BIOS 4802 / BIOL 7963: Advances in Molecular Biology
Tentative Syllabus

2 credit class

Instructor Information

Instructor	Email	Office Hours & Location
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General Information

Description

This course will cover topics of current interest in molecular biology. It will be based on the analysis of review and research papers in the field. Students will be exposed to breakthrough research in the field of molecular biology, learn how to analyze scientific literature, make connections between different publications and summarize research achievement in specific areas. Professor will choose topics for analysis, give some introductory lectures and provide initial papers. Graduate students, in consultations with Professor, will search for and suggest additional literature. Both graduate and undergraduate students will make presentations to the class, and will be assigned to ask questions on presentations. To broaden the student perspective, the course will occasionally incorporate guest lectures, given by experts in the specific fields covered in the class.

Prerequisites

BIOL 7693: Graduate status in Biology or Bio-related field.

BIOS 4802: At least one of the following courses: BIOS 2600 (Genetics), or BIOS 2610 (Integrative Genetics), or BIOS 3450 (Cell and Molecular Biology), or CHEM 3521/4511 (Biochemistry I), or BMED 3600 (Physiology of Cellular and Molecular Systems), OR consent of the instructor. GPA 3.0 or above is recommended.

Course Materials

Journal articles, website links of interest, presentations posted on Canvas.

Course Mode

The course is expected to be taught in person (face-to-face format). Live attendance is critical, as in class activity is a significant component of grade. In case if there are any changes in the mode of teaching during semester, students will be informed. Any changes would be communicated through Canvas; please follow the announcement closely. *Please refer to Georgia Tech safety guidelines.*

Course Objectives

Upon completion of this course, students will be able to:

1. *Analyze Key Molecular Biology Breakthroughs:* Identify and explain major current achievements within selected topics of molecular biology.
2. *Execute Effective Literature Searches:* Use search strategies using scientific databases to retrieve relevant, peer-reviewed literature in the field.
3. *Synthesize Scientific Literature:* Extract core methodologies and findings from molecular biology papers and map conceptual connections across multiple studies on a given topic.
4. *Deliver Professional Presentations:* Design and deliver clear, structured, and engaging scientific presentations tailored to an academic audience.
5. *Engage in Scientific Discourse:* Formulate evidence-based arguments and actively contribute to professional discussions regarding molecular biology concepts.

Grading Criteria

BIOS 4802: Presentations - 40%; in class activity – 30%; quizzes and write-up assignments – 30%.

BIOL 7963: Presentations - 40%; paper search and suggestions – 20%; in class activity – 20%; quizzes and write-up assignments – 20%.

Extra credit will be assigned for exceptional level of participation in the in-class activities.

Grading Scale: A - 90-100%; B - 80-89%; C - 70-79%; D - 60-69%; F - 0-59%.

Description of Graded Components

This is the first time BIOS 4802 will be offered to undergraduates, and first time BIOL 7963 will be offered in a combination with an undergraduate class. I am also using a new format in which students will present on both individual papers and on whole topics. Therefore, current description is tentative. I anticipate modifying the assignments depending on enrollment numbers, and also in response to my observations and student feedback.

Presentations: Most classes will include student presentations on relevant topics. There will be two types of presentations: presentations of individual papers, and presentations on a broader topic. Both graduate and undergraduate will present individual papers, while graduate students will also search for literature and present on whole topics. Therefore, it is tentatively expected that every graduate student will make at least two presentations, about 30-40 min each (not including questions and discussions), and every undergraduate student will make at least one presentation, 30 min each, not including questions and discussion. These numbers could be modified depending on enrollment. Presentations will be discussed with and approved by instructor prior to presenting to the class. Each presentation will be evaluated by instructor (50% of score) and by the whole class (50% of the score combined). Students will present written evaluations with comments, justifying scores. Comments will be considered as graded write ups.

Paper search and suggestions: Will be related to presentations of the whole topics. Appropriated ness of the paper choices and completeness of the topic coverage will be graded.

In class activity: Will include participation, questions and comments on presentations, and extra point questions. Attendance polls will be taken as class requires participation. In addition to making their

own presentations, every student will be assigned to mask questions and/or make discussion comments on presentations by others. Every student is expected to have about three such assignments during the semester (these numbers could be modified depending on the enrollment). These questions/comments will be graded. Students are also encouraged to ask questions and/or make comments on unassigned presentations, that could provide extra points at the instructor's discretion.

Quizzes and Write-ups: In class quizzes (~10 min each) reviewing presentation materials will be offered periodically with a prior notice. 4 or 5 quizzes are expected to be offered during a semester; the best 2 or 3 quizzes will contribute to the in-class score. Quiz questions and correct answers will be discussed in the class after each quiz is completed. Write ups will include evaluations and comments on each opresentation (see above). Additional homeworks could be assigned (two or three are expected during a semester) to solicitate student opinions on questions raised during discussion in the class. In case if class includes invited lectures, additional write ups will be assigned on each lecture, that would ask to provide a brief summary and major impressions. Evaluations and write ups will have strict deadlines, and timely submission will be a component of scoring; 10% of the score will be subtracted per each day of delay.

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 the 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 quiz 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.

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, presentations, quizzes and discussions. If you miss a class period, 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 active participation in the in-class group activities and discussions.

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

There will be either point subtractions (if specified in the assignment rules) or no credit given (if not specified) for any assignments turned in after the deadline. For students that miss any

assignments/exams for approved Institute activities and religious observances, separate arrangements will be made if proper documentation is provided. 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, while in class, do not use your electronic devices (laptops, tablets, smartphones, etc.) for activities unrelated to class.*

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
- Residence Life's Learning Assistance Program https://housing.gatech.edu/learning-assistance-program
- OMED: Educational Services (http://omed.gatech.edu/programs/academic-support)
- Communication Center (http://www.communicationcenter.gatech.edu)
- 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
    - 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
- OMED: Educational Services: http://www.omed.gatech.edu
- Women's Resource Center: http://www.womenscenter.gatech.edu; 404-385-0230
- Veteran's Resource Center: http://veterans.gatech.edu/; 404-385-2067
- Georgia Tech Police: 404-894-2500