



BIOL 121 Biological Concepts Lab

Cells, Metabolism, and Genetics

Generic Syllabus

Section _____

*****Things may change depending on COVID-19 protocols. Currently, masks and social distancing will still be required, and modalities may change.*****

Biology 121 is an introductory laboratory that emphasizes the experimental aspects of cellular organization and processes, metabolism, DNA structure and replication, and Mendelian genetics. This course fulfills the Science/Mathematics (D.1.) general education requirement and the Colonnade requirement (1C). It will help you attain an understanding of the scientific method and knowledge of natural science and its relevance in our lives.

Course Objectives

- Explain the philosophy of science focusing on: what qualifies as science, the reliability of scientific theories, and the ultimate purpose of science
- Construct a testable hypothesis, design valid and reliable experiments, and evaluate data using quantitative analysis, including statistical techniques and graphical representation
- Assess the legitimacy of various sources of information and identify peer-reviewed sources
- Disseminate research findings through construction and presentation of technical reports, scientific posters, and by contributing to an online molecular database
- Appraise the quality of a scientific research conducted by peers
- Demonstrate proficient knowledge of the following essential concepts in biology: macromolecules, diffusion and osmosis, cell signaling, cellular respiration, photosynthesis, DNA structure and function, gene conservation and expression and DNA analysis
- Use common laboratory equipment and perform common laboratory techniques successfully
- Become acquainted with the faculty in Biology Department at Western Kentucky University

Technology in the Classroom



You will be doing research in lab. Please bring your laptop with you every day. You **MUST** have the Microsoft office suite downloaded on your laptop, the online version is insufficient. You can access a free download here: https://www.wku.edu/its/sms/microsoft_sa.php



Cell phones are an integral part of modern day life. We will use them regularly in lab, so please bring them with you. Make sure the ringer is always off, be respectful and reasonable, and do not use them unless instructed to do so.



Please download the free Acadly app. You will receive an email with directions on how to join this course. Alternatives will be available for those without smartphones. Or your instructor may decide on a different method for attendance.



Blackboard

Use Blackboard to access: grades, assignments, course documents, the e-book, and Mastering Biology content. All homework not submitted through Mastering will be submitted through Blackboard. I will post announcements here which will also forward to your WKU email address.

Textbook Information

DO NOT purchase a lab manual from the bookstore. We will be using a new, free, online lab manual @ <http://www.121cellmetagen.com>.



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Section _____

Connection to BIOL 120 Lecture

BIOL 121 is designed to help you understand the content from lecture by **DOING** science in the lab. The course schedules are lined up and lab content will be either just ahead or just behind lecture for the most part. In the manual, at the end of each lab, you will see specific chapters and sections from your BIOL 120 text that align with the lab.

An Inquiry-Based Approach

BIOL 121 uses an inquiry-based approach to engage students in an authentic scientific discovery process. This approach allows students to follow methods and practices similar to those of professional scientists in order to construct knowledge. Review the comparison below and expect to notice some difference from a traditional lab setting in BIOL 121!

| Traditional Lab | Inquiry-Based Lab |
|---|---|
| <ul style="list-style-type: none">• Starts with content-based lecture• Students follow set directions• Students test pre-determined hypothesis• Everyone gets the same “answer”• Student questions are answered by instructor | <ul style="list-style-type: none">• Content delivered in Pre-Lab exercises• Students construct experimental methods• Students develop their own research questions• There is no set “answer”• Students are guided to find answers |

Laboratory Attendance Policy (Valid Until 3/23)

Attendance at laboratories is **MANDATORY**. In the case of a university-recognized excuse, the student is allowed to make up a missed assessment. Without a university-recognized excuse, the student will not receive participation or assessment points. Regardless of missed labs, the student is still responsible for all covered content on the exams. If you miss or know that you will miss your regularly scheduled lab, you should:

1. Find another lab section to attend during the same week (listed on Blackboard). Materials are only available for the week of each laboratory, so **make-ups must occur during the same week**.
2. Download and complete the Make-Up Lab Request Form (on Blackboard).
3. Attach documentation of university recognized excuse (death in family, accident, doctor's note, etc.).

Changes due to new Online Format (Valid Starting 3/23)

- We will be skipping Lab 9 to make up for the extended Spring Break.
- During this on-line period, students can decide to continue working in their groups, or they can work with a partner or alone, whichever options fits their needs best.
- The in-lab protocols for each week will be revised to include on-line activities.
- Lab Notebook Guides will be revised to reflect the online lab components.
- Your instructor will generate data tables using existing data for students to use to complete Lab Notebook Guides, analysis and posters.
- Each section will have a discussion forum available to students so questions and answers can be shared.

Online Access & IT Help

- Spectrum is offering free installation and free wi-fi! Installation fees will be waived for new student households. It also said it would open its Wi-Fi hotspots for public use. To enroll in the program, call 1-844-488-8395.
- If you need a laptop to work from home, WKU can help! Visit TopperTech at [THIS LINK](#) to request a loaner laptop!



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Generic Syllabus

Section _____

Grades

100 - 90% (A), 89 - 80% (B), 79 - 70% (C), 69 - 60% (D), 59% - or lower (F): 580 total points
Students will be graded like normal, but at some point following the semester the students will be given 7 days to decide if they want all their classes to be A-F or all their classes credit/no credit in which credit would include A-D grades

Online Syllabus & Safety Quiz = 20 points: Before we meet for our first class during week 2, you must review our syllabus (on Blackboard) and content on Lab Safety (in our online manual). You must then complete the Online Syllabus & Safety Quiz in Blackboard. It is 20 questions long and worth 20 points. Unlike the remaining quizzes, you can take this quiz as many times as necessary before the due date. You will not be allowed to begin our first in-class lab without a perfect score on this quiz.

Lab Participation: 5 points for each lab = 55 points. These points are based on attendance and engagement in lab and are up to the discretion of your instructor. They may or may not be included.

LABridges: 12 (15pt/ea) = 180 points. Each week you will complete a LABridge on Blackboard. During these assessments you will submit your notebook entry from the last lab AND you will be tested on the Pre-Lab content for next lab (hence, the "bridge"). LABridges are timed (20m). You cannot backtrack to questions you answered previously. You cannot re-take or re-submit them and you cannot submit them late.

- **E-Note Books:** You will be keeping an electronic lab notebook throughout BIOL 121. In each lab you will have a "Notebook Guide" which serves as a template for each notebook entry. Be sure your notebook entry is ready for submission BEFORE you attempt to complete the LABridge for that week.
- **Pre-Labs:** You must prepare for each lab so we all get started as soon class begins. The Pre-Labs in our e-manual are designed to ensure you have the background knowledge necessary to have a successful lab each week. Read them closely and follow the directions carefully BEFORE you attempt to complete the LABridge for that week.
- **Conclusion LABridge:** Will be your final LABridge. In it, you will submit your final Lab Notebook Guide and complete the BIOL 121 Colonnade Assessment = 5 points. This assessment is part of the WKU Colonnade framework. It is mandatory, and you can take it as many times as you see fit.

Research Projects: Two 100-point projects = 200 points. You will complete a technical report in Unit 1 and a Scientific Poster in Unit 2. Both will be submitted on Blackboard. Late assignments, paper assignments, or incomplete assignments will not be accepted. You must submit your assignments in Word only. Assignments will not appear on Blackboard past the submission date/time.

Practical Assessment Exam = 100 points. Assessment will include practical and written components. Exams cannot be re-taken or rescheduled without a documented, university-recognized excuse.

Peer Assessment = 25 points. You will conduct a peer evaluation of your lab partners at the end of the semester. Your total points will be the mean of the scores given by your partners. Reviewers will be anonymous to the reviewee.

Pre and Post-Course Student-Surveys. These are quick and simple survey questions designed to help us create a better learning experience for you. Please take the time to answer honestly. Announcements will be made regarding availability.



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Lab Schedule & Assignments

| Unit | Lab | Due Before Lab |
|---|--|---------------------------------------|
| Cells: The Public Health Epidemic of Diabetes | Lab 1: Diabetes Data | Syllabus and Safety Quiz & LABridge 1 |
| | Lab 2: Glycemic Index & Macromolecules | LABridge 2 |
| | Lab 3: Hypothesis Testing w/Correlation | LABridge 3 |
| | Lab 4: Diffusion, Osmosis & Cell Signaling | LABridge 4 |
| | Lab 5: Report Critique & Research for Unit 2 | LABridge 5 & Lab Report Draft |
| Metabolism: What factors affect energy acquisition? | Lab 6: Research Proposals | LABridge 6 & Lab Report Final |
| | Lab 7: Crayfish & Respiration | LABridge 7 |
| | Lab 8: Photosynthesis | LABridge 8 |
| Genetics: The Bushmeat Crisis in Kenya | Lab 10: Extraction & PCR | LABridge 10 & Scientific Poster Final |
| | Lab 11: Gel Electrophoresis | LABridge 11 |
| | Lab 12: Sequencing & BLASTing | LABridge 12 |
| Comprehensive Online Exam | | Conclusion LABridge & Peer Assessment |
| No Lab - Finals Week | | |

Due Dates & Times: Before your Lab each Week

You must turn in your own work! Even though you will be working with your lab group, everyone is responsible for their own submissions. All assignments are due BEFORE your lab begins each week. **They are due the DAY and HOUR of your lab.** For example, if your section meets Tuesdays at 10:20, all your LABridges and other assignments are due Tuesdays by 10 AM. If your section meets Wednesdays at 12:40, everything is due Wednesdays by 12 PM.

What is **your** due day and time? _____



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Frequently Asked Questions

I MISSED AN ASSIGNMENT OR AN EXAM. WHAT DO I DO?

*Assignments are NEVER accepted late or for “partial credit” without a documented university recognized excuse. Make-up exams are **ONLY, EVER** available for students who make contact BEFORE the exam with a documented university recognized excuse (e.g., doctor’s excuse, accident report, court date, military service, etc.).*

DO YOU GIVE EXTRA CREDIT?

Not to individuals. Occasionally, extra credit may be offered to the class as a whole.

IS IT TOO LATE TO DROP OR WITHDRAW FROM THIS CLASS?

February 3rd is the last day to add a class, last day to drop a class without a grade, and the last day to receive 100% refund. April 9th is the last day to drop a class with a “W.”

DO I HAVE TO DROP LAB AND LECTURE TOGETHER?

Yes. This is a co-requisite for BIOL 120. Lab and lecture must be enrolled in and dropped together. If you fail on or the other, however, you do not have to retake BOTH.

MY FINAL GRADE IS ALMOST AN A, OR B, OR C, ETC...WHAT CAN I DO?

Nothing. By the end of the semester your grade is what it is. If you have 89.5, I will round to an A. If you have an 89.4, you will have a B, and so on. Please do not EVER email your college professors asking for your grade to be rounded up or points to be added. INSTEAD, begin the semester with the end in mind. You don’t want to look back and say, “if I’d only gone to one more class or done one more assignment, I could have the grade I want/need to move on.

LAB MANUAL VIDEOS (MEDIA SITE) WILL NOT WORK!

Please be sure you are using Chrome. Then check with a lab mate to see if they are also experiencing a problem. If so, email Dr. Mountjoy @ natalie.mountjoy@wku.edu. If not, and the problem is specific to your device or connection, please contact WKU IT for help @ <https://www.wku.edu/its/service-desk>.

I CANNOT FIND WHAT I NEED IN BLACKBOARD!

First, check with a lab mate to see if they are also experiencing problem. If so, email your concern to your instructor. Occasionally, the availability functions in Blackboard can be temperamental.

I NEED A LAPTOP!

You have options! You can borrow one from the WKU library (<https://apps.wku.edu/trc>) or go through SGAs “Earn a Computer” program (email Dr. Mountjoy for details @natalie.mountjoy@wku.edu).



BIOL 121 Biological Concepts Lab Cells, Metabolism, and Genetics Generic Syllabus

Section _____

Attendance: The faculty and staff of Ogden College of Science and Engineering are committed to providing you with learning experiences and opportunities. You must assume ownership of your education and be an active participant in the classroom and laboratory to take advantage of these opportunities. **Active participation requires you to attend.** Scientific studies have shown that attendance during scheduled classroom and laboratory meetings is directly correlated to your performance on assignments and exams and the potential to earn higher grades. Additionally, if you do not regularly attend class, you are missing important information about course topics, due dates, and assignment details that are crucial to your success in the course. Therefore, as a student enrolled in an Ogden course, you are expected to attend every class meeting and to inform your instructor regarding the reasons for any absences as soon as practical. Your instructor may incorporate class attendance/participation as part of the grading criteria.

Student Accessibility: In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

Academic Integrity & Student Conduct: It is expected that each student will do his/her own work at all times. Therefore, cheating/academic dishonesty in any form (plagiarism, altering exams, crib sheets, cell phone usage, etc.) will result in dismissal from the course with a grade of 'F', and this policy will be strongly enforced. Student behavior or speech that disrupts the instructional setting or is clearly disrespectful to the instructor or fellow students will not be tolerated in the Biology 123 laboratory. Disruptive conduct may include but is not limited to:

1. Rude or disrespectful behavior
2. Unwarranted interruptions
3. Failure to adhere to instructor's directions
4. Vulgar or obscene language, slurs, or other forms of intimidation
5. Physically or verbally abusive behavior
6. Inappropriate questions or advances toward your instructor

Any continuation of such conduct or actions will result in disciplinary action as specified in the WKU Code of Conduct.

Sexual Misconduct, Discrimination & Harassment: Western Kentucky University (WKU) is committed to supporting faculty, staff, and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at <https://wku.edu/eoo/documents/titleix-/wkutitleixpolicyandgrievanceprocedure.pdf> and Discrimination and Harassment Policy (#0.2040) at https://wku.edu/policies/hr_policies/2040discrimination_harassment-policy.pdf. Under these policies, discrimination, harassment, and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment, and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender based discrimination, harassment, and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and **MUST** report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

The Learning Center: The Learning Center (DSU 2141) provides free supplemental education programs for all currently enrolled WKU students. TLC offers CRLA Certified, one-on-one tutoring in over 100 general education subjects by appointment or walk in and hosts a branch of the English Department's Writing Center. TLC also provides quiet study area, with side rooms designated for peer to peer tutoring, and offers a computer lab. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745 - 5065 or log on to the website at <https://www.wku.edu/tlc>. More detailed information about University policies and services related to students is available at <https://www.wku.edu/syllabusinfo/index.php>

Food Insecurity: Food insecurity is defined as a condition where persons, in this case students, do not have adequate resources to feed themselves, either nutritiously or not at all (USDA, 2013). According to a recent national study (Hunger on Campus, 2016), food insecurity is common at colleges and universities across the country, potentially undermining the educational success of untold thousands of students. If food insecurity is an issue for you or someone you know, help is readily available. Contact the WKU Office of Sustainability at (270) 745-2508 or email sustainability@wku.edu or visit starvingtolearn.com.