



EFB 103 - GENERAL BIOLOGY II: CELL BIOLOGY AND GENETICS

Spring 2014

Professor: Dr. Christopher Whipps
Office: 133 Illick Hall
Scheduled office time: Tu/Th 9:30-10:30AM, and by appointment.
E-mail: cwhipps@esf.edu
Website: <http://www.esf.edu/efb/whipps/>
Phone: 315-470-4762
Course Resources: <http://blackboard.syr.edu/>
<http://www.masteringbio.com/>
<http://www.khanacademy.org/> (not required but likely incredibly useful)

Graduate Teaching Assistants: Funmi Afelumo (Last names starting with A-Ha)
Katrina Alger (Last names starting with He-Pa)
Gabrielle Fanfan (Last names starting with Pe-Z)
TA Office hours posted on Blackboard

Lecture Times: Tu/Th 8:00 – 9:20, Marshall Hall Auditorium
Co-Requisite: EFB104: General Biology II Laboratory.

Mandatory readings: Campbell Biology in Focus, 1st Ed. (2013) Reece et al. Pearson Education.
Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body (2009). Neil Shubin. Vintage.
On-Line Requirement: Mastering Biology (<http://www.masteringbio.com/>).

Major Concepts:

- The molecular basis of life; nature of elements and compounds and building blocks of biological molecules.
- Biology of the cell; structure and function, energy flow, metabolism, photosynthesis, cell division, cell signaling.
- Genetics; patterns of inheritance, DNA and gene structure, gene expression, genomics, development.
- Population genetics and speciation; gene frequency and distribution, evolution at population level, speciation, systematics.

EXPECTATIONS FOR EFB 103

Lecture Attendance: Students who do not attend all lectures will find themselves at a disadvantage and this will likely be reflected in the grade earned. Announcements about course changes are made during lectures, usually at the beginning. Lecture starts promptly at 8:00 am. If you come in late, you will potentially miss an announcement and an important lecture topic. If you do arrive late for reasons beyond your control make sure to come into the classroom discretely to minimize this disruption. Students are responsible for the consequences of missing these announcements.

Benefits of Attendance: Over the years I have found that students who regularly attend classes score approximately 10% higher, on average, than students that miss several classes. This is based on the average performance of numerous students and individual results may vary, but demonstrates that class attendance can have a dramatic impact on the grade many students are able to earn in EFB 103.

Classroom Etiquette: I expect you to come to class with the intention to learn and to create an environment conducive to learning for you and your classmates. This requires your undivided attention during the class. Items or activities that may distract your attention are thus to be avoided. These include cell phones, text messaging, instant messaging, email, etc. Switch off your cell phones before class. Anyone found using cell phones, or other similarly disruptive activities, will be asked to cease the activity and may be asked to leave the class.

Use Blackboard: Course resources, assignments, important announcements, teaching assistant office hours, etc. will be posted on Blackboard (<http://blackboard.syr.edu/>).

Regarding content, when I say something is ‘expected’ this is what I mean:

Self Test and Challenge Questions

You are expected to have completed the practice questions and challenge questions at the end of each chapter, and you *understand* the answers.

Vocabulary

You are responsible for the definitions of all boldfaced words in the sections of the text we cover. This means that you should be able to provide a brief definition upon request and be able to recognize the correct definition from a list of incorrect ones. You are also responsible for the technical terms defined in lecture.

Concepts

You are responsible for the major concepts outlined in lecture and those in the ‘Concept Check’ in each textbook section, and ‘Chapter Review’ at the end of each chapter. A concept may be an idea, hypothesis, process, or description. Concepts can be broad, like gene expression, or more focused, like the genetic code. Your responsibility for concepts is:

- 1) Be able to provide a definition of the concept.
- 2) Be able to provide an example of the concept, or recognize an unfamiliar example of the concept.
- 3) Be able to explain the significance of the concept – e.g., glycolysis is the process that provides the initial breakdown of carbohydrates for energy production.
- 4) For a process like the Krebs cycle, be able to explain how the process works, including inputs into the process, what happens to them, and what the outputs are.

GRADES AND REQUIREMENTS

| | |
|-------------------------------------|------|
| Exam 1 - February 11, 2014 (Week 5) | 15% |
| Exam 2 - March 4, 2014 (Week 8) | 15% |
| Exam 3 - April 8, 2014 (Week 13) | 15% |
| Exam 4 - Finals week | 20% |
| Assignments | 15% |
| Mastering Biology | 10% |
| In-class group activities | 10% |
| <hr/> TOTAL | 100% |

Exams (65%)

Each exam covers material from the chapters listed on the schedule. The final exam is 40-60% cumulative and 40-60% will cover the last quarter of the course. Lecture exams will typically have a one-three pages written section (short answer, fill in the blanks, etc.), possibly a few matching questions, and approximately 30-60 multiple choice questions (depends on the amount of material covered). The final exam will likely have more written answer questions and 50-80 multiple choice questions.

During the exam, the first 15 minutes are 'quiet time', meaning if you have a question please wait until 15 minutes has past to ask the instructor or TA. This provides *everyone* with at least 15 minutes of undisrupted time to start of the exam, which is particularly important in the large lecture hall. Make note of which question you don't understand and come back to it.

- Bring student ID or have your student number memorized to write on Scantron answer sheet.
- Bring a number 2 pencil.
- Note exam dates ahead of time and make semester travel plans accordingly, especially for the final exam. Be prepared to take the final exam on the day that it is scheduled.

Assignments (15%)

There will be semi-weekly assignments (approximately 8-11) supplementing the material presented in lecture or to highlight another topic from an assigned reading. These will also cover different material than the online activities carried out on Mastering Biology. Once the assignment is issued in lecture, it will also be available on Blackboard. Assignments are to be completed on paper and handed in as hard copies. E-mailed versions are not acceptable. Assignments are to be turned into your TA by the due date. See the policies regarding late assignments.

You are encouraged to work in groups or get help with assignments at help sessions or from tutors. However, the final product from each individual must be your own work (see academic integrity policies). The goal of the assignments is to learn something.

You are to include your name, student number, the date and your signature on ALL assignments.

Mastering Biology (10%)

For each Chapter in the book, there will be a corresponding Mastering Biology online assignment. These will complement the regular written assignments using sample questions and interactive tutorials. Each will be graded and your total score will be worth **10%** of the overall grade. These are meant to complement the written assignments with questions that can be asked using interactive media. Once an assignment is completed, it can be reworked after the due date.

Note that the first few MB assignments will not be due until the end of the second week. This will allow time to access the online system, complete the assignments and report any issues with the system. The remaining assignments will be due on or around the day of lecture. The goal of these assignments is to prepare for lectures and provide an interactive means by which to explore the material presented in class. Once an assignment is complete and the due date has passed, it can be reviewed for further study.

Group Activities in Class (10%)

Group projects will involve addressing questions or solving problems in groups of 5 in class. The goal is to set aside some additional time to explore selected topics through an additional short group assignment and class discussion. Group work will largely be graded on a contract basis (i.e., that the questions were answered / addressed by the group), although some responses will have a true correct answer or range of acceptable responses on which grading will be based. Technological devices are welcome for these activities (smart phones, laptops, tablets, etc.). Only members of the group present on a given day will receive points for a activity. Part of the overall group activity score for any particular student will also be determined by a confidential peer evaluation conducted toward the end of the semester. Points will be earned by completing the evaluations as well.

Other

Portfolio Bonus: If, at some time during the last weeks of the semester (before the final exam), you meet the minimum requirement and show me your complete set of work for this class, assembled according to instructions on Blackboard, you can earn up to 3% bonus to your overall grade for the semester. Detailed instructions for minimum standards and preparing your course portfolio will be provided on Blackboard.

Help Session Bonus: The usefulness of attending help sessions run by your TAs should be self evident. However, as an extra incentive to attend, you can earn a 1/5% (0.2%) bonus within any week you attend a

session, with a maximum of 2% overall bonus (*i.e.*, 10 help sessions). You are welcome to attend more than 1 session a week and 10 sessions overall.

MISSED ASSIGNMENTS OR TESTS

Assignments are expected to be turned in on time. Work turned in less than 24 hours late will receive a maximum of 50% credit. Late work will **not** be accepted and will be given a zero, 24 hours after the time it is due. Students prepared to provide documented proof that circumstances entirely beyond their control resulted in lateness may apply for an exemption to this rule. Examples are provided below.

Similarly, a missed exam will count as zero and make-up exams are only allowed in exceptional circumstances, like those described below. If you know that you will be unable to take a lecture exam contact the instructor or TA as soon as possible. The exam dates are listed in the schedule provided and will not change. In the case of an emergency that causes you to miss an exam, contact the instructor or TA as soon as the emergency is resolved. If you fail to make alternative arrangements in a timely manner, a make-up exam will not be allowed.

Late assignments and make-up exams will only be allowed if the student has documented proof of a valid excuse such as:

Illness – requires a note from SU Student Health Center (be sure to read SU note policy).

Hospitalization – requires a hospital or personal physician’s note.

Death in the Family – requires an Obituary or Mass card.

Traumatic personal issues – requires ESF Student Life notification to course instructors.

GRADING SCHEME

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 = 60% - 69%, F = 59% or less

AMOUNT OF STUDY

A good rule of thumb for introductory college courses is *2 hours of study for each hour of lecture*. Thus, a student with an average college reading ability will need to spend approximately 6 hours a week outside of class reading, reviewing lecture notes, and working through practice problems. Reading the text will likely only be a small part of your studying. Most of your time will be dedicated to rewriting notes, challenging yourself with practice problems, and end of chapter questions. Mastering Biology tutorials and activities will also contribute to your study time. Form study groups and help each other. I do not grade on a curve, so you are not in competition with each other for grades. The grade you earn is the one you deserve, so it only benefits you to help and learn from each other.

*“We Learn . . .
10% of what we read
20% of what we hear
30% of what we see
50% of what we see and hear
70% of what we discuss
80% of what we experience
95% of what we teach others.”
-William Glasser*

Helpful study tips and information on tutoring is available from the Academic Success Center.

<http://www.esf.edu/students/success/>

EFB 103 TA Help Sessions: There will be weekly optional help sessions organized by lecture Teaching Assistants. Attendance is not required but gives you an opportunity to ask questions about the material in lecture or get clarification on an end of chapter question. There will be a sign-in sheet at help sessions. Make sure to print your name and write your signature on this sheet.

Other Study Resources at ESF: Having some struggles with the course material? Maybe a tutor could help! If you are an undergraduate student and believe you could benefit with the help of a tutor, stop by the Academic Success Center in 109 Moon to sign up or visit us online at <http://www.esf.edu/tutoring/>.

Also, during the semester the ASC will be holding periodic workshops on Time Management Development, Study Skills & Lecture Preparedness, Avoiding Plagiarism, and Finals Preparation tips. A schedule of dates and times are available in the ASC, stop by for more information.

FEEDBACK FROM YOU

Much like the systems we study as scientists, EFB103 is dynamic and evolving, experimenting with educational approaches and procedures. Some of these approaches may work for you and others may not, so I want to hear from *you*! In addition to the ESF administered survey, I will also administer an end-of-course survey on Blackboard that focuses on specific parts of the course.

UNIVERSITY AND DEPARTMENTAL POLICIES

Support for Students With Learning And Physical Disabilities: SUNY-ESF works with the Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations. Students can contact ODS at 804 University Avenue- Room 309, 315-443-4498 to schedule an appointment and discuss their needs and the process for requesting accommodations. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall, 315-470-6660 for assistance with the process. To learn more about ODS, visit <http://disabilityservices.syr.edu>. Authorized accommodation forms must be in the instructor's possession one week prior to any anticipated accommodation. Because accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Academic Dishonesty: Academic dishonesty is a breach of trust between a student, one's fellow students, or the instructor(s). By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct (<http://www.esf.edu/students/handbook/StudentHB.05.pdf>), in particular academic dishonesty includes but is not limited to plagiarism and cheating, and other forms of academic misconduct. The Academic Integrity Handbook contains further information and guidance (<http://www.esf.edu/students/integrity/>). Infractions of the academic integrity code may lead to academic penalties as per the ESF Grading Policy (<http://www.esf.edu/provost/policies/documents/GradingPolicy.11.12.2013.pdf>).

Student responsibilities relative to the educational experience

-Demonstrate Academic Honesty: Students must avoid dishonest practice, including plagiarism and cheating, and other forms of academic misconduct.

-Know Policies and Expectations: It is each student's responsibility to be familiar with College regulations and to abide by them (www.esf.edu/students/handbook or in hard copy in 110 Bray Hall)

-Report Academic Integrity Violations: Dishonest actions, by even one individual, erode the very foundation of ESF's integrity as an institution. All members of the ESF community must take action when the College's collective honor is threatened or compromised. Violations of academic integrity can be reported directly to instructors or to any member of the Student Life staff.

"The foundation of scholarship in all academic disciplines is honesty. At ESF, it is expected that you will pursue your educational aspirations with passion and integrity, honestly completing each assignment, every problem, and all exams and papers."

TENTATIVE LECTURE SCHEDULE

The following is a list of topics and readings that will be covered throughout the semester. Note that the exact topics and timing of their presentation may vary.

Exam dates are firm and will not change, so plan accordingly.

You are responsible for reading the assigned chapters BEFORE coming to lecture.

| WEEK | Lecture | Date | General Topics | Textbook chapter | Inner Fish chapter | Assignments | EFB104 Lab |
|------|---------|--------|--------------------------------------|-------------------------------------------------|---------------------------|---------------------|-----------------------|
| 1 | 1 | 14-Jan | Intro, Unifying Concepts | Chapter 1: Themes in the Study of Life | 1&2: Inner Fish | #1 (Who are you) | Biochemicals I |
| | 2 | 16-Jan | Elements, bonds, water | Chapter 2: Chemistry of Life & Water | and homology | | |
| 2 | 3 | 21-Jan | Macromolecules | Chapter 3: Carbon & Biomolecules | | #2 (Molecules) | Biochemicals II |
| | 4 | 23-Jan | Membranes | Chapter 3&5: Lipids & Membranes | | | |
| 3 | 5 | 28-Jan | Transport and Signaling | Chapter 5: Membrane transport & Cell Signaling | 8 & 10: Scents and Ears | | Membrane Structure/Fn |
| | 6 | 30-Jan | Organelles, Prok.'s & Eukaryotes | Chapter 4: A Tour of the Cell | | | |
| 4 | 7 | 4-Feb | ATP, Enzymes, pathways | Chapter 6: An Intro to Metabolism | | #3 (Cell structure) | Enzymes |
| | 8 | 6-Feb | Respiration | Chapter 7: Cell Respiration and Fermentation | | | |
| 5 | 9 | 11-Feb | EXAM 1 (Ch 1-6) | | | | Photosynthesis |
| | 10 | 13-Feb | Respiration | Chapter 7: Cell Respiration and Fermentation | | | |
| 6 | 11 | 18-Feb | Light equals energy | Chapter 8 Photosynthesis | | #4 (Energy) | Respi/Photosynth |
| | 12 | 20-Feb | Energy systems | Chapter 9: The Cell Cycle | | | |
| 7 | 13 | 25-Feb | Cell Division, mitosis | Chapter 10: Meiosis and Sexual Life Cycles | | #5 (Division) | Cell division |
| | 14 | 27-Feb | Haploid/Diploid, meiosis | Chapter 11: Mendel and the Gene Idea | | | |
| 8 | 15 | 4-Mar | EXAM 2 (Ch 7-10) | | | | Data Analysis |
| | 16 | 6-Mar | Sex Determination, mtDNA | Chapter 12: Chromosomal Basis of Inheritance | | | |
| 9 | ~~~~~ | ~~~~~ | SPRING BREAK!!! | ~~~~~ | ~~~~~ | | |
| 10 | 17 | 18-Mar | DNA Structure, replication | Chapter 13: The Molecular Basis of Inheritance | 11: The Meaning of it all | #6 (Mendelian) | Open- TBA |
| | 18 | 20-Mar | Genetic Code, expression | Chapter 14: From Gene to Protein | | | |
| 11 | 19 | 25-Mar | Expression, translation | Chapter 14: (continued - translation) | | #7 (Expression) | Lab Practical |
| | 20 | 27-Mar | Translation, mutation | Chapter 14: (continued - TLN, mutation) | | | |
| 12 | 21 | 1-Apr | Lac operon, degradation | Chapter 15: Regulation of Gene Expression | | #8 (Control) | DNA electrophoresis |
| | 22 | 3-Apr | Genetic Engineering, PCR | Chapter 13 (p261-265): Biotechnology & Vaccines | | | |
| 13 | 23 | 8-Apr | EXAM 3 (Ch 11-15) | | | | Genetic Engineering |
| | 24 | 10-Apr | Natural Selection | Chapter 19: Descent with Modification | | | |
| 14 | 25 | 15-Apr | Fossil Evidence and Anatomy | Chapter 19 (continued) | 5: Getting Ahead | #9 (Pop. Gen.) | Population Genetics |
| | 26 | 17-Apr | Allele frequencies, agents of change | Chapter 21: The Evolution of Populations | 1&2: Reprise | | |
| 15 | 27 | 22-Apr | Species Concepts, geography | Chapter 22: The Origin of Species | | #10 (Selection/Sp.) | Lab Practical |
| | 28 | 24-Apr | Species clusters | Chapter 23: Broad Patterns | | | |
| 16 | 29 | 29-Apr | Last Day Review | | | | |

EXAM 4 During Final Exam Period (40-60% Part IV; 40-60% cumulative)

May 1-7