

Biology 121 – Biological Concepts Laboratory: Cells, Metabolism, and Genetics

Course Location: Snell Hall 2102

Faculty Supervisor: Bruce Schulte (TCCW 359; bruce.schulte@wku.edu)

Laboratory Coordinator: Mark Clauson (SH 2103)

Lab Instructor: Nathaniel Zbasnik (nathaniel.zbasnik527@topper.wku.edu)

Lab Manual: The laboratory manual (**Biological Concepts- Fall 2018**) can be purchased at University Text Book and Supply or at the WKU Store the week before classes begin.

Course Description:

Biology 121 is an introductory laboratory that emphasizes the experimental aspects of cellular organization and processes, metabolism, DNA structure and replication, and Mendelian genetics. Since lab investigations illustrate, complement, and supplement material presented in Biology 120 lecture, this lab course should be taken concurrently with the lecture. Emphasis in this lab course is on learning-by-doing.

Colonnade Statement: This course fulfills the 1C Colonnade requirement. It will help you attain this colonnade goal: *An understanding of the scientific method and knowledge of natural science and its relevance in our lives. Specifically: - how scientific knowledge is created, developed, and changed through experimentation and reasoning, and - demonstration of knowledge in one or more of the sciences including theories, concepts, and principles that explain observations and make predictions.*

Course Objectives: Upon completion of the course you should be able to:

- *Explain the process of scientific inquiry and the importance of using controls in scientific experiments.
- *Use common laboratory equipment successfully.
- *Perform common laboratory techniques; appreciate the limitations of the techniques, and explain the purpose of each of the techniques.
- *Record experimental data, represent data, analyze and interpret data, and draw appropriate conclusions based upon data.
- *Demonstrate an understanding of the characteristics of living organisms including their chemical composition, cellular structure, cellular division, genetics, and metabolism.

Activities by Which You will Learn Objectives:

- *Attending and actively participating in the laboratory each week.
- *Reading/reviewing laboratory instructions detailed in your laboratory manual.
- *Completing all laboratory experiments and assignments.

Preparation for lab:

You must read the lab manual before coming to class each week. Reading the lab beforehand will allow you to spend your time in lab focusing on the results of the experiments instead of trying to figure out how to do the experiments. Reading the manual before lab will also be necessary for the weekly quiz (see below).

Additional Laboratory Rules:

Goggles are required for all labs involving liquids that could splash in your eyes. Please have goggles by the second day of lab.

No gum, food, drinks, or tobacco products are allowed in the laboratory at any time.

No bare feet.

Cell phones, laptops, and other electronic devices must be turned off and stowed away for the ENTIRE duration of the lab.

If you are observed with a cell phone during the lab period, you will lose participation points. If you are observed with a cell phone during a quiz or exam it will be assumed that you are using the cell phone to cheat. See the consequences for cheating below under Academic Integrity.

GRADING:

Lab Participation: (40pts)

Laboratory attendance is mandatory and you must arrive on time and participate in the lab exercises. Quizzes are given at the beginning of the lab, and you will not be allowed to take the quiz if you arrive after the quiz has been completed. In addition, if you leave the classroom before the laboratory has been completed, you will lose the participation points for that lab period. If you attend all lab sessions and participate in all lab exercises, you will be awarded 40 points. If you miss a regularly scheduled lab with an unexcused absence you will lose participation points for that lab period and you will not be able to make up the missed quiz. Excused absences need to be reported to the instructor immediately so arrangements will be made (usually in the form of an extra assignment to make up points). **Any student missing more than two labs (for any reason) will be counted absent, will lose participation points as stated above, and will not be allowed to make up quizzes or missed assignments.**

Assignments (50pts): There will be assignments given periodically throughout the semester by your TA – the total value of the laboratory assignments will be 50 points. Your lab instructor will determine the value of each individual assignment. Assignments that are turned in after the stated due date will be assigned a grade of zero.

Safety Quiz (5pts): Must be completed and turned in to your instructor by the second week of lab.

Colonnade Assessment (5pts): Online assessment will be available at the end of the semester and must be completed prior to the beginning of finals week.

Weekly Quizzes (10 x 10 =100 pts): There will be a short, 10 -point quiz in the first 10 minutes of each lab (with the exception of the first lab, the day of the midterm, and the day of the final). Five points on the quiz will cover information from the previous lab, and five points on the quiz will cover information for the lab that will be performed that day.

Exams (100pts X 2): There will be two exams covering the laboratory material from the first and second halves of the semester. Each exam will be worth a total of 100 points. The exams will consist of a 20pt practical plus an 80pt written portion. Make-up examinations will be given at the discretion of the instructor, usually only in the case of serious illness or death in the family.

Total Possible Pts: 400

Grading Scale:

A = 90-100% B = 80-89.9% C = 70-79.9% D = 60-69.9% F = < 60%

*Grades are earned by the student, not given by the instructor. Your instructor will assign the grade that you have earned in the course.

*Due to the Family Educational Rights and Privacy Act (FERPA), if you are 18 years old or older, I cannot discuss your grades etc. with your parents.

ACADEMIC INTEGRITY: 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, copying, etc.) will not be tolerated – violators will be reported to Judicial Affairs and the **minimum** penalty will be a grade of zero for the exam or assignment. It is more likely that you will be assigned a failing grade for the course. Cheating can also result in your expulsion from the university. The WKU student conduct code can be seen at: http://wku.edu/judicialaffairs/?page_id=70

LATE WORK: No late work will be accepted unless there is a university or doctoral excuse for why the work was missed or is late.

STUDENT DISABILITIES SERVICES: In compliance with university policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Office for Student Disability Services in Downing University Center, A-200. The phone number is 270-745-5004. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.

THE LEARNING CENTER: The Learning Center (DUC A330) 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 a hosts a branch of the English Department's Writing Center. TLC is a also a quiet study area, with side rooms designated for peer to peer tutoring, and offers a thirty two machine computer lab. Additionally, TLC has two satellite locations, one each in Douglas Keen Hall and in Pearce Ford Tower that provide computer and print service, tutoring, and quiet study areas. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745 - 6254 or log on to the website at <https://www.wku.edu/tlc/>

LABORATORY SCHEDULE

Important Dates:	Lab	Topics
Jan 2	1	Introduction + Metric system, Measurements, Graphing, Data Analysis
	2	Biological Molecules - I. Chemical Analysis of Food
	3	Biological Molecules - II. Proteins and Nucleic Acids
	4	Biological Membranes - Diffusion/Osmosis
	5	Properties of Enzymes - Biological Catalysts
Jan 9	MIDTERM EXAM (100pts)	
	6	Cellular Respiration
	7	Photosynthesis
	8	Cell Cycle, Mitosis, Cancer
Jan 15	MLK Day - No Labs	
	9	Mendelian Genetics
	10	Polymerase Chain Reaction / Agarose Gel Electrophoresis

Jan 18

Study Day – No Labs

Jan 19

FINAL EXAM

Final notes from your instructor: This is a summer course. As mentioned previously, attendance is mandatory, but it is even more important during the summer than during a regular semester. This will be incredibly fast-paced, as we are going to cover a week's worth of material every day. Be sure to stay on-task with your work and studies, and if you are having any issues, please email me as soon as they arise. My email is provided on the first page of this syllabus. Catching up when behind is not going to be easy.

It is important to realize that a lab setting is much different than a lecture learning environment. In a lecture, information is 'thrown' at you that you are expected to process, but it has already been formatted into an 'easily-digestible' form. This is not true of lab. The hands-on learning experience involves you getting your hands dirty, figuring out the problem, and **figuring out what the results of your experiment mean**. Interpretation is an important step of the scientific process. In that regard, my role as lab instructor is not to lecture at you, or to tell you the answers, but to help you along the process of interpreting the results for yourself. I am more than happy to answer any questions you may have, always. **Comprehension of the "WHY" is the key to success in this lab, on both quizzes and exams.**