

**GBS 708 – Genetics**

2 Credit Hours | Fall 2018 | August 7 – September 17, 2018 | 8-10am | BBRB 170

**Course Director:** Dr. David Schneider | dschneid@uab.edu

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**GBS Vision Statement:**

“Demonstrating world-class excellence in all areas of biomedical research through the achievements of our students.”

**GBS Mission Statement:**

“Driving biomedical discovery through interdisciplinary training and innovative research.”

**GBS Core Competencies:**

GBS offers a wide array of courses, seminars, journal clubs, research opportunities, and professional development that are designed to support the growth and development of our students. The following list consists of desirable competencies for our students to achieve while in this course:

- Content-Specific Conceptual Knowledge
- Critical Thinking and Data Evaluation
- Communication Skills
- Career Exploration and Preparation
- Responsible Conduct of Research

**Course Objectives:**

The purpose of this course is to provide foundational knowledge to students as they prepare for graduate education and beyond. This course will equip students with a basic understanding of molecular genetics. The lectures are organized to follow the central dogma of molecular biology. Similarities and differences between prokaryotic and eukaryotic genetic systems will be described throughout the course.

**Review Articles or Problem Sets**

Each lecturer can provide a review article covering the topics of the presentations delivered. These articles provide overviews of the areas of research without being bogged down in experiments details. The objective of providing these articles is to aid the students' skills in reading familiar and unfamiliar research findings and to provide an alternative delivery method for fundamental knowledge of the topic. Material in the review articles can be topics around which take-home exam questions are crafted.

As an alternative to a comprehensive review, the lecturer may provide the students with a list of problems or experimental questions to evaluate during the week and discuss on the following Friday.

**Methods required for these discoveries**

On the evening before “methods” day, each student will submit (via Canvas) an inquiry regarding one or more methods that result in the discoveries/findings described in the two previous lectures. These inquiries will be delivered to the lecturer the lecturer (with assistance from the course director) will address as many as feasible during the following class period.

Inquiries need not be elaborately formatted, just interpretable and based on the material presented.

**Grading:**

Each week students will be assigned a take-home exam. Each exam will consist of a series of questions requiring synthesis of the material, investigation of the question (using any resource other than other human beings), and written responses. Take home exams will be assigned using the Canvas Learning Management System. Lecturers will evaluate each exam assigning a score of 1 or 0, where 1 = acceptable and 0 = unacceptable.

For discussion-based learning to be successful, students must attend class. Thus, attendance will be factored into the final grade. If a student misses more than three days of class, a point will be deducted from the final total.

One extra point will be assigned to students who complete all lecturer and course evaluations and submit all method inquiries via Canvas.

Final grades will be assigned as follows:

5 or more points = A

3 or 4 points = B

Fewer than 3 points = C

**Recommended Textbook:**

Molecular Biology of the Cell, 6<sup>th</sup> Ed. (Alberts et al) ISBN: 9780815344322

**Course Outline:**

DATE	SESSION TOPICS/ACTIVITIES	LECTURER
8/7/2018	Scientific Communication: Tips and Tricks	Schneider
8/8/2018	Rigor and Reproducibility and Data Management	Redden
8/9/2018	Professional Development, opportunities and resources	Carter
8/10/2018	No Class- Symposium	
8/13/2018	Genome Organization and Elements	Strong
8/14/2018	Mendelian Genetics and Inheritance	Strong
8/15/2018	Methods required for these discoveries	Strong/Schneider
8/16/2018	No class, reading day	
8/17/2018	Discuss review, address questions, and assign	Strong/Schneider
8/20/2018	DNA Replication	Bjornsti
8/21/2018	DNA Repair	Bjornsti
8/22/2018	Methods required for these discoveries	Bjornsti/Schneider

8/23/2018	No class, reading day	
8/24/2018	Discuss review, address questions, and assign	Bjornsti/Schneider
8/27/2018	Transcription, basics	Schneider
8/28/2018	Gene Regulation (at level of RNA synthesis)	Schneider
8/29/2018	Methods required for these discoveries	Schneider
8/30/2018	No class, reading day	
8/31/2018	Discuss review, address questions, and assign	Schneider
9/3/2018	No class, Labor day	
9/4/2018	mRNA modifications (capping, slicing, poly-A)	Zhao
9/5/2018	Translation	Schneider
9/6/2018	Methods required for these discoveries	Schneider/Zhao
9/7/2018	Discuss review, address questions, and assign	Schneider/Zhao
9/10/2018	Regulatory RNAs (RNAi, micro-RNA, lnc-RNA)	Zhao
9/11/2018	RNA modifications (snoRNA, m6A)	Zhao
9/12/2018	Methods required for these discoveries	Zhao/Schneider
9/13/2018	No class, reading day	
9/14/2018	Discuss review, address questions, and assign	Zhao/Schneider
9/17/2018	Graduate School expectations, assumptions, and needs	Schneider

**Disability Support Services:**

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services (DSS) for information on accommodations, registration and required procedures. Requests for reasonable accommodations involve an interactive process and consists of a collaborative effort among the student, DSS, faculty and staff.

**To Register for Disability Support Services** - Contact DSS at (205) 934-4205 (voice) or (205) 934-4248 (TDD). You must present documentation verifying your disability status and the need for accommodations. After DSS receives your completed documentation, you will meet individually with a member of the DSS staff to discuss your accommodations. It is best to register with DSS when you apply to UAB, as it may take 2-3 weeks to review your request and complete the process. For more information about Disability Support Services or to make an appointment, please feel free to contact the office directly at the Hill Student Center, 1400

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University Boulevard, Suite 409, Birmingham, AL 35294; via email: [dss@uab.edu](mailto:dss@uab.edu); or visit their [website](#) for more information.

If you are registered with Disability Support Services, **it is the student's responsibility to contact the course instructor** to discuss the accommodations that may be necessary in this course. Students with disabilities must be registered with DSS and provide an accommodation request letter before receiving academic adjustments. Reasonable and timely notification of accommodations for the course is encouraged and provided to the course instructor so that the accommodations can be arranged. Additional information about the process is available on the UAB [website](#).

## **Title IX:**

The University of Alabama at Birmingham is committed to providing an environment that is free of bias, discrimination, and harassment. If you have been the victim of Sexual discrimination, harassment, misconduct, or assault we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit [UAB's Title IX Policy](#) and [UAB's Equal Opportunity and Anti-Harassment Policy](#).