BMS 3114: GENETICS
Contact:
Professor Alexandra Seidenstein
Office Hours: Monday noon -2 PM or by appointment
Rogers Hall 709
ahs342@nyu.edu (aseidensteinI@icloud.com)

This course is an in-depth introduction to the field of genetics and an examination into the molecular level of eukaryotes and prokaryotes. Topics include history of genetics and Mendelian and non-Mendelian inheritance, structure and function of chromosomes and genomes, biological variation resulting from recombination, mutation, and selection. We will apply genetic concepts to treatments of pathologies such as cancer. Specific objectives of this course are to provide an understanding and discuss ramifications of: 1) Inheritance, 2) Gene Structure, 3) Modern molecular genetics, 4) Gene Mutation, 5) Biological variation resulting from recombination, mutation, and selection, 6) Genetic methods to analyze protein function, gene regulation and inherited disease.

As part of the course, there are full labs to understand basic techniques and principles of genetics in eukaryotes and prokaryotes at the level of molecules, cells, and multicellular organisms, including humans. The lecture component of Genetics will discuss key concepts in Genetics. It is expected that students read the text and lecture notes to understand the detailed concepts covered in the course. Students are encouraged to ask questions during lecture.

Learning Outcome:
After completing this course, you should be able to:

- Demonstrate the ability to use scientific method to design experiments and research background data.
- Understand the basic concepts of genetic structure and function, and how this applies to research and pathology.
- Demonstrate an understanding of library research.
- Demonstrate an understanding of Mendelian and other Inheritance patterns.
- Demonstrate an understanding of how genetic inquiry has driven medical research.
- Demonstrate an understanding of molecular genetic mechanisms.
- Predict the influence of abnormalities on protein function and disease.
- Connect environmental changes to development, growth, and heredity.
- Demonstrate an understanding of biohazards.
- Demonstrate an understanding of genetic and molecular laboratory techniques.
Policies:

- Classes will end on the very last day of class and the final exam will be cumulative. Please do not expect exams to be scheduled before the last day of the NYU final exam week.
  - NO make-ups for missed exams
  - NO extra time for entering exams/quizzes late.
  - NO video recording of the class, however audio recording will be permitted.
  - NO curves will be offered.
  - NO extra credit or work will be offered.
- Please read all the chapters assigned before the meeting of classes.
- **Academic Integrity:**
  - Plagiarism is the word-for-word reproduction of another writer's work or ideas; paraphrasing without proper attribution also constitutes plagiarism. Neither will be tolerated in this class. Please see the discussion of plagiarism in the *Student Guide of Academic Integrity* (https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html) for more detailed information. Penalties for plagiarism range from a failing grade for a paper or a course to dismissal from the University.
    - *The penalty for plagiarism in this class is a failing grade.*
- **Students with Disabilities:**
  - Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Moses Center for Students with Disabilities at (212) 998-4980 as soon as possible to better ensure that such accommodations are implemented in a timely fashion. For more information, see the CSD website: http://www.nyu.edu/life/safety-health-wellness/students-with-disabilities.html
  - **Moses Students:**
    - Members of Student Services must meet with me within the first 2 classes so arrangements can be made. Any students that fail to identify themselves may not be considered for accommodation.

- Communication: by e-mail ahs342@nyu.edu / State full name, ID# and full course # in all correspondences.
- Final Exam schedules are set by the University and therefore, I do not have control over this.
  - Please DO NOT assume that the exam will be before the last possible day of the final exam schedule.
  - Please DO NOT schedule any personal events before the last possible day of the final exam schedule.
  - If you miss the final exam and have carried a passing grade, you WILL receive a grade of an INCOMPLETE until the final is taken.
How to study for the course:
1. Read chapters ahead.
2. Learn the vocabulary.
3. Take notes in class.
4. Reread section of the text that corresponds to the work in class.
5. Rewrite your notes with corresponding section of the text.
6. Reread the notes in the morning before class, along with new work.
7. Get notes from colleagues and compare them to yours.

Course Prerequisites: Biology 1 and 2; General Chemistry, Organic Chemistry


Grading: 60% Lecture + 40% of Lab Grade
Lecture Grade:

Assignments and Class Participation: 15%
Assignments will consist of problem sets and Article Reviews that will be handed out throughout the semester. The due dates of the problems are listed in the syllabus and must be handed in at the beginning of class. Assignments that are 1 day late will lose 10%, assignments up to 1 week late will lose 25%. Late assignments after 1 week will not be accepted.

Midterms (2): 50% - Given during class on the dates listed on the syllabus

Final: 35% - Given during finals week
- A = 96% +; A- = 92 - 96; B+ = 88 - 92; B = 84 - 88; B- = 80 - 84; C+ = 76 - 80; C = 72 - 76; C- = 68 - 72; D+ = 64 - 68; D = 60 - 64; F = <60
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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Chapters</th>
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<tbody>
<tr>
<td>1</td>
<td>09/04/17</td>
<td>History of Genetics &amp; Introduction to Mendelian Genetics (no class 9/05)</td>
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<td>2</td>
<td>09/11/17</td>
<td>Mendelian Genetics</td>
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<td>3</td>
<td>09/18/17</td>
<td>Patterns of Inheritance</td>
<td>3 &amp; 4</td>
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<td><em>Problem Set #1 Due 09/20/17</em></td>
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<td>4</td>
<td>09/25/17</td>
<td>Chromosome Structure and Mapping</td>
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<td><em>Paper #1 Due 09/28/17</em></td>
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<td>5</td>
<td>10/02/17</td>
<td>Chromosome Variation</td>
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<td>10/09/17</td>
<td>DNA Structure (no class 10/09/17)</td>
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<td><em>Problem Set #2 Due 10/16/17</em></td>
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<td>10/16/17</td>
<td><strong>MIDTERM 1 (10/16/17)</strong></td>
<td>9 &amp; 10</td>
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<td>8</td>
<td>10/23/17</td>
<td>DNA Structure and Replication</td>
<td>10 &amp; 11</td>
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<td>9</td>
<td>10/30/17</td>
<td>Transcription</td>
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<td><em>Paper #2 Due 11/1/17</em></td>
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<td>10</td>
<td>11/06/17</td>
<td>Translation</td>
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<td><em>Paper #3 Due 11/08/17</em></td>
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<td>11</td>
<td>11/13/17</td>
<td>Gene Regulation &amp; Repair</td>
<td>15 &amp; 16</td>
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<td>12</td>
<td>11/20/17</td>
<td><strong>MIDTERM 2 (11/15/17)</strong></td>
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<td><em>Paper #4 due 11/20/17</em></td>
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<td>13</td>
<td>11/27/17</td>
<td>Repair</td>
<td>16 &amp; 18</td>
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<td>Recombinant DNA/Technology</td>
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<td>14</td>
<td>12/04/17</td>
<td>Genomics, Proteomics, bioinformatics</td>
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<td><em>Paper #5 Due 12/06/17</em></td>
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<td>12/11/17</td>
<td>Cancer and Personalized Medicine</td>
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<td><em>12/13/17 - Tuesday running on Monday schedule</em></td>
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<td><strong>FINAL EXAM –TBD</strong></td>
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