



MCB 493 PDE: Physiology of Diet and Exercise Lab Spring 2026

Course Information

- **Course Duration:** Full Semester
- **Contact Hours:** Wednesdays 1:00 – 4:50 PM
- **Course Location:** Burrill Hall 485C
- **Credit Hours:** 2
- **Course Website:** <https://canvas.illinois.edu/>

Instructor Information

- **Dr. Jacob Beal**, Postdoctoral Fellow, Interdisciplinary Environmental Toxicology
- **Instructor contact information:** jbeal2@illinois.edu
- **Instructor drop-in hours for students:** Wednesdays after class

- **Teaching Assistant (TA):** Xiangning Song
- **Teaching Assistant contact information:** xs38@illinois.edu

Course Description

This is an advanced laboratory course designed to study fundamental physiology concepts including full body metabolism, endocrine signaling, and neural, muscular, and cardiovascular systems using hands-on experiments with mice and computer simulations. Students will measure and analyze how diet and exercise impinge on the response elicited from these different systems using a calorimeter, analyzing blood glucose and hormone levels, testing for stress/anxiety, and measuring heart rate and muscle contraction. In addition, the goals of the course also include facilitating a student-driven experimental design, testing and analysis process.

Learning Outcomes

At the end of the course, through assignments, discussions, activities and assessments, students will be able to:

- Have an understanding of the interplay between metabolism and health.
- Have an understanding of the integration between dietary intake and exercise and their cumulative effects on health and metabolism.
- Have an understanding of how to formulate a scientific hypothesis, construct the appropriate tests and models and evaluate the results.

Prerequisites, Requirements met (general education, major, minor)

Credit in MCB 252 and MCB 253. This class satisfies the advanced MCB lab requirement for the MCB major.

Course Materials

Laboratory Exercises for MCB 493 PDE: Physiology of Diet and Exercise Laboratory, Spring 2026" Edited by: Deb Bielser and Chester Brown, Stipes Publishing
Available at Illini Union Bookstore

Course Requirements and Policies

Grading Breakdown

Instructional Activity	Occurrences	Point Value	Total Points
Pre-lab Assignment	9 (drop 1)	15	120
In-lab Participation	9 (drop 1)	25	200
Post-lab Assignment	9 (drop 1)	30	240
Journal Club Presentation	1	50	50
Lab Practical	1	25	25
ACP Training	1	15	15
Midterm Exam	1	125	125
Final Presentation	1	100	100
Final Report	1	125	125
Total			1000

Final Letter Grades/ Grading Scale

Points	Letter Grade
980 – 1000	A+
930 – 979	A
900 – 929	A-
870 – 899	B+
830 – 869	B
800 – 829	B-
770 – 799	C+
730 – 769	C
700 – 729	C-
670 – 699	D+
630 – 669	D
600 – 629	D-
599 and below	F

Course Schedule/Outline

Week	Topic	Assignments
Week 1 (January 21 st)	Introduction to MCB 493 PDE	ACP Training: Due Jan 27 th 11:59 PM Week 2 Pre-lab: Due Jan 27 th 11:59 PM
Week 2 (January 28 th)	Mouse Handling and Dietary Studies	Week 2 Post-lab: Due Feb 3 rd 11:59 PM Week 3 Pre-lab: Due Feb 3 rd 11:59 PM
Week 3 (February 4 th)	Physiological Control of Feeding Behavior	Week 3 Post-lab: Due Feb 10 th 11:59 PM Week 4 Pre-lab: Due Feb 10 th 11:59 PM

Week	Topic	Assignments
Week 4 (February 11 th)	Impact of Thyroid Hormone on Basal Metabolic Rate	Week 4 Post-lab: Due Feb 17 th 11:59 PM Week 5 Pre-lab: Due Feb 17 th 11:59 PM
Week 5 (February 18 th)	Physiology and Pharmacology of Smooth Muscle	Week 5 Post-lab: Due Feb 24 th 11:59 PM Week 6 Pre-lab: Due Feb 24 th 11:59 PM
Week 6 (February 25 th)	Effect of Diet and Exercise on Flexible Memory	Week 6 Post-lab: Due Mar 3 rd 11:59 PM
Week 7 (March 4 th)	Review for Midterm Exam	
Week 8 (March 11 th)	Midterm Exam	Week 9 Pre-lab: Due Mar 24 th 11:59 PM
(March 16 th – March 20 th)	Spring Break	
Week 9 (March 25 th)	Effect of Diet and Exercise on VO ₂ and VCO ₂	Week 9 Post-lab: Due Mar 31 st 11:59 PM Week 10 Pre-lab: Due Mar 31 st 11:59 PM
Week 10 (April 1 st)	Effect of Diet and Training on Exercise	Week 10 Post-lab: Due Apr 7 th 11:59 PM Week 11 Pre-lab: Due Apr 7 th 11:59 PM
Week 11 (April 8 th)	Effect of Diet and Exercise on Glucose Tolerance	Week 11 Post-lab: Due Apr 14 th 11:59 PM Week 12 Pre-lab: Due Apr 14 th 11:59 PM

Week	Topic	Assignments
Week 12 (April 15 th)	Effect of Diet and Exercise on Insulin Response	Week 12 Post-lab: Due Apr 21 st 11:59 PM
Week 13 (April 22 nd)	Presentation Preparation	
Week 14 (April 29 th)	Final Project Presentation	
Week 15 (May 6 th)	Final Project Presentation (if necessary)	

Additional Course and Campus Policies

Absence Policy

1. Regular class attendance is expected of all students at the University.
(<https://studentcode.illinois.edu/article1/part5/1-501/>)
2. If you find yourself ill, you must submit confirmation of a visit with a medical practitioner within 24 hours of your absence. The confirmation cannot be provided by a relative, even if the relative is a practitioner.
3. The Office of the Dean of Students will only provide informative letters to instructors for protracted illness of 3 or more days, certain emergencies and to be present during the serious illness of immediate family members (parents, legal guardian, spouse/partner, siblings, children, or grandparents). These letters do not excuse you from class but merely provide information for the instructor to consider regarding excusing the absence and permitting make-up work. Students must request absence letters from the Office of the Dean of Students after the student has returned to class but not more than 10 business days after the last date of absence.
4. Absences that may be excused without a letter include circumstances beyond the student's control such as medical treatment, surgery related to prolonged illness or injury, pregnancy, legal matters, citizenship or naturalization processes, or acts of nature which cause destruction to a primary residence or disrupt air travel. All will require documentation.
5. Absences that may also be excused without a letter from the Dean of Students Office include a conference or job, graduate or professional school interviews, though a best effort should be made to schedule these events to minimize class attendance disruption. All will require documentation.

6. Absences that will not be excused include family events such as reunions or weddings, or presence during serious illness of extended family members (aunt, uncle, niece, nephew, or cousin).
7. Absences, when they occur after the first day of classes but prior to enrollment in the course, will require the use of dropped assignments if applicable.
8. Absences will be handled according to individual course policy.
 - A. Attendance will be recorded at every class. Students are required to be present within the first five minutes of class, remain present for the entire class period, and be an active participant to receive credit. Students who are more than five minutes late may forfeit a portion of the points for that period at the instructor's discretion, but they may stay for the class period. Students who are present but are not engaged also may forfeit their points for the day at the discretion of the instructor.
 - B. We know that students become ill and other reasons beyond a student's control arise. To accommodate absences due to minor illness or emergency, we allow that a specified number of assignments may be missed without penalty. These missed assignments can be dropped according to the criteria set forth in the Course Policies for this course. Specifically, for MCB 493 PDE, a student that misses class/assignments due to minor illness (less than 3 days), chooses not to attend class or complete an assignment, and/or forgets to attend class or complete an assignment will use these specified drops. There is no distinction made between illness and missing class/assignments.
 - C. If you experience an illness (chronic, recurring or lasting three days or more) or other circumstance that causes an extended absence from class (lasting three days or more), please contact the Connie Frank CARE Center in the Office of the Dean of Students during business hours (8:30 AM – 5:00 PM). This office is located on the 3rd floor of the Turner Student Services Building, 610 E. John Street, Champaign, 217-333-0050. A representative of that office will provide us with the necessary information to address your circumstance. Please fill out an online absence form for your course which can be found on the course LMS or at this address: <https://apps.atlas.illinois.edu/MCB/McbAbsence>

Academic Integrity

The University of Illinois Urbana-Champaign *Student Code* should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/>.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy:

<https://studentcode.illinois.edu/article1/part4/1-401/> . Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Students with Disabilities

The University of Illinois Champaign-Urbana, is committed to ensuring that all students, including students with disabilities, do not experience barriers to learning and participating fully in class. Students who have a letter of accommodation from DRES are advised to share that with instructors as soon as possible to ensure accommodation needs can be discussed and met.

To obtain disability-related academic accommodations, disabled students must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, please visit 1207 S. Oak Street, Champaign, call 217.333.1970, email disability@illinois.edu, or visit the DRES website.

Family Educational Rights and Privacy Act (FERPA)

See <http://registrar.illinois.edu/ferpa> for more information on Family Educational Rights and Privacy Act (FERPA).

Mental Health

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Health Service Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- Counseling Center (217) 333-3704
- McKinley Health Center (217) 333-2700
- National Suicide Prevention Lifeline (800) 273-8255
- Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

*This statement is approved by the University of Illinois Counseling Center

Community of Care

As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regard to their well-being or yours, we encourage you to refer this behavior to the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students. You may do so by calling 217-333-0050 or by submitting an [online referral](#). Based on your report, staff in the Connie Frank CARE Center will reach out to offer support and assistance.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the [Connie Frank CARE Center](#) (formerly the Student Assistance Center) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

Disruptive Behavior

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office for Student Conflict Resolution (<https://go.illinois.edu/ReportMisconduct>; conflictresolution@illinois.edu; 333-3680) for disciplinary action.

Emergency Response Recommendations

Emergency response recommendations and campus building floor plans can be found at the following website: <https://police.illinois.edu/em/run-hide-fight/>. I encourage you to review this website within the first 10 days of class.

Religious Observances

It is the policy of the University of Illinois Urbana-Champaign to reasonably accommodate its students' religious beliefs, observances, and practices that conflict with a student's class attendance or participation in a scheduled examination or work requirement, consistent with state and federal law. Students must make requests for accommodation in advance of the conflict to allow time for both consideration of the request and alternate procedures to be prepared. Requests should be directed to the

instructor. The Office of the Dean of Students provides an optional resource on its [website](#) to assist students in making such requests.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including supportive measures, resources, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Veterans and Military Students

As a military-friendly institution, and per federal regulations and Illinois statutes, the University of Illinois Urbana-Champaign has established policies and procedures to accommodate military-connected students. In addition to the support available at the Chez Veterans Center (<https://chezveteranscenter.ahs.illinois.edu/>), members of the National Guard or Reserves and active-duty military personnel with military obligations (e.g., deployments, training, drills) are encouraged to communicate these, in advance whenever possible, to the instructor. The policy for Excused Absences and Departure from the University for U.S. Military or other U.S. National Defense Services can be found at <https://studentcode.illinois.edu/article3/part3/3-313>.