

Course Title: Principles of Biology: Organisms to Ecosystems

Course Number: BIOL 2102

Course Credits: 3

Term: Fall 2023

Section 001 Meeting Times: MWF 10:00 AM – 10:50 AM

Section 001 Location: WOOD 101

Section 002 Meeting Times: MWF 3:00 PM – 3:50 PM

Section 002 Location: SMLC 102

First Half Course Instructor: Moses Michelsohn (he/him)

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First Half Course Instructor Office: CAST 66

Second Half Course Instructor: Dr. Lisa Barrow (she/her)

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Course Instructor Student Drop-in Hours: By appointment (scheduling links on Canvas)

Course Description: The Biology Introductory Series (BIOL 2101, 2102, and 2103L) introduces undergraduate students to the breadth of topics investigated in the field of biology. BIOL 2102 is an introduction to 1) basic evolutionary principles underlying the diverse array of organisms observed in nature, 2) the structural and physiological solutions to fundamental problems in organismal biology, and 3) the principles and characteristics of population, community, and ecosystem ecology.

Course Goals: Students enrolled in BIOL 2102 will:

- 1) develop a fundamental understanding of the process of evolution by natural selection, the formation of species, and the historical processes giving rise to the diversity of extant multicellular organisms.
- 2) gain familiarity with the relationships between form and function in multicellular organisms and the processes used by different taxonomic groups to solve fundamental problems faced by all organisms.
- 3) build a basic understanding of the processes that govern the characteristics and functions of populations, communities, and ecosystems.

Student Learning Outcomes: Students who complete BIOL 2102 will be able to demonstrate a coherent understanding of:

- 1) evolution by natural selection and the process of species formation.
- 2) topological representation of species diversification through time (phylogenetic tree-thinking).
- 3) the relationship between tissues, organs, and organ systems from a structural, functional, and evolutionary perspective.
- 4) how multicellular organisms obtain energy from their environment.
- 5) resource distribution in multicellular organisms.
- 6) how organisms sense and respond to environmental stimuli.
- 7) the variation in reproductive cycles across multicellular organisms.
- 8) the hierarchical organization of ecology from organisms to the biosphere.
- 9) how population growth is measured and how it is influenced by demography and life history.
- 10) the diversity and dynamics of species interactions and food webs.
- 11) how abiotic factors influence the diversity and distribution of biomes.
- 12) how human activities have impacted ecosystem function, ecosystem services, biodiversity, and biogeochemical cycles.

Required Materials: Students enrolled in BIOL 2102 are required to obtain the following materials:

- ❖ Urry, L. A., M. L. Cain, S. A. Wasserman, & P. V. Minorsky (2022) *Campbell Biology in Focus*, 3rd edition. Pearson.
- ❖ iClicker+ Student Remote (or compatible device or application)

Course Requirements: This course includes multiple opportunities for students to engage with the material and receive feedback on their performance. Learning requires time and practice. These course requirements are designed to emphasize engagement with concepts in-class (PA), practicing material at students' own pace outside of class (RQ), and assessing student understanding regularly (EX). The lowest scores in each of these grade categories will be dropped allowing students some flexibility throughout the semester (additional details below).

Student performance in BIOL 2102 is based on the following:

- ❖ **Lecture Participation (PA):** Students are required to attend each lecture and engage with the presented material. Student participation will be assessed using iClicker questions throughout the lectures. Students are responsible for registering their iClickers, bringing their iClickers to lecture in working order, and setting their devices to the proper channel. Students should actively track their Lecture Participation scores to ensure their participation is recorded. The lowest four scores (of 40 total) will be dropped for each student.
- ❖ **Reading Quizzes (RQ):** Students are required to read assigned sections of the textbook or supplementary materials provided online prior to attending lecture. Students are required to complete a Reading Quiz online each week. This assignment will include a combination of questions reviewing previously discussed topics and material included in readings for the upcoming week. Reading Quizzes will open at 12:00pm on Fridays and must be completed by 11:59pm on Sundays. The lowest four scores (of 14 total) will be dropped for each student.
- ❖ **Examinations (EX):** Students are required to complete six in-class examinations during the semester. Examinations will emphasize material covered in the previous 2 – 3 weeks, but may include any material covered in BIOL 2102 at the time of the exam (knowledge in biology is often cumulative). There is no final exam in BIOL 2102. The lowest score (of 6 total) will be dropped for each student.
- ❖ **Biology Course Surveys (EC):** Students complete two course surveys during the semester – a pre-survey at the start of the semester and a post-survey at the end of the semester. These surveys collect data on student progression in the biology program, comprehension of topics in this and other required courses in the biology major, student reflections, and student comments. Student performance on these surveys is based on completion not on evaluated competency. Anonymized results of these surveys are used by the Department of Biology to evaluate and revise the program. Students can earn a 1% bonus to their course grade for completion of each survey.

Student Time Management: Learning new concepts that cover a broad range of topics in biology takes time and practice. Students are expected to spend approximately 6 hours working on course materials outside of their scheduled lecture sections each week. Lecture Participation and Reading Quizzes contribute to course grades and help students identify knowledge gaps in preparation for Examinations. The course instruction team is dedicated to helping you achieve success in this course. Students that feel their efforts in this course are not reflected in their current grade are encouraged to reach out to their course instructors to help develop strategies to improve their performance. Students are

encouraged to review the Graduate Teaching Assistant Drop-in Hours (posted online) while planning when to work on their assignments.

Attendance and Late Work: Students are expected to attend all lectures each semester to maximize success in the course. Students are required to arrive on-time to their lecture section every time, and are expected to remain in class for the duration of their scheduled section. Students that arrive late may miss the opportunity to record their participation. Students that choose to leave early may also credit for attendance.

Students that miss a lecture session will receive a zero for the Lecture Participation grade associated with that lecture session. All late work in BIOL 2102 will receive a zero. All Reading Quiz assignments are completed online and will not allow student access following their due dates.

The lowest four scores on Lecture Participation, the lowest four scores on Reading Quizzes, and the lowest score on an Examination are dropped for all students. This grading scheme gives students multiple chances to miss lecture during the semester without serious implications for their course grade (zeros on these assignments dropped as lowest grades). Students who miss lecture do not need to contact their Course Instructor following a missed lecture.

Students who miss an examination for an excused reason (Medical, Bereavement, Armed Services, UNM Athletics, Traditional Obligation, etc.) must submit an absence report to the Course Instructor in a timely fashion (refer to online instructions) to arrange an alternative.

Course Grades: Students are responsible for actively tracking their grades online. Students with grade concerns should address them with their Course Instructor as soon as possible upon receiving graded work. All grades are considered permanent 2 weeks after a grade is assigned. Students are responsible for adhering to all UNM grade policies. This course is not offered for Credit/No Credit.

Course Grading Scheme

Assignment Name	Iterations	Drops	Grade Portion
Lecture Participation	40	Four lowest scores	20%
Reading Quizzes	14	Four lowest scores	20%
Examinations	6	One lowest score	60%
Biology Course Surveys	2	N/A	Up to 2% Extra Credit

Semester Grading Scheme

Grade Range	0 -59.49	59.5 -67.49	67.5 -69.49	69.5 -77.49	77.5 -79.49	79.5 -87.49	87.5 -89.49	89.5 -97.49	97.5+
Letter Grade	F	D	D+	C	C+	B	B+	A	A+

UNM Accommodations Statement: UNM is committed to providing equitable access to learning opportunities for students with documented disabilities. As your instructor, it is my objective to facilitate an inclusive classroom setting, in which students have full access and opportunity to participate. To engage in a confidential conversation about the process for requesting reasonable accommodations for this class and/or program, please contact Accessibility Resource Center at arcsrvs@unm.edu or by phone at 505-277-3506.

UNM Citizenship and/or Immigration Status Statement: All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: <http://undocumented.unm.edu/>.

UNM Connecting to Campus and Finding Support Statement: UNM has many resources and centers to help you thrive, including opportunities to get involved, mental health resources, academic support such as tutoring, resource centers for people like you, free food at Lobo Food Pantry, and jobs on campus. Your advisor, staff at the resource centers and Dean of Students, and I can help you find the right opportunities for you.

UNM Credit-hour Statement: This is a three credit-hour course. Class meets for three 50-minute sessions of direct instruction for fifteen weeks during the Fall 2023 semester. Please plan for a minimum of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

UNM Land Acknowledgement: Founded in 1889, the University of New Mexico sits on the traditional homelands of the Pueblo of Sandia. The original peoples of New Mexico Pueblo, Navajo, and Apache since time immemorial, have deep connections to the land and have made significant contributions to the broader community statewide. We honor the land itself and those who remain stewards of this land throughout the generations and also acknowledge our committed relationship to Indigenous peoples. We gratefully recognize our history.

UNM Respectful and Responsible Learning Statement: We all have shared responsibility for ensuring that learning occurs safely, honestly, and equitably. Submitting material as your own work that has been generated on a website, in a publication, by an artificial intelligence algorithm, by another person, or by breaking the rules of an assignment constitutes academic dishonesty. It is a student code of conduct violation that can lead to a disciplinary procedure. Please ask me for help in finding the resources you need to be successful in this course. I can help you use study resources responsibly and effectively. Off-campus paper writing services, problem-checkers and services, websites, and AIs can produce incorrect or misleading results. Learning the course material depends on completing and submitting your own work. UNM preserves and protects the integrity of the academic community through multiple policies including policies on student grievances (Faculty Handbook D175 and D176), academic dishonesty (FH D100), and respectful campus (FH CO9). These are in the Student Pathfinder (<https://pathfinder.unm.edu>) and the Faculty Handbook (<https://handbook.unm.edu>).

UNM Title IX Statement: Our classroom and our university should always be spaces of mutual respect, kindness, and support, without fear of discrimination, harassment, or violence. Should you ever need assistance or have concerns about incidents that violate this principle, please access the resources available to you on campus. Please note that, because UNM faculty, TAs, and GAs are considered "responsible employees" any disclosure of gender discrimination (including sexual harassment, sexual misconduct, and sexual violence) made to a faculty member, TA, or GA must be reported by that faculty member, TA, or GA to the university's Title IX coordinator. For more information on the campus policy regarding sexual misconduct and reporting, please see: <https://policy.unm.edu/university-policies/2000/2740.html>.

Course Schedule Fall 2023

Week	Date	Lecture Topic and Assigned Readings
01	Aug 21	Lecture Topic: Descent with Modification Readings: Campbell 1
	Aug 23	Lecture Topic: The Struggle for Existence Readings: Campbell 19, 23.4
	Aug 25	Lecture Topic: Species Concepts Readings: Campbell 22
02*	Aug 28	Lecture Topic: The Speciation Process Readings: Campbell 20, 30.3
	Aug 30	Lecture Topic: Origins of Complex Multicellularity Readings: Campbell 25.2, 25.3
	Sep 01	Examination 1 (EX-01)
03	Sep 04	No Lecture: Labor Day
	Sep 06	Lecture Topic: Diversity of Autotrophs Readings: Campbell 26.1, 26.3, 26.4
	Sep 08	Lecture Topic: Diversity of Heterotrophs Readings: Campbell 26.2, 26.5, 27
04	Sep 11	Lecture Topic: Cells, Tissues, & Organs Readings: Campbell 28.1, 32.1
	Sep 13	Lecture Topic: Structural Support in Plants Readings: Campbell 28
	Sep 15	Lecture Topic: Structural Support in Animals Readings: Campbell 39.2
05	Sep 18	Lecture Topic: Motility Readings: Campbell 30.1, 39
	Sep 20	Lecture Topic: Resource Acquisition Readings: Campbell 8
	Sep 22	Lecture Topic: Homeostasis Readings: Campbell 32
06	Sep 25	Examination 2 (EX-02)
	Sep 27	Lecture Topic: Excretory and Digestive Systems Readings: Campbell 32, 33
	Sep 29	Lecture Topic: Vascular Systems Readings: Campbell 29
07	Oct 02	Lecture Topic: Respiratory and Circulatory Systems Readings: Campbell 34
	Oct 04	Lecture Topic: Sensory Systems in Plants Readings: Campbell 31.2, 31.3, 31.4, 38.4
	Oct 06	Lecture Topic: Sensory Systems in Animals Readings: Campbell 37, 38
08*	Oct 09	Lecture Topic: Immune Systems Readings: Campbell 31.4, 35
	Oct 11	Examination 3 (EX-03)
	Oct 13	No Lecture: UNM Fall Break

Week	Date	Lecture Topic and Assigned Readings
09	Oct 16	Lecture Topic: Hormones in Plants Readings: Campbell 31
	Oct 18	Lecture Topic: Life Cycles Readings: Campbell 25.3, 26.1, 26.2
	Oct 20	Lecture Topic: Sexual Reproduction Readings: Campbell 10.2, 30.2, 36
10	Oct 23	Lecture Topic: Growth and Development Readings: Campbell 23.3, 28.3, 28.4, 31.1, 36.4,
	Oct 25	Lecture Topic: Hierarchical Organization of Ecology Readings: Campbell 1.1
	Oct 27	Lecture Topic: Population Dynamics Readings: Campbell 40.4, 40.5
11*	Oct 30	Lecture Topic: Demography Readings: Campbell 40.3, 40.4
	Nov 01	Examination 4 (EX-04)
	Nov 03	Lecture Topic: Life History Strategies Readings: Campbell 40.6
12	Nov 06	Lecture Topic: Evolution in Populations Readings: Campbell 21
	Nov 08	Lecture Topic: Biological Communities Readings: Campbell 41
	Nov 10	Lecture Topic: Species Interactions Readings: Campbell 26.5, 41.1
13	Nov 13	Lecture Topic: Energy Flow in Ecosystems Readings: Campbell 42
	Nov 15	Lecture Topic: Ecological Succession Readings: Campbell 41.3
	Nov 17	Examination 5 (EX-05)
14	Nov 20	Lecture Topic: Distribution of Biomes Readings: Campbell 40.1, Figure 40.9, 40.2, Figure 40.11
	Nov 22	No Lecture: Thanksgiving
	Nov 24	No Lecture: Thanksgiving
15	Nov 27	Lecture Topic: Patterns of Biodiversity Readings: Campbell 40.1, 40.2, 40.3, 40.4, 41.4
	Nov 29	Lecture Topic: Ecosystem Function and Ecosystem Services Readings: Campbell 42.5, 43.1
	Dec 01	Lecture Topic: Biogeochemical Cycles Readings: Campbell 42.4
16*	Dec 04	Lecture Topic: History of the Biosphere Readings: Campbell 23.1, 23.2, 43.4
	Dec 06	Lecture Topic: Conservation Biology Readings: Campbell 42.5, 43.2, 43.3, 43.5, 43.6
	Dec 08	Examination 6 (EX-06)
17	Dec 11 – Dec 15	No Lecture Sections Final Exams (BIOL 2102 does not have a Final Exam)