

BIOB 161 Syllabus Summer 2018

Principles of Living Systems Laboratory

Course Information:

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Office Hours: Announced in Class

Lab Section meeting times in Natural sciences 203:
BIOB 161N-01 TWR 1:00pm-2:50pm

General Course Information:

During this course, we will cover the unifying principles of biological structure-function relationships at different levels of organization and complexity. Lab experiences illustrate biological principles underlying growth, reproduction, development, genetics and physiology.

Principles of Living systems is a broad survey course that is a prerequisite for all options in the Biology and Wildlife majors and is generally required for all pre-professional programs in the health sciences. The content of this course will provide foundational knowledge for future studies in Cell and Molecular Biology, Genetics and Evolution, Developmental Biology, Anatomy and Physiology, Ecology, and related options.

Course Goals:

Upon successful completion of this course, you will have a broad knowledge of biology including cell and molecular biology, genetics and evolution, development biology, physiology, and ecology. You will also have a better understanding of the scientific method and the means by which scientific discoveries shaped our current understanding of biology.

Course Objectives:

- 1) Gain an appreciation for how science works and how the scientific method increases our understanding of biology.
 - 2) Gain an appreciation of biological concepts from the most basic macromolecules syntheses to the diversity of living systems.
 - 3) Understand how biological systems work to maintain homeostasis.
 - 4) Use critical thinking skills to predict the consequences of homeostatic imbalances.
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Course outcomes:

- 1) Demonstrate understanding of chemical and biological principles and knowledge.
- 2) Understand and analyze cellular processes governing development, growth and normal function of living organisms.

- 3) Understand the processes involved with maintaining homeostasis in living organisms and anticipate what may occur when homeostatic balance mechanisms are lost.
- 4) Demonstrate practical knowledge of basic chemistry, biological molecules, cells, membranes, energy and metabolism, the cell cycle, evolution and ecology.
- 5) Identify biological molecules and structures and analyze their relationship with other structures.
- 6) Practice the scientific method by making predictions, performing biological experiments and interpreting results, and determining the potential biological consequences.

Course Information:

Teaching methods: Laboratory

Student Responsibilities:

- 1) Students are expected to complete the required reading and pre-laboratory assignments prior to class meeting times.
- 2) Students are expected to log on to the course Moodle site regularly to download course materials and read updated course announcements.
- 3) Regular attendance in lectures and laboratory is strongly recommended for successful completion of the course.
- 4) If absence from lecture or laboratory is necessary due to illness, it is your responsibility to obtain notes from another student.
- 5) Students are expected to be respectful during all course meetings and during meetings with course staff and Dr. Minns. Students who fail to do so will be subject to the student conduct code.

Recommended Course Materials Information:

Campbell BIOLOGY, 11/e Jane B. Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Robert W. Jackson ISBN-13: 9780321775849

** If students are also taking BIOB160, the materials provided by the UM bookstore- the all inclusive access- will be appropriate for this course.**

Computers and Course Website Information

Students are expected to be familiar with computers and the Internet. Students are responsible for their own software and computer equipment maintenance and setup as recommended by the University of Montana.

<http://umonline.umt.edu/student-support.php>

Class-Specific Computer and Software Requirements:

- Students will complete activities in the University of Montana Moodle BIOB160 course website and in Mastering Biology. Students are expected to have a 'back up plan' if personal computers become compromised.
- The University of Montana maintains several computer labs on campus:
<http://www.umt.edu/it/support/computerlabs/default.php>
- Students are expected to download copies of course information from the Moodle website and to check email for class announcements.

- **For technical support for using Moodle, please contact UM IT support:**
<http://www.umt.edu/it/support/default.php>

Course Policies

Dr. Minns and the Laboratory Instructors follow academic policies as stated in the 2017-2018 UM Catalog. Students are responsible for being familiar with these policies.

<http://www.umt.edu/catalog/>

These policies include but are not limited to:

- Student Conduct (http://life.umt.edu/vpsa/student_conduct.php)
- Class attendance
- Credit/No Credit Grading
- No more than 18 CR credits may be counted toward graduation. Courses taken to satisfy General Education Requirements must be taken for traditional letter grade. Courses required for the student's major or minor must be taken for traditional letter grade, except at the discretion of the department concerned.
- A CR is given for work deserving credit (A through D-) and an NCR for work of failing quality (F). CR and NCR grades do not affect grade point averages. The grades of CR and NCR are not defined in terms of their relationship to traditional grades for graduate course work.
- Election of the credit/no credit option must be indicated at registration time or within the first 15 class days on CyberBear. After the fifteenth day, but prior to the end of the 30th day of instruction, an undergraduate student may change a credit/no credit enrollment to an enrollment under the A F grade system, or the reverse by means of a drop/add form.
- The University cautions students that many graduate and professional schools and some employers do not recognize non traditional grades (i.e., those other than A through F) or may discriminate against students who use the credit/no credit option for many courses. Moreover, students are cautioned that some degree programs may have different requirements regarding CR/NCR credits, as stipulated in the catalog.
- Audit
- Incomplete Grading Policy

Plagiarism

- Plagiarism is the representing of another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and may be remanded to Academic Court for possible suspension or expulsion. (See Student Conduct Code section of this catalog.)
- Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed wording but also ideas. Acknowledgment of whatever is not one's own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own original work is plagiarism.

Students with Disabilities:

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommason Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Cell Phones and other electronic devices

The use of cell phones and other electronic devices (including cameras, video recorders) is STRICTLY prohibited during all class times, including examinations.

Disruptive behavior

Students who are being disruptive by talking, texting or playing computer games will be asked to leave the classroom. Such behaviors impact the learning of other students in the classroom and will not be tolerated. Re-admittance to class is at the discretion of the instructor.

Evaluation Methods:

Your course grade will be determined by your performance in the laboratory activities and a final paper.

The number of points you earn/300 total points will determine your laboratory grade. The breakdown of grades from each lab is located in the important dates section of this syllabus.

Grading System:

Final Grades will be based upon your # of points earned/ 250 points.

| Activity | # of points |
|---------------------------------------------------------------|-------------|
| Laboratory Activities (14 labs*20 points, drop one lowest) | 260 |
| Research Summary | 40 |
| Total # of points | 300 |

| Grades will be calculated based upon the following system: | |
|------------------------------------------------------------|-------------------------|
| Grade | Percent of Total Points |
| A | 94-100% |
| A- | 90-93% |
| B+ | 87-89% |
| B | 84-86% |
| B- | 80-83% |
| C+ | 77-79% |
| C | 74-76% |
| C- | 70-73% |
| D+ | 67-69% |
| D | 64-66% |
| D- | 60-63% |
| F | 59% and Below |

Make-up Work

Missed laboratories cannot be made up for any reason. Make up work is not available for missed or incomplete labs. The one lowest lab grade will be dropped during the calculation of final grades. If you have to miss a lab due to any reason, that lab will be the lowest grade dropped from your final grade.

Late Work Policy

Late work is not accepted in this class due to the condensed nature of the course.

Laboratory Activities

- In this course, you will practice good laboratory notebook habits and laboratory preparation in order to attempt each lab exercise.
- All laboratory exercises must be taped or glued into your lab notebook prior to the week's labs. As you complete each lab exercise, you are expected to take notes and complete the lab activities. You are graded on your presentation of a prepared notebook prior to the start of the day's lab. If you do not have your lab exercises pasted into your lab notebook or you forget your lab notebook, you must take notes on your own and add them to the notebook prior to the next lab's meeting. You will lose points for each lab that is missing lab activities or that is not prepared in advance.
- Laboratory activities CANNOT be made up for any reason.
- Missed labs CANNOT be made up.
- You must attend the lab in which you are officially registered. Attending additional lab sections beyond the one in which you are registered for is NOT permitted.
- Late work policy: Late work is NOT accepted and no credit will be given for work completed after the deadlines.
- Lab notebooks MUST be turned into your lab TA each Thursday for grading over the weekend. Your lab TA will describe the method for turning in and collecting your laboratory notebooks.
- Grading rubrics for each lab are located at the end of the lab worksheets.
- Professional and courteous behavior is expected in each lab. During some labs, we deal with dangerous substances and horseplay or disruptive behavior is strictly prohibited.
- If students are not prepared for labs, students will be tested with a laboratory quiz prior to the start of the lab. The quiz grade will be worth 50% of that day's lab and the lab exercise will be worth 50% for that day. In other words, students will earn 10 points from the quiz and 10 points from the lab exercise (instead of 20 points for the lab exercise).

Correspondence

An official UM student email address must be used for all correspondence.

Access to the Laboratory Outside of Regularly Scheduled Class Hours

Access outside of your scheduled lab is not permitted. If you miss your scheduled lab, you may not attend an alternative lab.

Laboratory Safety

- 1) In case of an emergency, dial extension 4000 to report serious injuries.
- 2) First Aid supplies are available in the lab. Your lab TA will show you the location of these supplies during the first lab.
- 1) No open-toes shoes or sandals are allowed in the lab. Wear shoes that cover your entire foot.
- 2) Laboratory coats, gloves and eye protection are available in the lab.
- 3) Contact lens wearers should be aware that chemical fumes can pass into gas permeable and soft lenses. These fumes irritate the cornea. Protective glasses (prescription or safety glasses) are recommended to protect against chemical splashes. Know the location of the eyewash station before you begin.
- 4) No foods, drinks, gum or the application of makeup are allowed in the lab.
- 5) Wash hands prior to leaving the lab.

Important Dates and Assigned Readings (this may be amended by Dr. Minns and your TA during the Semester)

Lab Schedule (points earned)

| Day of the week | Dates | Monday | Points available | Points earned |
|-----------------|---------|--------------------------------------------------------------------------------------------|------------------|---------------|
| Tuesday | May 15 | Introduction to the lab/Safety/Expectations Syllabus review | | |
| Wednesday | May 16 | Lab 1: What is Science? (Check Game) | 20 | |
| Thursday | May 17 | Lab 2: What is Science II? Measurements | 20 | |
| Tuesday | May 22 | Lab 3: Soap Part I | 20 | |
| Wednesday | May 23 | Lab 4: Osmosis and Diffusion | 20 | |
| Thursday | May 24 | Lab 5: Enzyme Lab/lactase | 20 | |
| Tuesday | May 29 | Lab 3 (cont): Soap II Cleanup/Catch up day Finding Peer-reviewed Journal Articles | 20 | |
| Wednesday | May 30 | Lab 6: DNA Lab:Strawberry DNA | 20 | |
| Thursday | May 31 | Lab 7: Photosynthesis | 20 | |
| Tuesday | June 5 | Lab 8: Microbial Fuel cells | 20 | |
| Wednesday | June 6 | Lab 9: Tazmanian Wolf | 20 | |
| Thursday | June 7 | Lab 10: Part I Biomimicry lab Research Summary Due | 20 | |
| Tuesday | June 12 | Lab 11: Cricket Mark/recapture | 20 | |
| Wednesday | June 13 | Lab 10: Part II Biomimicry lab part 2 presentations | 20 | |
| Thursday | June 14 | Biomimicry Presentations/ | 20 | |

| <p align="center">Peer-reviewed Review Article Summary Rubric</p> <p>Select a peer-reviewed REVIEW article focused on a biology topic of your choice. Choices can include any type of biology that is interesting to you. Talk with your TA about topic choices. In two pages (12 point font, 1.5 line spacing) describe key topics covered in the REVIEW article. Use your own words and include in-text citations.</p> | | | <p align="center">(writing topics: summarizing peer-reviewed journal articles)</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------|
| | <p align="center">Available Points</p> | <p align="center">Points Earned</p> | <p align="center">Comments</p> |
| <p align="center"><u>Introduction</u></p> <p>Describe the journal and why you selected it (do not write in the first person though). Describe why the topic covered in the review article is important to the field of biology you are most interested in learning more about.</p> | <p>5</p> | | |
| <p><u>Main points of the Review Article</u></p> <p>In your own words, describe the main topics covered by the journal article. You should include three-five paragraphs that summarize the key points of the article. DO NOT COPY and PASTE. Summarize in your own words. Each fact from the article should have an in-text citation (Author, year).</p> | <p>10</p> | | |
| <p align="center"><u>Conclusion</u></p> <p>Summarize the key findings of the review article and why they are important in the biology field of your choice.</p> | <p>5</p> | | |
| <p align="center"><u>Referencing</u></p> <p>Credible In-text citations and full length reference at the end . You may use any formatting system you wish, however, you must include: Author(s), Title of article, Journal Name, year of publication, volume, issue #, pages</p> | <p>5</p> | | |
| <p align="center"><u>Writing Mechanics</u></p> <p>Proper writing mechanics Do not write in 3rd person. Appropriate US grammar is used throughout. Use Headings for each section.</p> | <p>5</p> | | |
| <p align="center"><u>Original Paper Attached</u></p> | <p>10</p> | | |
| <p align="center">Total</p> | <p>40</p> | | |