BIO 10100
Foundations of Biology I
Fall 2014

Instructor: Fardad Firooznia, Ph.D.
Office: Marshak J-517
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E-mail: fffirooznia@ccny.cuny.edu

Office Hours:
Tue and Wed 12-2 pm, and by appointment.

Readings:
- Chapters in the following textbook: Biology: The Dynamic Science, 3rd Edition by Russell, Hertz, and McMillan, with MindTap, ISBN 9781305430358, Course Key: MTPQ-368P-PHSZ. Note: this is the same textbook you will use in Bio 10200.
- Some additional course readings on Blackboard.
- Lab instructions and some additional course readings in the Course Supplement.

Course description and goals:
This introductory course is the first of the core courses in the biology curriculum as a foundation for upper level courses in the major. The course emphasizes primarily the cell and molecular levels of organization. The course guides students in fundamentals of critical thinking and technical skills that are essential for mastering the content areas and being successful in upper-level courses. These include: critical thinking, collaborative learning, vocabulary skills, microscopy, collection and handling of scientific data, and elements of scientific investigation, especially experimental design. Throughout the course we will
- Present key experiments underlying major findings in Biology.
- Analyze experiments to identify what questions are asked, what hypotheses are tested, what elements are included in an experimental design, what predictions are made based on the hypotheses and the experimental design, and whether the data match the predictions and support the hypotheses.
- Familiarize students with graphical representation of data in Biology, use of math for measurements and data analysis, and use of drawing for illustrating biological ideas.
- Introduce natural selection and evolution as fundamental concepts in Biology.

At the end of the course students should be able to:
1. Formulate an hypothesis and design a controlled experiment to answer a scientific question.
2. Compare and contrast the basic structure of prokaryotic and eukaryotic cells and discuss their evolutionary relationship.
3. Recognize the basic structure and function of biological molecules and describe how they relate to cell structure and function.
4. Describe the basic structure and function of enzymes.
5. List the basic signal transduction pathways and mechanisms for cell-to-cell communication.
6. Describe the basic structure of cell membranes and the function of biological membranes in the control of transport.
7. Compare and contrast photosynthesis and aerobic and anaerobic respiration.
8. Describe the steps in mitosis and meiosis and their role in cell and organism growth and reproduction.
10. Explain basic mechanisms used to control gene expression in eukaryotes and prokaryotes.

**Course Requirements:**
The course consists of three interrelated components: lecture, laboratory, and reading assignments. The topics in lecture and laboratory are complementary; both require a review of the reading assignments in advance.

1. **Attendance**
Class and lab attendance, your ability to work constructively with your classmates and instructors, and your attention to safety during the lab are all important for your success in the course. Lectures and labs will begin promptly on schedule and latecomers are responsible for any missed material. Unexcused absence from any lab will result in a grade of zero for that lab and any associated lab assignment. If you miss more than 20 minutes of any lab, that is considered an absence. If you have to miss the laboratory due to sickness or extenuating circumstances (a letter from the appropriate university official or a documented medical excuse), make sure you let your lab instructor know ASAP so that we can determine how best to accommodate your immediate needs with the overall framework of the course. **It is very difficult to make up missed labs when lab sections are full. Once the lab exercise has finished it is not possible for the lab staff to set up the lab again for those who missed the lab. Anyone with more than two absences from lab without prior arrangement will be unofficially withdrawn from the course (grade of WU).**

There will be no make-up exams for lecture or make up quizzes for lab. If you miss an exam or quiz due to extenuating circumstances (a letter from the appropriate university official or a documented medical excuse) your other exam/quiz grades will be adjusted accordingly. Unexcused absence from any exam/quiz will result in a grade of zero for that exam/quiz. If you intend to miss an exam or lab due to a religious observance that is not officially observed by CCNY you must notify your course and lab instructor well ahead of time, not after the fact. Such absences will not be excused if they are not discussed with the instructors ahead of time. Family trips are not considered excused absences, unless they are due to an emergency or due to a death in the family. Any other foreseeable absence (attending a conference, an athletic match, etc.) must be discussed with the instructor ahead of time. If you cannot attend lecture and lab or the exams/quizzes when they are scheduled, I suggest you do not take Bio 101 this semester.

2. **Laboratory**
Always bring the course supplement and any additional lab handout to the lab. It is essential that you read and understand the lab material before lab. We will need to work efficiently to accomplish everything in the lab period, and you will find it difficult to complete the assigned tasks if you have not prepared adequately. Evaluation of your performance in the lab will be based on your participation, the lab quizzes, and several lab assignments (written report or oral presentation).
Group oral presentations are graded as one effort and the group as a whole will receive one grade and feedback form from the instructor. Complaints about how some members of the group may or may not have carried their respective weights are not acceptable excuses for a poor group presentation.

For written assignments, please hand in a printed, typed copy of the lab assignment to your lab instructor. Electronic copies will not be accepted unless previous arrangements have been made with the instructor. All written lab assignments are to be handed in during the lab period on the assigned date, unless otherwise stated. The penalty for unexcused lateness will be 10% of the grade for up to 24 hours after the deadline (from 1 minute to 24 hours), an additional 10% for tardiness after the first 24 hours up to the second 24 hours (from 24 hours + 1 minute to 48 hours), etc., which will include the weekend. I encourage you to work with others in studying for any aspect of the class including the discussion of your laboratory work. **However, each person must turn in her/his own written work in which s/he acknowledges the contribution of others, if any, to her/his thought processes as evidenced in her/his writing. You may not copy any part of somebody else’s written lab work as that would result in a grade of zero for the lab report, even if you acknowledge that you did so!** Jointly written lab assignments will not be accepted and will receive a grade of zero. See citation guidelines in the course supplement.

**Let us be clear:** if you violate the rules above, for example, you plagiarize or copy any part of anybody’s lab report at all, **all parties involved** will receive a grade of zero for the entire assignment, you will not have the chance to rewrite such an assignment, and **a report will be filed with the Office of the Academic Integrity Official** to document your case.

**Laboratory safety rules**
Please read the laboratory safety rules carefully. Your instructor will provide additional information if necessary. **Anybody** entering a biology laboratory must abide by these rules. There will be no exceptions at any time. If you do not follow these rules while in the laboratory you will be asked to leave the lab, that will count as an unexcused absence, you will not be allowed to make up that lab, and you will receive a grade of zero for any assignment associated with that lab.

3. **Lecture Exams**
There will be a total of 4 lecture exams (including the Final Exam) for this course. They will cover material presented in class, information from the assigned readings, and other supplemental material. The exams may include multiple choice questions, short answer questions, short essays, problem solving, and evaluation of data. See the schedule for the dates for the exams.

4. **Online Quizzes**
There will be four quizzes on Blackboard during the course of the semester on the reading assignments. Each quiz is posted on Sunday and you have until midnight on the next Saturday to complete it. There will be no exceptions to these deadlines. **Last minute computer problems are not a valid excuse for missing a quiz.** Make sure to submit the quiz only when you are done
selecting your answers. If you submit prematurely, you cannot return to your quiz. If you do not click on submit, you have not taken the quiz. **If you make any such mistakes, you will not have the chance to redo the quiz or argue about your quiz grade.** As a practice, take the self quiz during the first week of the semester to make sure you know how the system works!

**Evaluation:**
The percentage breakdown of your grade in the course is:
- Lecture exams (4 @ 10% each) 40%
- Online quizzes (4 @ 2.5% each) 10%
- Lab quizzes (3 @ 5% each) 15%
- Lab reports (2 @ 10% each) 20%
- Oral lab assignments (2 @ 5% each) 10%
- Lab participation 5%

Letter grades will be assigned at the end of the semester. The range of grades will be:
- A range: A-: 90.0-94.9%, A: 95.0-100%, A+: exceptional performance
- B range: B-: 80.0-83.9%, B: 84.0-86.9%, B+: 87.0-89.9%
- C range: C-: 70.0-73.9%, C: 74.0-76.9%, C+: 77.0-79.9%
- D: 60.0-69.9%
- F: less than 60%

**E-mail:**
From time to time, you will receive e-mail messages about the course through Blackboard. Please make sure your email address on Blackboard (CUNY Portal) is current. Please check your e-mail regularly. If you have questions about course content or the practice questions (see below), post your questions on the Discussion Board on Blackboard. If you need to schedule a make-up lab or discuss an exam absence, feel free to send me an email. However, you should not expect immediate responses. Please allow 24 hours for a response before you send a reminder email.

**Blackboard:**
Some of your assigned readings are posted on Blackboard. We may also use Blackboard to share other course related information throughout the semester. I will post practice questions, questions for class discussion, suggestions of what to look up in your readings ahead of time, and copies of lecture slides on Blackboard. Also, Blackboard will provide you with an online forum for discussions related to course topics, including the practice questions. You may be asked to post information to the Blackboard site in order to share what you have learned with your classmates (e.g., lab data). As your first assignment in Blackboard, take a minute and introduce yourself to the rest of the class in our Blackboard space on the discussion board under the 60 sec biography. For more information on Blackboard, please visit the following web site:
http://www.ccny.cuny.edu/it/blackboard.cfm

**Academic Integrity and Plagiarism:**
The CUNY Policy on Academic Integrity can be found at
http://web.cuny.edu/academics/info-central/policies/academic-integrity.pdf
This policy defines cheating as “the unauthorized use or attempted use of material, information, notes, study aids, devices or communication during an academic exercise.” The CUNY Policy on plagiarism says the following about plagiarism:

“Plagiarism is the act of presenting another person’s ideas, research or writings as your own. The following are some examples of plagiarism, but by no means is it an exhaustive list:

- Copying another person’s actual words without the use of quotation marks and footnotes attributing the words to their source.
- Presenting another person’s ideas or theories in your own words without acknowledging the source.
- Using information that is not common knowledge without acknowledging the source.
- Failing to acknowledge collaborators on homework and laboratory assignments.

**Internet plagiarism** includes submitting downloaded term papers or parts of term papers, paraphrasing or copying information from the internet without citing the source, and “cutting & pasting” from various sources without proper attribution.

**Obtaining Unfair Advantage** is any activity that intentionally or unintentionally gives a student an unfair advantage in his/her academic work over another student.”

If we suspect any breaches of academic integrity, including plagiarism, we will follow the procedure for addressing violations of academic integrity as approved by The City College Faculty Senate, no exceptions made; i.e., we will report you to the Academic Integrity Official. Disciplinary sanctions range from failing the class to expulsion from the college. If you are unclear about what may or may not constitute academic dishonesty, please ask. At this point in your academic career, you should expect little tolerance for breaches of academic integrity.

**Other Course Policies:**
Please put your cellular phones and pagers on vibrate before entering the classroom for lecture or lab. Please do not eat noisily, carry on long conversations with other students, make or receive telephone calls (except in case of a real emergency, in which case you should carry on the conversation outside the classroom), consistently arrive late, surf the internet, or repeatedly walk in and out of the classroom. These activities are distracting to other students.

**Students with Disabilities:**
http://www.ccny.cuny.edu/accessability/
Your academic success is important to us. Students with disabilities needing accommodations should contact the AccessAbility Center in NAC 1/218, 212-650-5913, prior to communicating with me about your disability.

Contact Information
E-mail:sds@ccny.cuny.edu
Phone: 212-650-5913
TTY\TTD: 212-650-6910
Fax: 212-650-5772

Mailing Address:
Student Disability Services
North Academic Center 1/218
The City College of New York
Convent Avenue at 138th Street
New York, NY 10031

Study Help:

The Counseling Center
http://www.ccny.cuny.edu/counseling/

- The Counseling Center offers short term individual and group counseling to help students deal with their personal and adjustment issues that may interfere with their ability to progress academically to their fullest potential.
- Services are free of charge to City College Students.
- We also help link students with resources within the community (i.e. legal aid, insurance, long term counseling, etc.)

How can someone at the Counseling Center help me?
You aren't "crazy" for coming to the counseling center; rather, you are showing strength by addressing whatever issues you are struggling with directly. Issues we help with include but are not limited to:
- Difficulties focusing or concentrating on schoolwork
- Feelings of sadness
- Feeling exhausted all of the time
- Struggles with motivation
- Stress management
- Time management
- Relationship Problems
- Family difficulties
- Adjustment struggles

Contact Information:
Marshak Science Building
Room J-15
160 Convent Avenue
New York, NY 10031
Phone: 212.650.8222
Fax: 212.650.8227
E-mail: counseling@ccny.cuny.edu

Academic Support Services available to you at CCNY

- Biology Resource Center
The Biology Resource Center is a drop-in multimedia facility designed to allow students to supplement their classroom and laboratory instruction on their own time. Located in the Marshak Science Building, Room J502, students may use the Center's computers to access software packages that cover a variety of topics relevant to their coursework, featuring animation, practice
problems, self-tests, and other learning tools. In addition, students have the use of models, slides, textbooks, and other materials. To check with the Biology Department office for hours of operation call extension 6800.

- **CCAPP**
  
  http://www.ccny.cuny.edu/ccapp/

  CCAPP is the Collegiate Science And Technology Entry Program (CSTEP) at City College. Sponsored by the New York State Department of Education, the mission of CSTEP is to increase the number of historically underrepresented groups who are pursuing professional licensure and careers in mathematics, science, technology and health-related fields. The CCAPP program provides participants with a supportive community of fellow students, faculty and staff that enriches their lives, promotes their academic success and prepares them for entry into professional careers and/or graduate programs. CCAPP serves students throughout their college careers.

  **CCAPP Academic Support Programs:**
  - Summer Program for entering students
  - Academic Support and Enrichment Activities
  - Professional & Career Development
  - Mentoring
  - Academic workshops and seminars

  **Contact Information:**
  Dr. Millicent Roth
  Director
  Marshak Science Building
  160 Convent Avenue
  New York, NY  10031
  Phone:  212.650.5780
  Fax:  212.650.5773
  E-mail: ccappsci@ccny.cuny.edu

- **Writing Center**
  
  http://www.ccny.cuny.edu/writing/

  The City College Writing Center offers one-on-one assistance for students working on writing assignments and projects from any discipline. Visit us whenever you need someone to listen to your ideas, discuss your topics or assignments, and read your drafts. Writing consultants will work with you on planning, drafting, and revising — all of the important steps in your writing process.
Contact Information:
Svetlana Bochman, PhD
Director
North Academic Center
Amsterdam Avenue Plaza
160 Convent Avenue
New York, NY 10031
Phone: 212-650-8104
E-mail: writingcenter@ccny.cuny.edu

- **Program in Pre-Medical Studies**
  [http://www.ccny.cuny.edu/premed/](http://www.ccny.cuny.edu/premed/)
If you are interested in the health professions, check out the program in pre-medical studies. There is a lot of information available on the program web site, and the program offers plenty of resources to help you prepare for your future in the health professions.

Contact Information:
Belinda Smith
Director
Annieta Brown, MPA
Coordinator
Marshak Science Building
Room 529
160 Convent Avenue
New York, NY 10031
Phone: 212.650.6622
Fax: 212.650.7816
E-mail: premedical@sci.ccny.cuny.edu

**Possible Study Group Partners?**
<table>
<thead>
<tr>
<th>Name</th>
<th>e-mail</th>
<th>Telephone</th>
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HOW TO SUCCEED IN THIS CLASS

In Lecture:
- Read assigned pages in the textbook and the supplementary readings before class.
- Attend lecture and participate actively.
- Review your notes after class to clarify any points you do not fully understand.
- Gauge your mastery of the material by reviewing the practice questions on a weekly basis.
- Attend the optional review sessions. Come prepared with questions. Do not be a passive listener.
- Learn how to study for conceptual understanding. That is, while there are some terms the definitions of which you will have to memorize (for example, gene, chromosome), your overall approach to studying should not be simply to memorize the textbook. You need to make sure you understand concepts, understand how to read graphs and charts, understand how to interpret data, and understand how to come up with hypotheses and design experiments to test them. We will work on these ideas in this class.

In Lab:
- Attend every lab and arrive on time for every lab.
- Prepare for lab by reading the lab material in advance.
- Take lab notes in a lab notebook.
- If there are any pre- or post-lab writing assignments, be sure you complete them on time.
- During lab, be sure you understand the principles underlying the experiments. If you do not, ask questions. When working in small groups, consider yourself part of a team. Listen to each group member.
- If the group is making a presentation, do not do all the work yourself, and do not let someone else do all the work. Collaborate.
- Think about how lab activities relate to lecture material.
Chapter readings are from the textbook. See “What you should focus on” on Blackboard. Additional course readings are in the Course Supplement (CS) or on Blackboard (BB) under Content in the merged section.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Readings</th>
</tr>
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<tbody>
<tr>
<td>8/28, 8/29</td>
<td>• No lecture</td>
<td>• Chapter 1</td>
</tr>
<tr>
<td>Labs begin</td>
<td></td>
<td>• Time management for college students (BB)</td>
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<td></td>
<td></td>
<td>• A collection of grammatical points (CS)</td>
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<td></td>
<td></td>
<td>• Citation guidelines (CS)</td>
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<tr>
<td></td>
<td></td>
<td>• The value of science (CS)</td>
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<td></td>
<td></td>
<td>• Worried about Lyme disease? (CS)</td>
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<tr>
<td>9/3</td>
<td>• Intro to course</td>
<td>• Skim Chapters 2-3</td>
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<td></td>
<td>• Cell Theory</td>
<td>• WHO warns against ‘post-antibiotic’ era (BB)</td>
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<td>• Whale earwax a time capsule for stress and toxins (BB)</td>
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<td>• New study brings scientists closer to the origin of RNA (BB)</td>
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<td>• Fish losing survival instinct in acidic oceans (BB)</td>
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<td>• Sea change: the Pacific’s perilous turn (BB)</td>
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<tr>
<td>9/8, 9/10</td>
<td>• Intro to Darwinian Evolution</td>
<td>• Skim Chapter 5</td>
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<td></td>
<td>• The scientific process</td>
<td>• Infections infected (CS)</td>
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<td>• Molecules of life</td>
<td>• Lynn Margulis and the question of how cells evolved (CS)</td>
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<td>• An Ode to SET (CS)</td>
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<td></td>
<td></td>
<td>• Giant virus resurrected from permafrost after 30,000 years (BB)</td>
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<tr>
<td>9/15, 9/17</td>
<td>• Introduction to the cell</td>
<td>• On the origin of eukaryotes (CS)</td>
</tr>
<tr>
<td>Quiz 1</td>
<td>• Evolution of eukaryotes</td>
<td>• Chapter 6</td>
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<tr>
<td>W period begins</td>
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<tr>
<td>on 9/18</td>
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<tr>
<td>9/22</td>
<td>• Membranes and transport</td>
<td>• Biomarkers could predict Alzheimer’s before it starts (BB)</td>
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<tr>
<td>No class on 9/24</td>
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<td>• Using artificial lipid vesicles, biochemists show how membrane proteins transport ammonium (BB)</td>
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<td></td>
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<td>• New membrane protein structure reveals details of peptide transport (BB)</td>
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<tr>
<td>9/29, 10/1</td>
<td>• Exam 1 on 9/29</td>
<td></td>
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<tr>
<td></td>
<td>• Membranes and transport</td>
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<tr>
<td>Date</td>
<td>Topics</td>
<td>News Articles</td>
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<td>-------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 10/6, 10/8 | • Enzymes and metabolism  
• Cell communication               | • Chapter 4  
• New drug could boost diabetics’ insulin levels naturally (BB)  
• Newborns could soon be screened for rare “Pompe” enzyme deficiency disorder (BB)  
• Cheap test slashes time taken to diagnose TB (BB)  
• Chapter 7 |
| 10/15      | • Cell communication                                                  | • Chapter 7  
• Gender bender (CS)  
• Engineered bacterium hunts down pathogens (BB)  
• Study: The smell of men stresses out lab mice (BB)  
• Male scent stimulates female goats’ fertility (BB)  
• The nicotine fix (CS) |
| 10/20, 10/22| • Respiration                                                          | • Chapter 8  
• New study sheds light on evolutionary origin of oxygen-based cellular respiration (BB)  
• Consultation on babies with three people's DNA (BB)  
• Aerobic respiration (CS) |
| 10/27, 10/29| • Exam 2 on 10/27  
• Photosynthesis                                     | • Chapter 9  
• CO₂ makes growing seasons longer (BB)  
• Fibre production drives deforestation in Indonesia (BB) |
| 11/3, 11/5 | • Photosynthesis                                                       | • Chapter 9  
• Surprising sea slug is half-plant, half-animal (BB)  
• Lethal parasite evolved from pond scum (BB)  
• The little pigment that could (CS)  
• Bionic plants offer superpowered photosynthesis (BB)  
• The story of the Calvin cycle (CS) |
| 11/10, 11/12| • The cell cycle and mitosis  
• Meiosis and sexual life cycles                               | • Chapter 10  
• The immortal devil (CS)  
• Chapter 11  
• Fungi borrowed bacterial gene again and again (BB)  
• Gene mutation turns girls into boys (CS)  
• Gene stops ovaries from testifying (CS)  
• Going beyond X and Y (CS) |
### 11/17, 11/19
- Mendelian genetics
- Chapter 12
  - ID for ‘Genetic Adam’ (CS)
  - Silkworm sex factor is no ordinary gene (BB)

### 11/24, 11/26
- Exam 3 on 11/24
- Molecular basis of inheritance
- Chapter 13
  - Extra gene makes mice manic (BB)
  - Pests worm their way into genetically modified maize (BB)

### 12/1, 12/3
- DNA structure
- DNA replication
- From gene to protein
- Quiz 4
- Chapter 14
  - Molecular structure of nucleic acids (CS)
  - Scientists create first living organism with 'artificial' DNA (BB)
  - Sweeping diversity seen in Mexican genomes (BB)
  - Stress alters children's genomes (BB)
  - Chapter 15
  - Cells may stray from 'central dogma' (BB)
  - Decoded fly genome offers clues about sleeping sickness (BB)

### 12/8, 12/10
- From gene to protein
- Regulation of gene expression
- Chapter 16 (16.1-16.2)
  - Immunology: The pursuit of happiness (BB)
  - Lick your rats (BB)
  - Behaviour and biology: The accidental epigeneticist (BB)
  - Fearful memories haunt mouse descendants (BB)

### 12/15
- Regulation of gene expression
- Linnaeus's Asian elephant was wrong species (BB)
- Seeds of conflict (CS)
- DNA, the double-stranded (CS)

### 12/17 6:00-8:15 pm: Exam 4

This syllabus was compiled in collaboration with Drs. Sally Hoskins and Avrom Caplan. There may be changes in the details of the lecture and lab schedule. Pay attention in class and take note of the changes as they are announced.
Lab Schedule:

<table>
<thead>
<tr>
<th>Lab Exercise</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Experimental design</td>
<td>9/2</td>
<td>9/3</td>
<td>8/28</td>
<td>8/29</td>
</tr>
<tr>
<td>2 Experimental design <em>Oral presentations</em></td>
<td>9/9</td>
<td>9/10</td>
<td>9/4</td>
<td>9/5</td>
</tr>
<tr>
<td>3 Experimental design <em>Micropipettor instructions</em></td>
<td>9/16</td>
<td>9/17</td>
<td>9/11</td>
<td>9/12</td>
</tr>
<tr>
<td>4 CSI CCNY <em>Lab reports due</em></td>
<td>9/30</td>
<td>10/1</td>
<td>9/18</td>
<td>9/19</td>
</tr>
<tr>
<td>5 Enzymes <em>Lab quiz 1</em></td>
<td>10/7</td>
<td>10/8</td>
<td>10/2</td>
<td><strong>9/23</strong>  (Tue)</td>
</tr>
<tr>
<td>6 Respiration <em>Oral presentations</em></td>
<td>10/14</td>
<td>10/15</td>
<td>10/9</td>
<td>10/10</td>
</tr>
<tr>
<td>7 Respiration</td>
<td>10/21</td>
<td>10/22</td>
<td>10/16</td>
<td>10/17</td>
</tr>
<tr>
<td>8 Fermentation <em>Oral presentations</em></td>
<td>10/28</td>
<td>10/29</td>
<td>10/23</td>
<td>10/24</td>
</tr>
<tr>
<td>9 Photosynthesis <em>Lab quiz 2</em></td>
<td>11/4</td>
<td>11/5</td>
<td>10/30</td>
<td>10/31</td>
</tr>
<tr>
<td>10 Photosynthesis</td>
<td>11/11</td>
<td>11/12</td>
<td>11/6</td>
<td>11/7</td>
</tr>
<tr>
<td>11 Satellite DNA <em>Lab reports due</em></td>
<td>11/18</td>
<td>11/19</td>
<td>11/13</td>
<td>11/14</td>
</tr>
<tr>
<td>13 Peptide mapping</td>
<td>12/2</td>
<td>12/3</td>
<td>12/4</td>
<td>12/5</td>
</tr>
<tr>
<td>14 <em>Lab quiz 3</em></td>
<td>12/9</td>
<td>12/10</td>
<td>12/11</td>
<td>12/12</td>
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