Biology 155 – Applications and Communications in the Biological Sciences
Course Syllabus
Spring 2010

Faculty Information: Dr. Nitya Jacob, *Office*: Room 104, Pierce Hall; *Phone*: 770-784-8346
Office Hours: Mondays: 1-2 pm or by appointment
Email: Learnlink or njacob@emory.edu

Lecture: TTh, 10:00-11:15 AM, Room 102, Pierce Hall
Laboratory: Wednesday, 2:00-5:00 PM, Room 123, Pierce Hall

Required Books: Consult the lecture schedule for assigned pages for reading.

1) *The Canon: A Whirligig Tour of the Beautiful Basics of Science* by Natalie Angier. Houghton Mifflin Company, New York.

2) *Life As It Is: Biology for the Public Sphere* by William Loomis. University of California Press, Berkeley.

Additional Readings: In addition to the required books, other readings will be assigned to you through the course of the semester. Copies (or web links) of the readings will be available on the course Blackboard site (classes.emory.edu) at the time of each assignment.

Readings for Laboratory: To prepare for the laboratory, you are required to read a laboratory handout each week prior to the lab period. Handouts will be provided on the Blackboard site. Please bring the handouts to lab in a 3-ring binder.

Course Objectives: The purpose of this course is to introduce you to the world of biology, particularly topics that are pertinent to human life and society such as mutations, disease, the human genome, stem cells, gene therapy, evolution, and the environment. These topics are often in the news and are of significant public interest. Typically these topics are conveyed to the general public in newspapers, magazines, online publications, documentaries, and on the radio. Through this course, you will examine the scientific principles underlying these topics to understand them from both scientist and non-scientist perspectives. You will also develop an understanding of how scientific information is communicated by reading and writing a variety of pieces. In the laboratory you will gain hands-on experience with actual types of experiments that are conducted in the fields that we will cover this semester. This course fulfills the general education requirement for a laboratory science and the sophomore writing requirement. This course does not fulfill any requirements towards biology or other science major.

NOTE: *This syllabus, particularly the schedule, may be changed at any time with some advanced notice. You will be notified of any changes in the classroom, through email, or through the Blackboard site. It is your responsibility to pay close attention to any changes.*

Biology 155 – Applications and Communications in the Biological Sciences
Lecture and Laboratory Schedule Spring 2010
You are expected to complete the assigned readings PRIOR to the class period for which the reading is assigned. "Additional reading" and "Handout" refer to readings outside the required texts and will be available on Blackboard ahead of time.

Date	Topic	Assigned Reading
Th, Jan 14	Science and Biology	
T, Jan 19	Scientific thinking	Angier: pp. 1-46;
	Life and living organisms	Loomis: Preface, pp. 1-26
	Assignment due: short essay on science	
W, Jan 20	*Laboratory 1 - Thinking Scientifically*	*Handout*
Th, Jan 21	Cells and Molecules	
T, Jan 26	Molecules and the whole organism	Angier: pp. 183-211
W, Jan 27	*Laboratory 2 – Cells and molecules*	*Handout*
Th, Jan 28	Mutation, variation, and disease	Review Loomis: pp. 1-26
	Assignment due: summary of a scientific paper	
T, Feb 2	The human genome	Loomis: pp. 81-102
W, Feb 3	*Laboratory 3 – The human genome I*	*Handout*
Th, Feb 4	Film: The Human Genome	Additional reading
	Assignment due: preliminary topic selection for oral presentation	
T, Feb 9	How organisms develop	Loomis: pp. 27-49
W, Feb 10	*Laboratory 4 – The human genome II*	*Handout*
Th, Feb 11	**EXAM 1 (covers topics from Jan 14-Feb 9)**	
T, Feb 16	Introduction to stem cells	Review Loomis: pp. 27-49
	Assignment due: scientific paper draft (lab 4 and 5)	
W, Feb 17	*Laboratory 5 – Field trip: Stem cell research lab*	*Handout*
	Assignment due: questions for stem cell research lab visit	
Th, Feb 18	Stem cell applications	Additional reading
T, Feb 23	Stem Cell Debate	
W. Feb 24	*Laboratory 6 – Genetic engineering*	*Handout*
Th, Feb 25	Engineering Life	Loomis: pp. 51-79
	Assignment due: news article on stem cells for general public	

Biology 155 – Applications and Communications in the Biological Sciences
Lecture and Laboratory Schedule Spring 2010 Continued

Date	Topic	Assigned Reading
T, Mar 2	Gene Therapy	Additional reading
W, Mar 3	**Laboratory Exam 1 (covers topics from Jan 20-Feb 24)**	
Th, Mar 4	Film: Pandora's Box	Additional reading
	Assignment due: scientific paper final (labs 4 and 5)	
T, Mar 9, Th, Mar 11th	****Spring Break****	
T, Mar 16	Genetic Modification, Enhancement	Additional reading
W, Mar 17	*Laboratory 7 - Biodiversity of organisms*	*Handout*
	Assignment due: Presentation topic and bibliography	
Th, Mar 18	Darwin and the Origin of Species	Loomis: pp. 181-205
T, Mar 23	Evolution and Evidence	Angier: pp. 147-182
W, Mar 24	*Laboratory 8 – Understanding evolution*	*Handout*
Th, Mar 25	The Importance of Conservation	Additional reading
T, Mar 30	Sustaining life and the Environment	Loomis: pp. 207-230 Additional reading
	Assignment due: Essay on evolution for scientific audience	
W, Mar 31	*Laboratory 9 – Field Trip: Atlanta Botanical Garden*	
Th, Apr 1	The human brain	Loomis: pp. 119-149
T, Apr 6	**EXAM 2 – (covers topics from Feb 23-April 1)**	
W, Apr 7	*Laboratory 10 – The human brain and nervous system*	
Th, Apr 8	Pharmaceuticals: Expense	Additional reading
T, Apr 13	Pharmaceuticals: Benefit/Disadvantage	Additional reading
W, Apr 14	**Laboratory Exam 2 (covers topics from Mar 17-Apr 7)**	
Th, Apr 15	Politics and ethics	Additional reading
T, Apr 20	Student Oral Presentations	
W, Apr 21	*Laboratory 11 - Pharmaceuticals*	
Th, Apr 22	Student Oral Presentations	
T, Apr 27	The Elimination of Scientific Misconceptions	

****FINAL EXAMINATION** Thursday, April 29, 9:00AM-12:00PM**

GUIDE TO BIOLOGY 155

Please read this syllabus carefully and please be sure that you understand it very well. Continue to refer to it regularly through the semester. I will expect that you have read it thoroughly.

Expectations/ Tips for Success:

- **Take good notes in class!** Good note-taking will be very important for your learning process and for your performance on tests. Much of the fundamental scientific knowledge you are expected to know will be covered in class.
- **Be fully engaged and participate.** It is important to be an active participant in course work and discussion. This course requires you to engage in discussions and make valuable intellectual contributions which will be important to your success.
- **Complete all readings regularly.** You must complete the readings PRIOR to the class and laboratory period. Take good notes from your readings and be ready to contribute your knowledge or questions in the classroom.
- **Keep track of deadlines and assignments.** There are two lecture exams, two laboratory exams, readings, and multiple writing assignments. Prepare a time table of deadlines and assignments and be well organized.
- **Communicate clearly.** Please be sure to communicate clearly in the classroom and with the instructor. If you have any concerns or problems during the semester, please make an effort to keep me informed in advance.

Laboratory. There is no published lab manual for this course. Handouts describing each lab exercise will be available a week in advance on the Blackboard site specifically designed for the course. Please print out the laboratory readings and keep these handouts in a 3-ring binder so that they are easily available for lab. You are expected to read each exercise thoroughly and be fully prepared for each lab. NOTE: Your attendance in laboratory is REQUIRED (see absence policy). There are certain safety guidelines to follow in the laboratory – please refer to the sheet attached at the end of the syllabus BEFORE you come to the lab.

Attendance: The Biology department has a set absence policy – please see the attached handout. Absences can result in a grade penalty so please be fully aware of the policy.

Honor Code: All of your work in this course comes under the regulations of the Honor Code. Please follow the Honor Code and include your signature on your work as your pledge. I will pay close attention to writing assignments to detect plagiarism.

Writing Assignments: This is a writing course and there are multiple writing assignments. Please consult the syllabus to note when each assignment is due. If you

are expected to follow any specific guidelines for a particular assignment, it will be explained to you prior to the due date.

Oral Presentation: In the last week of the semester, the class period is devoted to student presentations. You will work in pairs – choose your presentation partner early in the semester. Together with your partner, pick one drug that is currently used in the market for your research topic. After conducting thorough research on this drug, you and your partner will present the information to the classroom in a 10-12 minute presentation. You will be expected to use Powerpoint slides for your presentation. In addition you must prepare an educational product such as a brochure, bookmark, small booklet, etc that is suitable for your target audience. You will receive further guidance on this project early in the semester.

Special Guest: We have a special guest in our course this semester, Ms. Jennifer Johnston, HHMI Curriculum Fellow and graduate student in Pharmacology at Emory University who will participate in class and lend her expertise on certain topics.

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 and using calculators on phones is also prohibited.

Evaluation Points:

Lecture exams (2)	200 points
Laboratory exams (2)	100 points
Short essay , stem cells questions	15 points
Class discussions	20 points
Scientific paper summary	10 points
Stem cell debate	15 points
Stem cell news article	20 points
Scientific paper	20 points
Presentation topic and bibliography	10 points
Essay on evolution	20 points
Oral presentation and product	25 points
Final exam	150 points

Total points: 580 points

Final grade determination *(Plus and minus grades are given)*

90 - 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
<60	F