BIOS 2600 Syllabus

**BIOS2600 B, BIOS2600 Q and BIOS2344 RBS – 3 credit class**

**MWF 8:00 – 8:50 AM; Sustainable Education 110, Aug 20th – Dec 13th, 2018**

**Instructor Information**

|  |  |  |
| --- | --- | --- |
| Instructor | Email | Office Hours & Location |
| Dr. Patrick McGrath  Dr. Matthew Torres | [patrick.mcgrath@biology.gatech.edu](mailto:patrick.mcgrath@biology.gatech.edu)  [mtorres35@gatech.edu](mailto:mtorres35@gatech.edu) | By appointment – EBB1-3013  By appointment – EBB1-4009 |
| **Teaching Assistant(s)** | **Email** | **Office Hours & Location** |
| Ms. Amanda Schaefer | aschaefer8@gatech.edu | By appointment or Skype |

**General Information**

**Description**

This is a special dual enrollment genetics class that includes both Georgia Tech students and high school students combined into a single course. Classes are taught on the Georgia Tech campus while being delivered via live video or internet feed to students in classrooms at partner high schools in Georgia and for Study Abroad students. On campus Georgia Tech students register for Section B - CRN 89333, high school students register for Section Q - CRN 90257, and Georgia Tech students studying abroad in Barcelona register for Section RBS – CRN 91593. The content and academic level of this dual enrollment class is the same as the regular Georgia Tech genetics classes.

## Pre- &/or Co-Requisites

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| --- |
| BIOS 1107 AND (BIOS 1107L OR BIOS 1207L) OR BIOL 1510 OR BIOL 1511. |

## Course Goals and Learning Outcomes

By the end of this class, students will be able to: (1) understand fundamental and applied concepts in genetics, (2) apply biological principles to solving genetics problems, (3) interpret and analyze genetics experiments, (4) explain methods and techniques use in genetic analyses, and (5) explain how biological information is stored and transmitted.

**Course Requirements & Grading**

Your grade will be determined by a combination of regularly scheduled quizzes, in-class activities, and online homework assignments combined with in-class exams. The relative value of these assessments are:

|  |  |  |
| --- | --- | --- |
| Assignment | Date | Weight (Percentage, points, etc) |
| Activities, Quizzes, Mastering Genetics | Throughout the semester | 35% |
| Exam I | Sept 14th | 15% |
| Exam II | Oct 12th | 15% |
| Exam III | Nov 5th | 15% |
| Final Exam | Dec 13th | 20% |

**Extra Credit Opportunities**

N/A

**Description of Graded Components**

Mastering Genetics Homework: Throughout the semester you will have online homework assignments administered through Mastering Genetics. The Mastering Genetics assignment scores are recorded and will comprise part of your overall course grade. Homework will test your understanding of course material, and will serve as a guide for exams. Homework deadlines will be provided in class on a rolling timeline and will be due on the date specified in class.

In-class quizzes: We will use Learning Catalytics for interactive class sessions. You can use any internet-enabled device (e.g., laptop, tablet, smartphone) to access Learning Catalytics during class. However, the professors reserve the right to administer written quizzes if deemed necessary. You must be present in class to take the Learning Catalytics quiz. Attempting to take these quizzes outside of class is considered an Honor Code violation.

In-class activities: Many classes will feature activities designed to increase your comprehension of important topics in genetics. These activities will be facilitated through Learning Catalytics.

Exams: The class will include four exams. The first three exams will be held during class time on the dates provided on the class schedule. The last exam will not be comprehensive and will, instead, cover material from the last fourth of the semester. Exams are closed-book and will be made up of multiple-choice and short-answer questions based on topics, materials, and discussions presented in lecture, through Learning Catalytics quizzes, in the assigned readings, and in the Mastering Biology assignments.

**Grading Scale**

The most stringent scale used for grading will be following scale:

A 90-100%

B 80-89%

C 70-79%

D 60-69%

F 0-59%

This scale is subject to adjustment at the professor’s discretion. All problems regarding grades on assignments must be handled through the regrade system.

See <http://registrar.gatech.edu/info/grading-system> for more information about the grading system at Georgia Tech.

**Course Materials**

**Course Text**

WS Klug, MR Cummings, CA Spencer, MA Palladino, and DJ Killian. Concepts of Genetics. 12th edition. Pearson. 2019. The textbook is an excellent resource for learning and understanding genetics. To maximize your understanding of course material and do well on the class assignments, you will need to complete each reading assignment *before* the relevant class. The textbook contains problems at the end of each chapter that you should attempt to solve. These textbook problems will not be handed in or graded. However, your success in answering these problems will be a good indication of how you will do on the exam. In addition, some questions for the exams will be taken directly from the textbook

## Additional Materials/Resources

We will use Mastering Genetics and Learning Catalytics throughout the class, which will require purchasing an access code. This should come bundled together with the textbook if purchased through the bookstore. You can also purchase access to Mastering Genetics and Learning Catalytics through Pearson directly.

## Course Website and Other Classroom Management Tools

All class material will be uploaded to the Canvas website.

**Course Expectations & Guidelines**

## Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or <http://www.catalog.gatech.edu/rules/18/>.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations. Please note that all quizzes must be taken in the classroom. Attempts to take the quizzes outside of the classroom, or facilitating other students taking the quizzes outside of the classroom, will be considered cheating.

## Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

## Attendance and/or Participation

Class time will be used for lectures, quizzes, group activities, and exams. If you miss lecture, *you* are responsible for obtaining all notes, announcements, and assignments. Written confirmation of a legitimate excuse, such as a severe illness, will be required if any assessment is missed. The institute’s excused absence policy will be enforced in this course (http://www.catalog.gatech.edu/rules/4/). *No exceptions!*

## Collaboration & Group Work

This class will require large amounts of in-class group work.

## Extensions, Late Assignments, & Re-Scheduled/Missed Exams

There will be no credit given for any assignments turned in after the deadline. Students that miss any assignments/exams for approved Institute activities and religious observances will be excused for any missed credit. See <http://www.catalog.gatech.edu/rules/4/> for more information.

## Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

## Student Use of Mobile Devices in the Classroom

Lecture is a time when we all work together, so be courteous to your fellow students and do not disrupt class by entering and leaving the room, reading, talking, allowing cell phones to ring, etc. In addition, do not use your electronic devices (laptops, tablets, smartphones, etc.) for non-class use.

## Additional Course Policies

Regrade policy: The *only way* that changes to your grades will be considered is through the procedure below. Do not approach the professor or TAs and ask for credit for an already-graded question without a written description of the problem.

Regrades can be requested if:

1. there has been an error in adding together your score.
2. you did not receive credit for an answer as given on the key.
3. there is a difference between your score and that of another student who gave the same answer.
4. you did not receive credit for an answer that differs from that on the key but which is nevertheless correct.

In general, regrades will not be considered for issues concerning the amount of credit awarded for an answer. For example, questions such as ‘Why did I receive only two points for this answer instead of three?’ will not be addressed unless you find evidence of issue (3).

To have an assignment regraded, you must submit a *hard-copy*, *typewritten* explanation of the problem along with your original exam or quiz directly to the professor (email appeals will not be considered). For issues (1) and (2), it will generally suffice to simply describe the problem. For issue (3) you will need to submit an explanation of the problem, as well as both copies of the material. For issue (4) you must give a detailed and explicit account as to why your answer is correct. In general, this may require direct quotes from the text or precise mathematical treatments as to how your solution or model yields the correct ratios, genotypes, results, etc.

Deadlines for the submission of regrades will be one week after the grade is returned to the students. *No regrades will be considered after the deadline.* Note that if you request a regrade for a particular question, your entire exam or quiz may be regraded, which could result in a lowering of your overall score.

**Campus Resources for Students**

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

**Academic support**

* Center for Academic Success <http://success.gatech.edu>
  + 1-to-1 tutoring <http://success.gatech.edu/1-1-tutoring>
  + Peer-Led Undergraduate Study (PLUS) <http://success.gatech.edu/tutoring/plus>
  + Academic coaching http://success.gatech.edu/coaching
* Residence Life's Learning Assistance Program

<https://housing.gatech.edu/learning-assistance-program>

* + Drop-in tutoring for many 1000 level courses
* OMED: Educational Services (<http://omed.gatech.edu/programs/academic-support>)
  + Group study sessions and tutoring programs
* Communication Center (<http://www.communicationcenter.gatech.edu>)
  + Individualized help with writing and multimedia projects
* Academic advisors for your major

<http://advising.gatech.edu/>

**Personal Support**

Georgia Tech Resources

* The Office of the Dean of Students: <http://studentlife.gatech.edu/content/services>; **404-894-6367**; Smithgall Student Services Building 2nd floor
  + You also may request assistance at <https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?>
* Counseling Center: <http://counseling.gatech.edu>; **404-894-2575**; Smithgall Student Services Building 2nd floor
  + Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
  + *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at* ***404-894-2204****.*
* Students’ Temporary Assistance and Resources (STAR): <http://studentlife.gatech.edu/content/need-help>
  + Can assist with interview clothing, food, and housing needs.
* Stamps Health Services: <https://health.gatech.edu>; **404-894-1420**
  + Primary care, pharmacy, women’s health, psychiatry, immunization and allergy, health promotion, and nutrition
* OMED: Educational Services: <http://www.omed.gatech.edu>
* **Women’s Resource Center:** [**http://www.womenscenter.gatech.edu**](http://www.womenscenter.gatech.edu)**; 404-385-0230**
* **LGBTQIA Resource Center:** [**http://lgbtqia.gatech.edu/**](http://lgbtqia.gatech.edu/)**; 404-385-2679**
* **Veteran’s Resource Center:** [**http://veterans.gatech.edu/**](http://veterans.gatech.edu/)**; 404-385-2067**
* **Georgia Tech Police:** **404-894-2500**

**Statement of Intent for Inclusivity**

As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.

**Course Schedule**

*This schedule is subject to change!*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week | Date | Topic | Chapter | Instructor |
| 1 | 20-Aug | Introduction to Genetics | 1 | MT/PM |
|  | 22-Aug | Mitosis and Meiosis | 2 | PM |
|  | 24-Aug | Mitosis and Meiosis | 2 | PM |
| 2 | 27-Aug | Mendelian Genetics | 3 | PM |
|  | 29-Aug | Mendelian Genetics | 3 | PM |
|  | 31-Aug | Extensions of Mendelian genetics | 4 | PM |
| 3 | 3-Sept | No Class – Labor Day |  |  |
|  | 5-Sept | Extensions of Mendelian genetics | 4 | PM |
|  | 7-Sept | Extensions of Mendelian genetics | 4 | PM |
| 4 | 10-Sept | Chromosomal Mutations | 8 | PM |
|  | 12-Sept | Review/Flex day |  | PM |
|  | 14-Sept | EXAM I (on Chapters 2 – 4, 8) |  | PM |
| 5 | 17-Sept | Chromosome Mapping in Eukaryotes | 5 | PM |
|  | 19-Sept | Chromosome Mapping in Eukaryotes | 5 | PM |
|  | 21-Sept | Chromosome Mapping in Eukaryotes | 5 | PM |
| 6 | 24-Sept | Genetic Analysis in Bacteria | 6 | PM |
|  | 26-Sept | Genetic Analysis in Bacteria | 6 | PM |
|  | 28-Sept | Sex Determination and Chromosomes | 7 | PM |
| 7 | 1-Oct | Sex Determination and Chromosomes | 7 | PM |
|  | 3-Oct | Population and Evolutionary Genetics | 25 | PM |
|  | 5-Oct | Population and Evolutionary Genetics | 25 | PM |
| 8 | 8-Oct | No class – Fall break |  |  |
|  | 10-Oct | Review/Flex day |  | PM |
|  | 12-Oct | EXAM II (on Chapters 5-7, 25) |  | PM |
| 9 | 15-Oct | DNA Structure and Analysis | 10 | MT |
|  | 17-Oct | DNA Structure and Analysis | 10 | MT |
|  | 19-Oct | DNA Replication and Recombination | 11 | MT |
| 10 | 22-Oct | DNA Replication and Recombination | 11 | MT |
|  | 24-Oct | DNA Organization in Chromosomes | 12 | MT |
|  | 26-Oct | Recombinant DNA Technology | 20 | MT |
| 11 | 29-Oct | Recombinant DNA Technology | 20 | MT |
|  | 31-Oct | DNA Forensics | ST02 | MT |
|  | 2-Nov | Review |  | MT |
| 12 | 5-Nov | EXAM III |  | MT |
|  | 7-Nov | The Genetic Code and Transcription | 13 | MT |
|  | 9-Nov | The Genetic Code and Transcription | 13 | MT |
| 13 | 12-Nov | Translation and Proteins | 14 | MT |
|  | 14-Nov | Gene Mutation, DNA Repair, and Transposition | 15 | MT |
|  | 16-Nov | Gene Mutation, DNA Repair, and Transposition | 15 | MT |
| 14 | 19-Nov | Regulation of Gene Expression in Bacteria | 16 | MT |
|  | 21-Nov | No class – Thanksgiving break |  |  |
|  | 23-Nov | No class – Thanksgiving break |  |  |
| 15 | 26-Nov | Regulation of Gene Expression in Bacteria | 16 | MT |
|  | 28-Nov | Cancer Genetics | 24 | MT |
|  | 30-Nov | CRISPR-Cas and Genome Editing | ST01 | MT |
| 16 | 3-Dec | Final instruction day |  | MT |
|  | 5-Dec | No class |  |  |
|  | 7-Dec | No class |  |  |
| 17 | 13-Dec | FINAL EXAM (8:00 – 10:50 AM) |  | MT |