BIO 230: GENOMES & GENETIC ANALYSIS  
Spring 2019

INSTRUCTORS:  
Dr. Samantha Torquato  
Office: Sabin-Reed Hall 339  
Phone: 413-585-4632  
E-mail: storquat@smith.edu

Dr. Steven Williams  
Office: Ford Hall 113  
Phone: 413-585-3826  
Email: swillian@smith.edu

LECTURE TIME & LOCATION:  
MWF 11:00 AM – 12:10 PM  
Ford Hall 240

DISCUSSION TIMES & LOCATIONS:  
M 1:10 - 2:00 PM, Sabin-Reed Hall 220  
T 1:00 - 1:50 PM, Bass Hall 210  
W 2:40 - 3:30 PM, Bass Hall 203

Office Hours: Fridays 1:30 – 3:30 PM and by appointment.

COURSE DESCRIPTION:  
An exploration of genes and genomes that highlights the connections between molecular biology, genetics, cell biology, and evolution. Topics include: DNA and RNA, protein structure and function, gene organization and networks, mechanisms and control of gene expression, and origins and evolution of molecular mechanisms. You will be exposed to the principal experimental and computational tools that have advanced relevant fields and to the rapidly expanding databases at the core of contemporary biology. Through primary literature, you will also investigate the molecular biology of infectious diseases, genetic underpinnings of development and cancer, the comparative analysis of whole genomes, and the origin and evolution of genome structure and content.

COURSE OBJECTIVES:  
1. Understand the organization and evolution of living systems at the genomic and molecular levels.

2. Explore the fundamental mechanisms responsible for the transmission, organization, regulation, and expression of genetic information.

COURSE RESOURCES:  
- We will rely heavily on Moodle (http://moodle.smith.edu) for the transmission of all information regarding this course. This includes, but is not limited to, PowerPoints for each lecture, discussion section assignments (such as problem sets and primary research articles), exam material, etc.

- Course announcements will be distributed via email, so please check your school email account regularly.

COURSE TEXTBOOK:  
Genetics: From Genes to Genomes, 6th edition by Leland H. Hartwell, et al. is the required textbook for this course. Please refer to the email that was sent by Dr. Torquato on 01/14/2019 for additional textbook information.

COURSE TUTORS:  
This course has two tutors through the Spinelli Center. We urge you to take advantage of this support system as this course will move quickly and your understanding of major concepts depends on not falling behind with the material. Please see the tutors’ contact information as well as the tutoring hours and locations on the next page.
COURSE ASSIGNMENTS:

For Lecture: Please note that the following assignments should be completed individually.

1. **Required Textbook Readings:** Please refer to the reading assignments listed on the Tentative Lecture Schedule, which is posted on Moodle. All readings are expected to be completed just before or after each given lecture.

2. **Recommended Textbook Problems:** Please refer to the problems listed on the Tentative Lecture Schedule, which is posted on Moodle. All problems are expected to be completed just after each given lecture. Answer keys to Recommended Textbook Problems will be posted on Moodle weekly. After you first attempt these problems independently, you may then address remaining confusion with your study team (see below for more information).

For Discussion Section: Please note that the following assignments should be completed in small groups.

1. **Study Teams:** During the first Discussion Section meeting, study teams of 4-5 students will be formed. Then, the entire team will email both professors (i.e. one email with all group members CC’ed) so that we have a record of who is working together. For the duration of the semester, your study team will work as one entity on many assignments and to prepare for Exams 1 and 2 (see below for more information).

2. **In-class Participation:** Active participation in the classroom is essential for the success of Discussion Section and directly correlates with how much you will learn from this entire course. Active participation includes, but is not limited to, each student arriving to class on-time, being prepared to discuss the given topic, and working well with their study team on every assignment.

3. **Weekly Required Assignments:** Each study team is expected to work on a Weekly Required Assignment that will be posted on Moodle. Please see below for more information on the types of assignments to except this semester. Also, please note that an answer key to each assignment will be posted on Moodle following its due date.
   a. **Problem Sets:** Problem sets will be posted on Sunday evenings. These problem sets will also act as study guides for the course exams. Please refer to the Tentative Discussion Section Schedule, which is posted on Moodle, for individual due dates.
   b. **Primary Research Articles:** Students must read the given experimental paper before Discussion Section and be prepared to discuss the background, methods, and findings of the article in-class. Handouts containing article-specific questions will be given during Discussion Section and answers are expected to be turned in by the end of class. Please refer to the Tentative Discussion Section Schedule, which is posted on Moodle, for more information.

Final PowerPoint Assignment:

1. Each study team will choose a genetics/genomics-related topic on which to complete in-depth research. Topics must be submitted through Moodle no later than 5 PM on Thursday, February 21st and will be approved by both professors within 10 days.
2. Each study team will compile a list of 5-10 relevant research sources and submit an annotated bibliography through Moodle no later than 5 PM on Friday, March 29th.
3. Each study team will create a 25 to 30-slide PowerPoint presentation on the approved topic. More assignment details and former PowerPoint presentation examples will be provided during Discussion Section. For additional expectations, please see the Final PowerPoint Grading Rubric posted on Moodle. The Final PowerPoint Presentation is due on Moodle no later than 5 PM on Thursday, May 2nd.

Late Assignment Policy: For each day, or part thereof, that an assignment is submitted after the due date and time, 10% of the total points will be deducted from that assignment.
COURSE EXAMS:

Please note that all exams are to be taken individually (i.e. not with your study team) and are closed-book (i.e. no notes may be used during the exams).

Exam 1: This exam will be available in Seeyle Hall from Thursday, March 21st at 5 PM to Sunday, March 24th at 11 PM. Students must take the exam over a consecutive period of 120 minutes. Additional information on Seeyle Hall exams will be posted on Moodle. Exam questions will focus on material covered in all lectures from January 25th to March 8th and Dr. Torquato’s discussion sections.

Exam 2: This exam is self-scheduled (i.e. it will take place during Smith College’s final examinations period between Tuesday, May 7 and Friday, May 10). Students will be limited to 2 hours and 20 minutes (including travel time) to complete this exam. For more information on Smith College’s self-scheduled exam policies, please visit the following webpage: https://www.smith.edu/about-smith/registrar/finals. Exam questions will focus on material covered in all lectures from March 18th to May 2nd and Dr. Williams’ discussion sections.

COURSE GRADING:

The following represents the percentage breakdown of your final grade by each course component:

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>25%</td>
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<tr>
<td>Exam 2</td>
<td>25%</td>
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<tr>
<td>Discussion Section</td>
<td>30%</td>
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<tr>
<td>In-Class Participation</td>
<td>10%</td>
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<tr>
<td>Weekly Required Assignments</td>
<td>20%</td>
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<tr>
<td>Final PowerPoint Assignment</td>
<td>20%</td>
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COURSE ATTENDANCE POLICY:

For Lecture: It is expected of each student to attend every lecture as active learners. During lectures, we will ask students to answer questions individually or in small groups. We also hope to be interrupted frequently by students in order to address individual questions. You will not be able to solely rely on each lecture’s posted PowerPoint to fully understand the given topic because we will also utilize the classroom’s board to explain major concepts.

For Discussion Section: It is required of each student to attend every discussion section as each of you will sign-in to class within the first two minutes. If serious illness or a family emergency prevents you from attending your discussion section, you must notify the professors immediately. In addition, you must provide written documentation explaining the reason for your absence from a responsible authority, such as Health Services or your Class Dean. Consideration will also be given to students for religious observation, provided that the individual speaks with the professors at the beginning of the semester. An absence due to serious illness, family emergency, and/or religious reasons will involve a conversation with the professors in order to determine an appropriate make-up assignment for each discussion section missed.

ADDITIONAL COURSE EXPECTATIONS & INFORMATION:

The Academic Honor Code: For the entire duration of this course, students are expected to abide by the Smith College Honor Code. Plagiarism and cheating will not be tolerated on any of the course assignments and exams. For all assignments (including Problem Sets, Primary Research Article Handouts, and the Final PowerPoint), the sources of all ideas that are not your own must be properly cited. Please ask the professors if you are uncertain about the expectations for any course assignment or exam. All suspected cases of plagiarism
and cheating will be investigated as possible breaches of the Honor Code. For additional information, please refer to the Student Handbook: http://www.smith.edu/sao/handbook/socialconduct/honorcode.php.

**Special Accommodations:** Any student requiring academic adjustments or accommodations in order to complete the assigned coursework or participate in this class must be registered with the Office of Disability Services and provide formal written documentation of the requested accommodations to the professors in advance. Please contact Laura Rauscher (Director of Disability Services; College Hall 104) or visit http://www.smith.edu/ods/ for more information. We also welcome all students to speak with us so that we can discuss how to best meet your learning needs.