<i>No class: Labor Day!</i>		+3: Chemistry of Life: Food Lab
	Sept 7	Macromolecules	5	
	Sept 9#	Metabolism	8	
4	Sept 12	<b>Exam 1</b>	<b>1, 3, 5</b>	4: Enzymes
	Sept 14	Metabolism	8	
	Sept 16#	DNA Structure	16	
5	Sept 19	DNA Replication	16	+Intro to Scientific Inquiry
	Sept 21	DNA Replication	16	
	Sept 23#	Genes to Proteins	17	
6	Sept 26	<b>Exam 2</b>	<b>8, 16</b>	<b>Topic &amp; References Due</b>
	Sept 28	Genes to Proteins	17	
	Sept 30 #	Gene Expression	18	
7	Oct 3	Gene Expression	18	<b>+Outline Due</b>
	Oct 5	Gene Expression	18	
	Oct 7#	Biotechnology	20	
8	Oct 10	<b>Exam 3</b>	<b>17-18</b>	<i>No lab – Fall Break</i>
	Oct 12	Genomic Evolution	21	
	Oct 14	<i>No class: Fall Break!</i>		
9	Oct 17	Viruses	19	+5: Cell Lab
	Oct 19	Cell Structure	6	
	Oct 21	<b>Exam 4</b>	<b>19-21</b>	
10	Oct 24	Cell Structure	6	<b>Draft 1 Due</b>
	Oct 26	Cell Membranes	7	
	Oct 28#	Cell Cycle	12	
11	Oct 31	<b>Exam 5</b>	<b>6-7</b>	+Group Work
	Nov 2	Cell Cycle	12	
	Nov 4#	Meiosis	13	
12	Nov 7	Meiosis	13	+6: Mendelian Genetics: Fly Lab Group Work
	Nov 9	<b>Exam 6</b>	<b>12-13</b>	
	Nov 11	<i>No class – Veteran's Day</i>		
13	Nov 14	Mendel & Genes	14	<b>Final Research Proposal Due, Peer Review</b>
	Nov 16	Chromosomal Inheritance	15	
	Nov 18#	Chromosomal Inheritance	15	
14	Nov 21	<b>Exam 7</b>	<b>14-15</b>	No labs – Thanksgiving
	Nov 23	<i>No class: Thanksgiving</i>		
	Nov 25	<i>No class: Thanksgiving</i>		
15	Nov 28	Cell Communication	11	7: Photosynthesis & Respiration <b>Proposal Presentations</b>
	Nov 30	Cellular Respiration	9	
	Dec 2#	Cellular Respiration	9	
16	Dec 5	Photosynthesis	10	No labs
	Dec 7	Photosynthesis	10	
17	Dec 9	<b>Final Exam:</b> 12:00-1:45pm in Galvin 118; 50 points from Chapters 9-11; 50 points cumulative (all Campbell Chapters we covered)		

**ENERGY TRANSFORMATION & DEVELOPMENT – BIO 1113E**  
**HONORS EMBEDDED VERSION**  
**PROPOSED**  
**OHIO STATE UNIVERSITY AT LIMA**

**DR. JACKIE AUGUSTINE**

Office: Science 330 (behind the elevators)

Phone: 419-995-8237

Email: augustine.63@osu.edu

Open Study Hours: Mondays 1:30-3pm (Science 370)

Additional Study Help: Any time office door is open, or by appointment

**COURSE DESCRIPTION:**

Biology 1113 is intended for students majoring in the natural sciences and is the first course in a two-semester sequence. In this course, you will investigate the chemistry of life, cell structure and function, energy transfer, and genetics. The 4 credit hours for this course include both lecture and lab. Students are required to enroll in lecture and lab sections concurrently.

**PREREQUISITES:**

Not open to students with credit for BIO 113. This course is eligible for credit by examination (EM); See <http://testing.osu.edu> for more information.

**COURSE FORMAT:**

BIO 1113 consists of three 55-minute lectures and one 3-hour lab per week.

**REQUIRED MATERIALS:**

1. A textbook – you can purchase either the printed or etext versions. This textbook is used in BIO 1114 and may be used in BIO 3401.
  - Reece, J. B., L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, and R. B. Jackson. (2014) Campbell Biology, 10<sup>th</sup> Edition. Benjamin Cummings, San Francisco, CA.
  - a. ISBN-13: 9780321974587 (loose leaf version – great if you only want to carry around one chapter at a time; cannot sell the book back to the bookstore when finished)
  - b. ISBN-13: 9780321775658 (hard cover – can sell back, but heavy)
  - c. Etext available at <http://www.masteringbiology.com/site/register/new-students.html>
  
2. Mastering Biology Access Code for 10<sup>th</sup> Edition (10e).
  - a. \$68.95 if purchased online  
at <http://www.masteringbiology.com/site/register/new-students.html>
  - b. NOTE: I encourage you to purchase this with a new book or from the website. Second-hand (used) copies are NOT guaranteed to work. Buy used access codes at your own risk.

**MASTERING BIOLOGY**

Biology 1113 uses online, interactive homework to reinforce learning. Mastering Biology can be used for any course that uses Campbell Biology 10e.

## Student Responsibilities

- Go to: <http://www.masteringbiology.com/site/register/new-students.html>
- Select “OK! Register now.”
- Enter the following course ID: **BIO1113AUTUMN2016AUGUSTINE**
- Select “Continue”
- Because you have probably never used mastering biology before, select “Create” to set up an account.
- Enter the information on the page and select ‘Create Account’.
- Now you have the opportunity to enter your access code if you bought one from the bookstore, OR buy an access code with a credit card. Follow the prompts.
  - You have the opportunity to purchase an eText if you would like, but it is not required. (access code alone = \$68.95; etext + access = \$115.95)
- Register as soon as possible. Registration problems should be resolved several days before the due date, and is not an excuse for not turning in homework.
- <http://www.pearsonmylabandmastering.com/northamerica/masteringbiology/students/support/index.html> also has helpful video tutorials.

## Warnings

- Access codes that are not bought through the bookstore or the mastering biology website may not be for the right book or the right edition.
- If a website offers a used textbook with an access code, the access code may already have been used and it will not work for you.
- Subscriptions cannot be transferred from one person to another.

## GRADING POLICY:

Lecture and laboratory sections are graded together. Course grades will be based upon the percentage of total points that the student accumulates from assignments. The course grade will be determined as follows:

Exams 1-7 (50 points each) .....	350 points
Final Exam (50 points new material, 50 points cumulative) .....	100 points
Mastering Biology (7 points each * 10 assignments) .....	70 points
New York Times Discussion (6 points each*6 readings, lowest dropped) .....	30 points
Post-Lab Quizzes (4 points each*7 labs, lowest dropped).....	24 points
Topic + references .....	5 points
Outline .....	6 points
Draft.....	25 points
Research proposal.....	50 points
Peer evaluation of participation.....	20 points
Lab Presentation.....	20 points

## Honors Components

Discussions of primary literature (6 points each*6 readings, lowest dropped) .....	30 points
Discussion leader of primary literature.....	15 points
Field Trip Attendance and Journal .....	20 points
Development and execution of peer-led teaching project .....	35 points
<b>Total .....</b>	<b>800 points</b>



The distribution for a letter grade is based upon the following grade scale:

92-100% = A	82-87% = B	72-77% = C	62-67% = D
90-91% = A-	80-81% = B-	70-71% = C-	60-61% = D-
88-89% = B+	78-79% = C+	68-69% = D+	0-59% = F

### **EXPLANATION OF GRADED ITEMS:**

*Exams* will cover all assigned reading material, assignments, and information given during lecture, lab and recitation. The exam may consist of multiple choice, fill-in-the-blank, and short essay. Although only the Final Exam is designated as cumulative, I do expect the student to retain major concepts and principles throughout the semester. Short-answer questions will be graded on completeness and accuracy of answer, proper grammar and syntax.

*Mastering Biology Questions* will be assigned and are awarded based on correct answers. See the Mastering Biology section above for more details on how to register.

*New York Times and Primary Literature discussion* points are awarded based on your contribution to discussions of the selected readings from the New York Times and peer-reviewed literature. A list of questions concerning the assigned reading will be given a week prior to the discussion of that reading. You should read the assigned selection weekly, have answers to the prepared questions ready, and come with additional comments and questions about the reading.

*Discussion leader for primary literature.* When you are the discussion leader, you are responsible for choosing which peer-reviewed manuscript to read, creating the discussion questions, and leading the discussion for that week.

*Post-laboratory quizzes* test your accuracy in lab exercises. They are given in Carmen. The quiz will remain hidden until after the lab, and will only be unlocked for students that attend the entire laboratory session. You may use your notes taken during lab to complete the quiz.

*The research proposal* will describe the background and methodology for addressing a biological challenge. Your group will be responsible for conducting research, formulating ideas, and writing a research proposal. The *Topic + References, Outline, and Draft* will ensure that you are making adequate progress and allow the instructor to give constructive feedback before the final research paper is due.

The *peer evaluation of participation* will allow peers to critique your contribution to the research, idea formulation, writing and editing of each paper.

*The lab presentation* is designed to give students the opportunity to present the results of one of the in-class laboratory exercises to the other students in the class. The presentation should follow the scientific format (Introduction, Methods, Results, Discussion). More details will be given in a separate handout.

*Field Trip.* Honors students are required to go on a half-day field trip that will be announced during the first week of class. Students should make family and work arrangements so that they are available. The field trip is designed to give students first-hand experience with the application of classroom material.

*Peer-led teaching project.* Studies show that students learn best when taught by other students. Both the leader and the students learn more than from just listening to traditional lectures. You will get the opportunity to develop curricular material, and lead your peer through the exercise.

#### **GENERAL EXPECTATIONS AND ATTENDANCE:**

Students are responsible for all information given during class whether the student is in attendance or not. Students who miss class are responsible for getting missed material including handouts from classmates—Check Carmen and e-mail regularly for announcements. Missing class due to “outside interests” including jobs and extracurricular activities will not be given special consideration by the instructor; I will not distinguish between excused and unexcused absences.

#### **LECTURE NOTES:**

Simplified PowerPoint lectures for a given lecture will be posted on Carmen by 10pm the previous day. The notes posted on Carmen will be missing key terms and descriptions of examples, to encourage attendance and active participation during class.

#### **MISSED EXAMS:**

If you know in advance that you will not be present during a scheduled exam, please contact the instructor to set up an alternate time *before* the scheduled exam. If you are ill or there is some other emergency the day of the exam, the instructor **MUST** be notified on the day of the exam and provided documentation to support the reason for your absence within one week. There is little I can do for you after the exam has been held and you have made no effort to contact me. Make-up exams may be entirely essay and different from the regular exam. The student is allowed only **ONE** hourly make-up exam. All other missed exams, regardless of the reason, will result in a **ZERO**. **The make-up exam must be taken no later than 48 hours from the scheduled exam;** the time must be arranged directly with the instructor.

*Note on extended absences:* If you must miss more than two classes due to extended illness, a doctor’s excuse should be given to the instructor. **THE STUDENT MUST NOTIFY THE INSTRUCTOR WITHIN 48 HOURS OF THE SECOND MISSED CLASS** (submission via email preferred). Upon the student’s return, the student and the instructor will prepare a schedule to turn in and complete missed work and exams.

#### **UNIVERSITY EXPECTATIONS REGARDING 2:1 RATIO OF STUDENT EFFORT**

In an effort to establish educational standards and expectations for all institutions of higher education in the state, the Ohio Board of Regents has established formal guidelines to standardize the length of semesters, academic years, and define the practical meaning of each semester hour of credit. As part of these guidelines, the Board of Regents’ guidelines state that one semester credit hour will be awarded for a minimum of 750 minutes of formalized instruction, and that “students will be expected to work at out-of-class assignments on a regular basis, which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity.”

#### **CAMPUS CLOSURES OR DELAYS:**

When weather conditions warrant closing the campus, we will inform the campus community via Buckeye Alert (see the next point regarding how to sign up for Buckeye Alert). We will also notify local media by 6:00 a.m. whenever possible. Local radio and television carry these announcements, and the stations carrying our notifications are listed on our website. The Ohio State University at Lima web site (<http://lima.osu.edu/>) also reports campus closings or

delays. If weather forces a delayed schedule, classes will generally resume at noon. Activities or classes scheduled to begin on or after the delayed time will be conducted in a normal manner with students held responsible for any material presented. For example, if the university delays until noon, any class that begins at noon or after will begin at its normal time. Classes scheduled to begin before noon are canceled for the day.

### **BUCKEYE ALERT SYSTEM:**

You must sign up for Buckeye Alert to be notified via text message of any campus delays or cancellations. You will not be notified of any individual class cancellations via Buckeye Alert.

- Go to <http://eprofile.osu.edu>
- Use your OSU name.# and password to login
- Click on "Phone Numbers"
- Enter your cell number in the "Cellular" field
- Click save

At that point, you are registered for Buckeye Alert!

### **STUDENT RESOURCES**

For general reference on issues such as the OSU Code of Student Conduct, Academic Misconduct, Disability Services, Campus Computing, E-mail Services, Web Services, Buck ID, and Weather Cancellations Policy, please read "Guidelines for Students," a guide for student conduct (<http://lima.osu.edu/current-students/fye/student-resource-guide.html>). Ohio State University's Code of Student Conduct can be found here: <http://studentlife.osu.edu/csc/>

### **ACADEMIC HONESTY:**

The Ohio State University's Code of Student Conduct defines academic misconduct as "any activity that tends to compromise the academic integrity of the university or subvert the educational process", and includes all forms of student academic misconduct wherever committed. It is illustrated by, but not limited to, cases of plagiarism, collusion (unauthorized collaboration), copying the work of another student, and dishonest practices in connection with examinations and written papers. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so students should review the Code of Student Conduct and pay particular attention to the sections dealing with academic misconduct. Instructors shall report all instances of alleged academic misconduct to the Committee on Academic Misconduct (Faculty Rule 3335-5-487). It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. For additional information, see the Code of Student Conduct (<http://studentaffairs.osu.edu/csc/>).

### **ACCOMMODATIONS FOR DISABILITIES:**

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let your instructor know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. As soon as possible, after registration with Disability Services, make arrangements with me to discuss your accommodation needs so that they may be implemented in a timely fashion. Karen Meyer is the Coordinator of Disability Services at the Ohio State Lima. The Disability Services office is located in the Heath Learning Center, and Karen is available for appointments by calling 419-995-8453. Her e-mail address is [meyer.193@osu.edu](mailto:meyer.193@osu.edu).

### **COUNSELING SERVICES:**

If you are experiencing personal difficulties, whether related to class or not, please know that you have access to confidential services provided by the OSU Lima Counseling and Consultation Services (LCCS). All current OSU Lima students are eligible for services at no charge. Please contact LCCS at 419-995-8272 or 419-995-8698 to schedule an appointment.

### **STUDENT ADVOCACY:**

If you are experiencing difficulties navigating the campus experience, you have access to the services provided by the OSU Lima Student Advocacy Center. The Center will help with financial distress, cut through red tape, familiarize students with university policies and procedures, and link students to appropriate resources. All current OSU students are eligible for services at no charge. Please contact Gail Nelson at 419-995-8698 or [nelson.700@osu.edu](mailto:nelson.700@osu.edu).

### **STATEMENT ON DIVERSITY:**

As a member of the faculty of the Department of Evolution, Ecology, and Organismal Biology, I support my department's commitment to diversity and inclusion as stated in EEOB's suggested syllabus statement: "The Department of EEOB strives to create and maintain a welcoming climate for our faculty, staff, and students. Diversity enhances all aspects of our academic efforts including our research, teaching, and service. Diversity provides multiple experiences, generates multiple perspectives, and promotes the free exchange of ideas. We make this commitment to enhance our ability, and that of our students, to understand the biological world and apply that understanding to address problems confronting society. For more information on diversity at OSU, please see OSU diversity resources (<https://www.osu.edu/initiatives/diversity.html>)."

### **STATEMENT REGARDING TOBACCO FREE CAMPUS POLICY:**

Ohio State has adopted a tobacco free policy that supports a healthy environment for all members of the campus community. The use of all types of tobacco products is prohibited in all university buildings and on all university-owned properties, including parking lots and all outside areas. The full policy can be found at <http://hr.osu.edu/public/documents/policy/resources/720faq.pdf?t=2014724155314>.

### **STUDENT GRIEVANCES PROCESS:**

Students should seek to resolve a grievance concerning a course, grade, or related matter by speaking first with the instructor or professor. If the student and the instructor cannot arrive at a mutually agreeable resolution, the student may take the complaint to the program coordinator (or the Associate Dean in the absence of a coordinator). The program coordinator will investigate the matter as fairly as possible and provide a response to both the student and the affected instructor. After that point, the student may request a hearing with the Associate Dean if the issue has not been resolved.

### **BIOLOGY 1113 LEARNING OUTCOMES:** Successful students will be able to:

1. Identify examples and list characteristics and general functions of the major classes of biological macromolecules (carbohydrates, lipids, proteins, nucleic acids).
2. Explain the activities in the cell by relating cellular structure and cellular function.
3. Explain the mechanisms and structures involved in mitotic and meiotic cell division, and explain the different roles for and consequences of each.
4. Explain the forms of energy utilized in biological systems and the laws of thermodynamics that govern them.

5. Explain the energy transformations involved in fermentation, cellular respiration, and photosynthesis (including orderly chemical transformations, the relevance of redox reactions, and electron/proton transport).
6. Describe the nature and function of enzymes and describe major mechanisms used to control their activity.
7. Explain the transfer and modification of heritable traits from parents to offspring.
8. Describe the nature and expression of heritable information at the molecular level, including DNA replication, DNA repair, transcription, protein synthesis.
9. Apply Mendelian genetics to solve monohybrid and dihybrid crosses.
10. Identify examples of exceptions to strict Mendelian genetics.
11. Explain how genetic expression is controlled in prokaryotes and eukaryotes.
12. Describe the cellular response to its environment (e.g. membrane transport, signal transduction).
13. Describe how the loss/failure of cellular control mechanisms can cause cancer.
14. Explain cellular reproduction, growth, and differentiation in the context of organismal development.
15. Describe characteristics of viruses and bacteria (e.g., life history genome type and content, exchange of genetic material).
16. Describe the experimental basis and select applications of recombinant DNA technology.
17. Describe the development and evaluation of scientific explanations of natural phenomena.
18. Apply biological concepts in the assessment of contemporary issues.

#### **GENERAL EDUCATION CURRICULUM GOALS & OBJECTIVES:**

This course fulfills the requirements for General Education: Natural Sciences: Biological Sciences. Courses in the Natural Sciences foster an understanding of the principles, theories and methods of modern science, the relationship between science and technology and the effects of science and technology on the environment.

#### **Learning Objectives:**

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students learn key events in the history of science.
3. Students provide examples of the inter-dependence of scientific and technological developments.
4. Students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

#### **How students meet the GEC objectives through this course:**

In Biology 1113, Biological Sciences majors meet the GEC Natural Science Learning Objectives in multiple ways. The course, in conjunction with Biology 1114, is an in-depth study of the laws, structures, and interrelationships within the biological universe. Students gain an understanding of the foundations of modern biology by studying cell structure and function, bioenergetics, genetics, and early animal development. In the laboratory activities, students not only reinforce the biological concepts introduced in lecture, but also learn scientific reasoning and methods. Through the study of the history and key discoveries in biology, Biology 1113 students learn the details of the interrelationship between technology and scientific methods in the modern investigative study of biology, and gain an appreciation of the social and philosophical ramifications of our knowledge of biology and biological discoveries.

**SCHEDULE:** \*Chapters in Campbell Biology textbook; #Mastering Biology Homework Due at 12:20pm (beginning of lecture); + New York Times Reading Due; ^Primary Literature Discussion

Week	Date	Lecture Topic	Chapter*	Honors Section	Lab
1	Aug 23	Introduction to BIO 1113	1	Group Icebreakers	1: Scientific Reporting
	Aug 25	Themes in Biology	1		
2	Aug 28	Water	3	Introduction to Peer-Led-Teaching Theory	2: Chemistry of Life: Molecules & Water
	Aug 30	Macromolecules	5		
	Sept 1#	Macromolecules	5		
3	Sept 4	<i>No class: Labor Day!</i>		Development of Peer-led Activity	+3: Chemistry of Life: Food Lab
	Sept 6	Macromolecules	5		
	Sept 8#	Metabolism	8		
4	Sept 11	<b>Exam 1</b>	<b>1, 3, 5</b>	<b>Primary Literature Discussion</b>	4: Enzymes
	Sept 13	Metabolism	8		
	Sept 15#	DNA Structure	16		
5	Sept 18	DNA Replication	16	Testing of Peer-led Activity (Groups 1 & 2)	+Intro to Scientific Inquiry
	Sept 20	DNA Replication	16		
	Sept 22#	Genes to Proteins	17		
6	Sept 25	<b>Exam 2</b>	<b>8, 16</b>	<b>Primary Literature Discussion</b>	<b>Topic &amp; References Due</b>
	Sept 27	Genes to Proteins	17		
	Sept 29 #	Gene Expression	18		
7	Oct 2	Gene Expression	18	Testing of Peer-led Activity (Groups 3 & 4)	<b>+Outline Due</b>
	Oct 4	Gene Expression	18		
	Oct 6#	Biotechnology	20		
8	Oct 9	<b>Exam 3</b>	<b>17-18</b>	<b>Field Trip</b>	<i>No lab – Fall Break</i>
	Oct 11	Genomic Evolution	21		
	Oct 13	<i>No class: Fall Break!</i>			
9	Oct 16	Viruses	19	<b>Field Trip Journal Due</b>	+5: Cell Lab
	Oct 18	Cell Structure	6		
	Oct 20	<b>Exam 4</b>	<b>19-21</b>		
10	Oct 23	Cell Structure	6	<b>Primary Literature Discussion</b>	<b>Draft 1 Due</b>
	Oct 25	Cell Membranes	7		
	Oct 27#	Cell Cycle	12		
11	Oct 30	<b>Exam 5</b>	<b>6-7</b>	Testing of Peer-led Activity (Groups 5 & 6)	+Group Work
	Nov 1	Cell Cycle	12		
	Nov 3#	Meiosis	13		
12	Nov 6	Meiosis	13	Testing of Peer-led Activity (Groups 7 & 8)	+6: Mendelian Genetics: Fly Lab Group Work
	Nov 8	<b>Exam 6</b>	<b>12-13</b>		
	Nov 10	<i>No class – Veteran's Day</i>			
13	Nov 13	Mendel & Genes	14	<b>Primary Literature Discussion</b>	<b>Final Research Proposal Due, Peer Review</b>
	Nov 15	Inheritance	15		
	Nov 17#	Inheritance	15		
14	Nov 20	<b>Exam 7</b>	<b>14-15</b>	No class - Thanksgiving	No labs – Thanksgiving
	Nov 22	<i>No class: Thanksgiving</i>			
	Nov 24	<i>No class: Thanksgiving</i>			
15	Nov 27	Cell Communication	11	<b>Primary Literature Discussion</b>	7: Photosynthesis & Respiration <b>Proposal Presentations</b>
	Nov 29	Cellular Respiration	9		
	Dec 1#	Cellular Respiration	9		
16	Dec 4	Photosynthesis	10	<b>Primary Literature Discussion</b>	No labs
	Dec 6	Photosynthesis	10		
17		<b>Final Exam:</b> Day/Time/Room TBA; 50 points from Chapters 9-11; 50 points cumulative (all Campbell Chapters we covered)			