

<p style="text-align: center;">Biology 141Q – Cell Biology and Genetics Course Syllabus Fall 2014</p>
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Office Hours: W: 1:30-2:30 PM or by appointment
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Lecture: MWF 12-1:05 PM, Room 102, Pierce Hall

Laboratory: Monday 2:00-5:00PM, Room 125, Pierce Hall

Required Texts: (1) *Campbell Biology*, Reece et al, 2014, 10th edition, Benjamin/Cummings Publishing Co., Inc. (2) *Practicing Biology*, Heitz, Jean and C. Griffen. Benjamin/Cummings Publishing Co., Inc. 2014. A terrific workbook that is useful alone or in study groups.

Required Lab Text: SYMBIOSIS. *Investigating Biology*, 8th ed. Morgan, J. G. and M. E. B. Carter. Benjamin/Cummings Publishing Company, Inc. 2014. This **customized edition** published for BIO 141 is only available in the bookstore. *Used lab manuals or other versions are not permitted.*

Optional Writing Book: *A Student Handbook for Writing in Biology*, Karen Knisely, 2013, 4th edition, W.H. Freeman and Co. This is a great resource for writing, and is also on reserve in the library.

Web Site: www.masteringbio.com. Mastering Biology provides online study materials. Your text has instructions for accessing the site.

Course Objectives: The purpose of this course is to give you, the student, a firm foundation in the underlying themes of biology. To study living organisms, the knowledge of cell structure and function, genetics and evolution is vital. You will first develop an understanding of the chemical molecules that make up the structure of a cell and how these molecules govern cell function. Secondly, this course will help you comprehend crucial tasks conducted by cells; particularly how cells transport components across membranes, and how energy is generated within cells. Thirdly, you will learn the basic mechanisms of cell duplication, inheritance of biological traits and processing of genetic information. You will also become familiar with the study of gene transmission within a population and how genes are responsible for the evolution of organisms. A fourth objective of this course is for you to use your knowledge of cellular mechanisms towards understanding the concepts of evolution and diversity in the biological world. Finally, a very important objective of this course is teaching you to “think and act like a scientist” through methods of scientific inquiry and the practice of deductive reasoning. Both lecture and laboratory are designed to accomplish the above goals. Upon grasping these fundamental themes of biology, you will be prepared to further probe into more intricate and specialized areas of this field.

NOTE: This syllabus, particularly the schedule, is subject to change. You will be notified of any changes in the classroom and/or via Blackboard (BB). It is your responsibility to note the changes.

Biology 141 – Cell Biology and Genetics
Lecture Schedule Fall 2014

Date	Topic	Assigned Reading
W , Aug 27	Science as a Way of Knowing	Chapter 1
F 29	Major themes in Biology	Chapter 1
M Sept 1	**Labor Day** no class or lab	
W 3	Hierarchies: Chemistry and water	Chapters 2,3
F 5	Carbohydrates and lipids	Chapters 4, 5
M Sept 8	Proteins and nucleic acids	Chapter 5
Tu 9	<i>Scientific Literature & Research - Library - Required</i> (8:00 – 8:45am and 9:00 – 9:45am)	
W 10	Structure and function revealed in cells	Chapter 6
F 12	Cell biology - Problems/Case Study	
M Sept 15	Membrane structure and cellular transport	Chapter 7
W 17	Transport problems	
Th 18	<i>Effective Presentation of Scientific Data – P206 bring your data</i> (8-8:45 and 9-9:45)	
F 19	Energy transformations: enzymes, ATP and electron carriers	Chapter 8
M Sept 22	Cellular respiration I - Glycolysis <i>Respiration lab proposal due in class</i>	Chapter 9
W 24	Cellular respiration II - Transition and the Krebs Cycle	Chapter 9
Th, Sept 25	EXAM I 8:00 - 9:30 a.m. (through membrane transport)	
F 26	Cellular respiration III – Chemiosmosis and ETS	Chapter 9
M Sept 29	Review and recapitulation: Accounting Day	Chapter 10
W Oct. 1	Homage to photosynthesis	
F 3	Photosynthesis I: the light dependent reactions	Chapter 10
M Oct 6	Photosynthesis II: Light independent reactions	Chapter 10
W 8	<i>Development of Team Research Proposal (bring your laptop to class)</i>	
F 10	Cell reproduction: cell cycle, mitosis <i>Research proposals due to Blackboard by 3 p.m.</i>	Chapter 12
M Oct 13	**FALL BREAK** no class or lab	
W 15	Sexual life cycles and meiosis	Chapter 13
Th, Oct 16	EXAM II – 8:00 – 9:30 a.m. (through photosynthesis)	
F 17	Chromosomal mutations	Chapter 15 pp. 304-307

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Date	Topic	Assigned Reading
M Oct 20	Mendelian principles	
	genes and chromosomes	Chapter 14; 15 pp. 291-304
W 22	Patterns of inheritance	Chapter 14; 15 pp. 291-304
F 24	Chromosomal theory and linkage	Chapter 15
M Oct 27	Genetics problems and review	Chapter 14; 15
W 29	DNA structure	Chapter 16
Th 30	<i>Effective Presentations Workshop - 8:00 – 8:45, 9:00 – 9:45 a.m. - Pierce 206 (optional)</i>	
F 31	DNA replication	Chapter 16
M Nov 3	Gene to Protein I: Transcription	Chapter 17
W 5	Gene to Protein II: Translation and mutations	Chapter 17
F 7	Molecular genetics workshop	
M Nov 10	Charles Darwin and evolutionary concepts	Chapter 22
W 12	Evidence for evolution	Chapter 22, 25 pp. 522-527; 531-538
Th, Nov 13	EXAM III - 8:00 – 9:30 a.m. (through genetics)	
F 14	Population Genetics and Hardy Weinberg	Chapter 23
	<i>Scientific Papers – “Ask THE EDITORS” 2:30-3:30 PM P101</i>	
M Nov 17	Microevolution: drift, gene flow and mutation	Chapter 23
W 19	Genetic variation and selection	Chapter 23
F 21	Speciation	Chapter 24, pp. 500-510
	<i>Research papers due in class</i>	
M Nov 24	Evolution of land plants	Chapter 29
W 26	**THANKSGIVING BREAK **	
F 28	**THANKSGIVING BREAK **	
M, Dec 1	Sexual Encounters of the Floral Kind	Chapter 38 pp. 815-821
W 3	Bryophytes and seedless vascular plants	Chapter 29
F 5	Seed plants: gymnosperms and angiosperms	Chapter 30
M 8	Evolutionary trends in land plants & Big Themes Revisited	
Th, Dec 11	FINAL EXAMINATION 2-5PM	<i>(evolution through plants + comprehensive)</i>

BIOLOGY 141 LABORATORY SCHEDULE

Fall 2014

Dr. Nitya Jacob

***Writing assignments are due one week later at the beginning of the lab period.**

+These assignments are not turned in for a grade.

<u>Date</u>	<u>Lab Topic (#)</u>	<u>Writing Assignment*</u>
Sept. 5	Scientific Investigation <i>Monday lab meets on FRIDAY this week ONLY</i>	<i>Title page; Introduction; References (due 9/15 in lab)</i>
8	Microscopes and Cells	Review table ⁺
15	Diffusion and Osmosis	<i>Title Page; Materials and Methods</i>
22	Enzymes	<i>Results & Discussion; Table; Figure; References (due 10/6 in lab)</i>
29	Cellular Respiration and Fermentation	<i>Proposal (due 9/22 in class)</i>
Oct. 2 nd	(Thur.) LAB EXAM I (thru Enzymes) (Sign up for exams at 6:00 p.m. or 6:30 p.m.)	
6	Mitosis and Meiosis <i>Research Proposals submitted to Blackboard ON FRIDAY, Oct. 10th by 3 p.m.</i>	Comparison Table ⁺
13	**FALL BREAK**	
20	Field Research: Ecology and Evolution on the Outcrops	
Oct. 23 rd	(Thur.) LAB EXAM II (Respiration, Mitosis & Meiosis) (6:00 p.m. or 6:30 p.m.)	
27	Microbial Diversity (Bacteriology)	<i>Research papers due in class 11/21</i>
Nov. 3	Research Symposium <i>(Technology Rehearsal -2:30 Pierce 101)</i>	
10	Molecular Biology	Map ⁺
17	Plant Diversity I & II	Comparison Tables ⁺
24	**No Lab this week due to THANKSGIVING BREAK **	
Dec. 1	Bioinformatics: Molecular Phylogeny of Plants	<i>Report due in lab</i>
Dec. 4 th (Thurs.)	LAB EXAM (Molecular Biology and Plant Diversity I & II) (6:00 p.m. or 6:30 p.m.)	

Important Dates for Biology 141 (includes lab and out of class sessions)

September:

- 9 *Scientific Literature workshop (required) meet in the Library*
- 1 Title page, Introduction; References due in lab
- 18 *Effective data presentation workshop – bring your data P206*
- 22 Title page, Materials and Methods due in lab
- 22 Respiration research proposal due at 9AM on BB
- 25 **Exam I**

October:

- 2 **Lab Exam I**
- 6 Results & Discussion; Figure, Table & References due in lab
- 8 Research Development Proposal – identify your team; bring laptop to class
- 10 Laboratory research project proposals due on Blackboard by 3 p.m.
- 16 **Exam II**
- 23 **Lab Exam II**
- 30 *Effective presentations workshop (2 group members must attend)*

November:

- 3 Research symposium (*Technology Rehearsal at 2:30*)
- 13 **Exam III**
- 14 *“Ask the Experts” session*
- 21 **Research paper due in class**

December:

- 1 Molecular phylogeny report completed in lab
- 4 **Lab Exam III**
- 11 **Final Exam, 2-5pm**

EXPECTATIONS, EVALUATION AND TIPS FOR SUCCESS IN BIOLOGY 141

Welcome to Biology 141! Please read carefully and follow the information in this handout and any accompanying materials. You are responsible for understanding all of the information presented here, so please ask questions if needed. Please pay attention to any changes to the syllabus as some information may be subject to change during the semester.

Biology 141 is designed for students who **plan to major in biology, attend professional school in a health related field, or have a strong background in biology** and have chosen biology to fulfill their distribution requirements. This may be one of the more difficult courses you will take. The course demands that you learn detailed and complicated information, organize this information within the major concepts of biology, and apply your knowledge. In addition, there are multiple exams and assignments associated with this course. Your competence in basic biology will be assumed in other Biology courses, therefore it is crucial for you to succeed in this course. Many of you will be taking

examinations to enter graduate or professional schools, and the knowledge you will gain in this course will be required for these tests.

Ways of Inquiry (INQ): Biology 142 is designated as a “Ways of Inquiry” or INQ course. In INQ courses, students “understand and question the way knowledge is sought by actively learning and practicing the discipline’s approaches to inquiry” (INQ Vision Statement). In other words, you will learn about genetics in this course not just by learning information simply “given” to you. You will learn about the subject by practicing methods that led to the discovery of that knowledge in the first place - by asking questions, designing experiments, reading and writing critically, working independently, making connections, and thinking beyond the confines of the discipline.

Tips for Success: Biology 141 is an intensive course and requires time. To perform well in this course, you must manage your time appropriately. You must have a proper study plan, beginning from the first day of class. The following are some good study habits that will help you succeed in Biology 141:

- * **Keep up with assigned readings.** The readings listed against each lecture in the syllabus must be done BEFORE the lecture.
- * **Take good notes.** In lecture, I will explain the most significant concepts from your readings. At times I will present examples that may not be given in your textbook. You are responsible for all of this information. Ask questions in class to help you connect with the concepts. Review your notes after every lecture and before the next class.
- * **Connect the lecture notes to your readings.** For the test, you are responsible for information in the textbook as well as the lecture notes. Make sure that you are able to grasp the major concepts thoroughly and in detail. In addition, connect the concepts learned in lecture to the lab exercises.
- * **Review material on a regular basis.** Study the diagrams in your text and lecture handouts. Practice writing out pathways and linking concepts. Use the blank figures handed out in class for your study. Attend your SI sessions on a regular basis. Take advantage of my office hours to get individual direction.
- * **Keep two things in mind.** One - learn terminology and most importantly, understand the relevance of that terminology to biological function. Second - this course is designed to make you think and not just to have you memorize facts. Memorizing facts is important to establish a basis for your knowledge but it is not sufficient. You must be able to use your knowledge to think logically and analytically. Many of the test questions will revolve around applying your knowledge. Therefore you should be confident of what you know and what it means.

- * **Lab is equally important.** The laboratory component of this course is intensive and requires time as well. Please read your lab manual BEFORE lab and pay attention to the details. Take good notes during the lab and take time to make detailed observations. Answer questions in the lab manual either during lab or immediately following lab. Pay attention to information about lab exams. Make use of open lab time. Learn to manage your time well and prepare in advance for the lab writing assignments.

Supplemental Instruction (SI) is provided for all students in Biology 141. I will explain this important program that provides assistance for students who wish to improve their performance in biology. Your Biology 141 SI leader this semester is **Nolan Graham**.

Honor Code: All examinations and all work for credit in this course come under the regulations of the Honor Code. Your signature on your work attests to your upholding the Honor Code. Please read the information on **plagiarism** on the Library web page and always ask if you have any questions about assignments. Note that writing assignments will be submitted to **SafeAssign on Blackboard**. Please follow the Honor Code in ALL aspects of this course and include your signature on your work as your pledge.

Exam Protocols: Do not come to any exam with notecards in your pockets or on your person. All cell phones are to be turned off and either in your bag in the front of the room or on the instructor's bench. Do not write notes or study material, or anything that could be construed as these, on your body. Check for such notations and remove before the exam time. These are considered to be a breach of the Honor Code.

Absences: The policy on absences is provided in a separate handout. Unexcused absences, tardiness, or a failure to follow the procedures outlined in that handout can result in a reduction in your grade. It is your responsibility to clearly communicate with the instructor as much in advance as possible about medical or family emergencies.

Cell Phones: The use of cell phones is strictly prohibited in the classroom and the laboratory. Please turn off your phone before you come to class and leave your phone at the front during exams. *Photography with camera phones is also prohibited in lab and lecture.*

Personal Computer or Tablet: If you would like to take notes on your personal laptop or tablet in class you must first seek special permission from the instructor. Surfing the web, Facebook, Skype or other multitasking/networking/chat during class is completely unacceptable and will not be tolerated.

College-Wide Assessment: Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.

Office Hours: I would like to encourage you to meet with me in person about any concerns or questions that may arise during the semester. I have scheduled specific office hours but if these times are not suitable for you, please do not hesitate to make an appointment with me for a different time.

Blackboard Site: A Blackboard site is set up for this course to access course resources and to submit assignments.

Additional Sessions: We have two required additional instruction sessions in this course for library and effective data presentation. These sessions are held outside of class time and are critical for your laboratory assignments.

Evaluation Criteria:

- ✧ *Examinations* – There will be three lecture exams, each worth 100 points, including multiple choice, short answer and short essay questions. Exams will cover all material in lecture in addition to assigned textbook readings and other supplemental materials. Use the knowledge you gain in lab to help with understanding the lecture material. The final examination, worth 175 points, is comprehensive. Three laboratory exams, each worth 50 points, will be given in this course. Each lab exams will cover the material from the lab exercises. The lab exams will include a practical and a written portion.
- ✧ *Scientific Writing and Laboratory Project* - You will write individual sections of a scientific paper for specific laboratory exercises. The lab also involves a group independent investigation as a research project. For this laboratory, you will prepare a group symposium presentation and write an individual complete scientific paper. Specific instructions will be provided in lab.

Evaluation Points: Students are evaluated on their performance in the classroom and the laboratory. The following is the distribution of points:

300 points	3 lecture exams	Final grade determination: 90 – 100% A 80 – 89% B 70 – 79% C 60 – 69% D <60 F Plus and minus grades are given
135 points	3 laboratory exams	
175 points	final examination	
35 points	scientific writing	
75 points	lab project	
720 points	total	

The instructor reserves the right to adjust dates and topics on lecture and lab syllabi if she determines it is necessary.