

GBS 707 – Biochemistry/Metabolism

2 Credit Hours | Fall 2020 | September 28 – October 30, 2020 |

All lectures and discussion are remote, via Zoom. Lectures listed in bold and an asterisk (*) on the schedule indicates that a “live” Zoom lecture will be offered 8a-10a.

Course Director: Dr. Scott Ballinger | scottballinger@uabmc.edu

Course Co-Director: Dr. Shannon Bailey | shannonbailey@uabmc.edu

Course Manager: Jessica Watts | jessicawatts@uab.edu

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 equip and provide students a basic understanding of the principles of biological chemistry, which include the application of these principles to research protocols and performance.

Grading:

Homework (15%): Each week students will be assigned homework questions which include experimental design and/or short answer on the topic. The questions will include material from the entire week of lectures. Students may use outside resources. Homework assignments will be due through Canvas no later than Wednesday at 5pm, each week. During Thursday’s lecture, students will be chosen at random to present their findings and discuss implications to their field of interest. ***These discussions will be live via Zoom, and will be moderated by the lecturer(s).***

Participation (10%): Students are expected to be active participants in each live homework discussion. For effective exchange of information, active discussion and participation are required when homework questions are discussed. ***Any unexcused absence will result in forfeit of participation points.***

Quizzes (75%): Students will complete five closed-note quizzes. Each quiz will consist of a series of multiple choice questions that require the student to remember fundamental aspects of the biological question and synthesize connections between key aspects of the topic(s).

Instructional Method:

Remote: This class will be conducted virtually using a combination of live and recorded content through Canvas, Zoom, and other tools using the Canvas Learning Management system. **Students should reserve the days and hours listed in the Class Schedule for live course elements, determined by the teacher (*indicated by bold font and an asterisk*).** Students will not attend class on-campus.

Teaching Time Zone:

8AM-10AM Central Time [U.S. Official Time Zone Site](#)

Practical Notes:

- GBS 707 will utilize Canvas, UAB's learning management system, for all course material, lectures, and quizzes.
- Recorded lectures will be posted to Canvas week by week, by at least 8PM on Sunday.
- Lecture materials can be viewed asynchronously, throughout the week of the topic.
- ***Application & Implications are required each week for participation credit; these are remote Zoom sessions from 8a-10a, every Thursday.***
- ***Lecturers indicated by bold font and asterisk will give their lecture remotely on the scheduled date via Zoom from 8a-10a.***
- Quizzes will have a 1-hour time limit and must be started between 8AM and 11AM CDT on the Friday of each week.
- Assessment/grading of homework will be completed by individual lecturers and the overall average accessed by the course directors at the end of the course.

Recommended Textbooks/Additional Course Readings:

This course recommends Voet and Voet, "Biochemistry" 4th Edition. John Wiley & Sons, Inc.

Course Outline:

DATE	SESSION TOPICS/ACTIVITIES	LECTURER
9/28/2020	Primary Structure of Proteins & Techniques	Petit/Renfrow*
9/29/2020	Secondary, Tertiary Structure of Proteins & Techniques	Petit/Renfrow*
9/30/2020	Allosteric Proteins and Enzyme Kinetics (HW due by 5PM)	Patel *,#
10/01/2020	Application & Implications (Live discussion, Q&A)	Patel/Petit/Renfrow *
10/02/2020	Quiz #1	Staff
10/05/2020	Carbohydrate Metabolism & Techniques	Hel
10/06/2020	Glycolysis & Techniques	Hel
10/07/2020	Citric Acid Cycle & Techniques (HW due by 5PM)	Wende*
10/08/2020	Application & Implications (Live discussion, Q&A)	Hel/Wende*

10/09/2020	Quiz #2	Staff
10/12/2020	Electron Transport/OXPHOS & Techniques	Bailey
10/13/2020	Mito Dynamics/Biogenesis & Techniques	Rowe
10/14/2020	Mitochondrial Genetics & Techniques (HW due by 5PM)	Ballinger
10/15/2020	Application & Implications (Live discussion, Q&A)	Bailey/Ballinger/Rowe*
10/16/2020	Quiz #3	Staff
10/19/2020	Lipid Metabolism & Techniques	Pollock
10/20/2020	Nucleotide Metabolism & Techniques	Detloff
10/21/2020	Amino Acid Metabolism & Techniques (HW due by 5PM)	Bolisetty
10/22/2020	Application & Implications (Live discussion, Q&A)	Bolisetty/Detloff/Pollock*
10/23/2020	Quiz #4	Staff
10/26/2020	Landmark Papers – Epigenetics	Hidalgo*
10/27/2020	Landmark Papers – Mitochondria	Ballinger*
10/28/2020	Landmark Papers – Metabolism (HW due by 5PM)	Habegger*
10/29/2020	Application & Implications (Live discussion, Q&A)	Ballinger/Hidalgo/Habegger*
10/30/2020	Quiz #5	Staff

* indicates “live” remote Zoom lecture given from 8a-10a

Students are expected to have read Voet and Voet (4th Edn) text book chapters related to “Hemoglobin: Protein Function in Microcosm”(Chapter 10) and “Mechanisms of Enzyme Action” (Chapters 13-14). Alternative resources include watching Khan academy lessons related to Hemoglobin structure and function, Allosteric regulation of Protein function, Chemical Kinetics and Enzyme Kinetics (Michaelis Menten equation).

Additional Information:

Course Director(s):

Drs. Scott Ballinger and Shannon Bailey

Contact Information

Dr. Scott Ballinger | scottballinger@uabmc.edu

Dr. Shannon Bailey | shannonbailey@uabmc.edu

Preferred Methods of Contact:

Email is the preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays and a slower response on weekends (OR Emails received after 5 pm on Friday will be returned Monday morning). Please include course number (GBS707) in the subject line of your email for a faster response. We are available to meet virtually via Zoom by appointment; please contact via email and we can set up an appointment.

Virtual Office Hours: By appointment

UAB Policies and Resources:

Add/Drop and Course Withdrawal

- **Drop/Add:** Deadlines for adding, dropping, or withdrawing from a course and for paying tuition are published in the Academic Calendar available online. Review the Institutional Refund Policy for information on refunds for dropped courses.
- **Withdrawal:** To avoid academic penalty, a student must withdraw from a course by the withdrawal deadline shown in the academic calendar and receive a grade of W (withdrawn). Failure to attend class does not constitute a formal drop or withdrawal.

UAB United: Safe Entry to Campus

- Please go to the UAB United website for guidance and resources related to our safe entry to campus in Fall 2020, including information on:
 - Testing
 - Academic resources and in-depth information
 - Student Affairs resources to support all students (housing, dining, extracurricular activities, parking, etc.)
 - Health and safety resources and recommendations for on and off-campus
 - Information for graduate students, School of Medicine students, Post-Docs and International Students

All students should use the Student COVID-19 Entry Checklist to see what they have to do in order to enter the campus safely. **Non-compliance with the required items will result in students not being able to remain on campus or participate in any in-person classes, meetings, jobs, extracurricular activities, and events.**

Misconduct:

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Students, faculty, and the administration of the institution must be involved to ensure this quality of academic conduct. Review the Academic Honor Code and Non-Academic Student Code of Conduct linked below.

- Academic Honor Code
- Non-Academic Student Code of Conduct

DSS Accessibility Statement:

Accessible Learning: UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) **934-4205**, visit [their website](#), or their office located in Hill Student Center Suite 409.

COVID-19 Adjustments for Students:

Attendance/participation in the “*Application & Implications*” Zoom lectures will be a part of your grade in this course. All absences for COVID-19-related illnesses will be excused. *Any unexcused absence will result in forfeit of participation points.*

Students concerned about their attendance as a result of COVID-19 should register with Disability Support Services. UAB Disability Support Services (DSS) has established a process for UAB students to request temporary adjustments based on the impact of COVID-19. The process is similar to the traditional DSS registration procedures for accommodations based on disability. However, these requests will be referred to as "COVID-19 Related Temporary Adjustments". On the DSS website, there is a section (next to the traditional DSS application process) titled "Request COVID-19 Temporary Adjustments" where students can read the process and click to complete an application.

On the application, the student must complete an attestation and identify which of the following category(s) applies to their situation. Students will be allowed to submit documentation to support their requests.

- I am 65 or older
- My medical provider has determined that I am an individual who is considered high risk according to Centers for Disease Control and Prevention
- I care for or reside with an individual who has been determined to be high risk according to Centers for Disease Control and Prevention
- I have tested positive for COVID-19
- I am requesting adjustments for another reason

Any questions regarding this process should be referred directly to dss@uab.edu. For qualifying students, DSS staff will create a Notification of Temporary Adjustment Letter (PDF format) which will be provided to students. Students will share this letter, as needed, with instructors to request adjustments.

Title IX Statement:

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct 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 Title IX webpage](#) for UAB's Title IX, UAB's Equal Opportunity, Anti-Harassment, Duty to Report, and Non-Retaliation policies.

Mandatory Masks and Social Distancing Requirements:

In accordance with CDC guidelines and for the health and well-being of all faculty, staff and students. Students, faculty and staff are required to wear cloth face coverings or face masks at all times and maintain social distancing (6 feet between individuals in traditional classrooms, or, in instructional laboratories and similar settings) while on the UAB campus. Instructors have the right to ask those who are not complying with these requirements to leave class in the interest of everyone's health and safety. In the event that a student refuses to comply with these requirements, the instructor has the right to cancel class.

Additionally, following other simple practices will promote good health in and out of the classroom, such as frequent and thorough hand washing, wiping down desks and seats with disinfectant wipes whenever possible, not sharing personal items such as pens and cell phones, and avoiding crowded areas and other enclosed spaces.

The UAB Blazer community views the adoption of these mandatory guidelines as a mark of good citizenship and respectful care of fellow classmates, faculty, and staff. Please visit the [UAB United website](#) for further information.

Food may not be consumed during class times in classrooms, but bottled water is permissible.

GuideSafe Event Passport Class Requirement:

Faculty are required to verify all students who are present for in-person instruction have a current Event Passport.

The COVID-19 pandemic is an extraordinary situation requiring significant measures to create a safe educational community. UAB is using GuideSafe™ Event Passport to facilitate access to classrooms, meetings, events, or facilities having ten or more people. Attendees, including faculty, staff, and students, will complete [UAB Healthcheck](#), a COVID-19 assessment tool, prior to entering their event. An Event Passport is issued based factors from your daily risk level as assigned by the UAB Healthcheck. After you have completed Healthcheck, press the "Passport" button to get your passport. This passport is good for 24 hours. Remember your passport number to access your passport later in the day. Each user is assigned a unique passport number indicating their status for the upcoming event that will show a "Clear" (Green) screen or "Not Clear" (Red) screen. After the 24-hour passport has expired, you will need to complete Healthcheck again. Each passport will have a time and date to ensure validity. Learn more at [UAB GuideSafe Event Passport](#).