Arizona State University
BIO 182 – GENERAL BIOLOGY II
Spring Semester 2018

Welcome to the General Biology program at Arizona State University's Downtown Phoenix Campus! This course is the second of an integrated two-semester series that is designed to provide students with a rigorous and in-depth understanding of biological concepts and principles. BIO 182 (SUN# BIO 1182) is "big" biology in that we'll tackle the large-scale processes that drive evolution, organismal diversity, and the interactions of these organisms with each other and their environments. The first course in the series, BIO 181 (SUN# BIO 1181), addresses the "small" biology concepts of biological chemistry and how it pertains to the molecular and cellular bases of life. The General Biology curriculum at the Downtown Phoenix Campus is comparable to that of the same or similar courses at other ASU campuses and non-affiliated institutions.

BIO 182 provides four units of credit that satisfy the SG general studies requirement, as well as a portion of the requirements for many life and health-related science degrees. The course is intended for students majoring in life science disciplines, though it may be of value to well-prepared individuals interested in a thorough treatment of the science of biology.

This course is offered by the College of Integrative Sciences and Arts at Arizona State University's Downtown Phoenix Campus. For more information about the college, visit our web site at http://cisa.asu.edu. If you have questions or concerns about the course, please send your inquiries to the instructors of record, Dr. Cayle Lisenbee or Dr. Tonya Penkrot (contact information follows).

INSTRUCTOR INFORMATION

Lecturer:	Dr. Cayle Lisenbee	**E-mail:**	lisenbee.cayle@asu.edu
Office:	UCENT 355	**Telephone:**	(602) 496-0641
Lecturer:	Dr. Tonya Penkrot	**E-mail:**	tpenkrot@asu.edu
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Instructional Aides:	Alyssa Anderson (acande15@asu.edu), Payton Bulatovich (pbulatov@asu.edu), Jennifer Burgdorf (jlburgdo@asu.edu), Lauren Cotter (lecotter@asu.edu), Jacob Gaare (jgaare@asu.edu), Infynity Hill (ihill1@asu.edu), Sarah Lauchnor (slauchno@asu.edu), Autumn Peck (apeck4@asu.edu), Brogan Taylor (btaylo20@asu.edu), Dina Ziganshina (dziganshi@asu.edu)		
Office:	UCENT 360 (Science Hub)	**Telephone:**	(602) 496-0658

Office hours for all instructors are posted on the course Blackboard site. We also are happy to schedule an appointment if our formal office hours do not fit your schedule. Please feel free to work with any of us!

LEARNING OBJECTIVES

Achievement of a passing letter grade in this course signifies your mastery of the following learning objectives.

- *Inheritance and Evolution* – Describe the patterns and processes of evolution and understand how they provide a foundation for the study of biology.
- *Speciation and Phylogeny* – Explore how evolutionary processes lead to the emergence of new species and how they have shaped the history and foundations of life on Earth.
- *Plant and Animal Diversity* – Summarize the key factors that allow biologists to distinguish Earth's plants and animals, including humans.
- *Ecology and Conservation* – Examine the complexity, necessity, and fragility of interactions between the biotic and abiotic components of Earth's ecosystems and consider solutions that may help conserve them for future generations.

Each of these four learning objectives correlates with one of the four units of material covered in the course (see the "Lecture Schedule" at the end of this syllabus). Detailed learning objectives within each unit may be found on the course Blackboard site.

CLASS MEETING TIMES & LOCATIONS

Lectures: Tue/Thu 1:30–2:45 pm (Penkrot) and 3:00–4:15 pm (Lisenbee), HLTHN 110

Honors Recitation: Time, day, and location to be determined. Please ask us about honors credit!

Labs: You must attend the lab section for which you are enrolled. If you'd like to attend a different section, please change your enrollment during the add/drop period at the start of the term.

Lab Sections: Penkrot

Class	Day	Start	End	IA	Room
18251	Wed	11:50 am	2:40 pm	Ziganshina	UCENT 375
18252	Wed	3:05 pm	5:55 pm	Burgdorf	UCENT 375
18253	Thu	10:30 am	1:20 pm	Peck	UCENT 375
18254	Fri	7:30 am	10:20 am	Cotter	UCENT 375
20417	Fri	10:45 am	1:35 pm	Bulatovich	UCENT 375
20418	Fri	2:00 pm	4:50 pm	Taylor	UCENT 375

Lisenbee

Class	Day	Start	End	IA	Room
18245	Wed	8:35 am	11:25 am	Bulatovich	UCENT 375
18246	Wed	6:05 pm	8:55 pm	Gaare	UCENT 375
18247	Thu	7:30 am	10:20 am	Lauchnor	UCENT 375
18248	Thu	4:30 pm	7:20 pm	Hill	UCENT 375
18249	Fri	10:45 am	1:35 pm	Burgdorf	UCENT 371
18250	Fri	2:00 pm	4:50 pm	Anderson	UCENT 371

COURSE MATERIALS

Textbook: *Biology* by OpenStax College (2013). Digital version available free online within WileyPLUS and at http://cnx.org/content/col11448/latest/. Print version available for separate purchase (not required) in DPC book store.

Lab Manual: *Investigating Biology* 8th ed. (custom) by Judith Morgan and Eloise Carter (2014). Pearson Benjamin Cummings, San Francisco, CA.

WileyPLUS: http://my.asu.edu (links available within Blackboard). Please see Blackboard for instructions *before* registering!

Blackboard: Class announcements, lecture notes, homework and pre-lab assignments, lab handouts, study materials, and more will be posted online on Blackboard. To access the site, log in at http://my.asu.edu with your ASURITE ID and password and then click on the course name ("General Biology II") or the Blackboard link within the "My Classes" section. Please check the site regularly!

ASSIGNMENTS, EXAMS, & GRADING

Lecture	Points
Extra Credit	see below
Pre-Lecture Practice	50
Homework	100
Unit Exams (4)	400
Final Exam	50
Total	600

Lab	Points
Pre-Lab Worksheets	50
Lab Exercises	100
Drawings	50
Lab Reports	100
Practical Exams (2)	100
Total	400

Assignments

Lecture – Three types of projects are associated with the lecture portion of the course. Extra credit may be assigned to encourage your regular attendance and study and review of the material at home. These tasks will not contribute to the total number of points available in the course, but they will increase the total number of points you accumulate. Extra credit tasks will be assigned randomly and together will constitute no more than

30 extra credit points (5% of the lecture total). Pre-lecture practice activities constitute a series of adaptive learning exercises that will familiarize you with the material to be discussed in lecture and show you with robust analytics the specific topics that require further attention in your studies. Pay close attention to the due dates for pre-lecture practice activities: they are intended to motivate your independent study and learning of the material outside of class *before* lecture, as well as follow-up work after our class discussions. Homework will be assigned prior to each exam to allow you to practice your biological problem-solving skills and thus ensure difficult concepts have been cemented for the tests. All pre-lecture practice and homework assignments will be administered via WileyPLUS, so please be certain that you purchase and activate your subscription before the end of the first full week of classes! *Extra credit, pre-lecture practice, and homework opportunities may be assigned, completed, and collected in class if time constraints and/or the availability of WileyPLUS resources prevent us from administering these items online.*

Lab – Four types of assignments will be utilized in the laboratory. Pre-lab worksheets will be administered online via the course Blackboard site. These brief assignments are designed to encourage pre-reading of the lab exercises so that you arrive to each lab period prepared for class and aware of all safety and procedural details. *The importance of pre-reading the lab exercises cannot be overemphasized!* Bring your lab manual to every lab meeting; this is where you will record your data and observations (a formal lab notebook is not required for the course). These entries will constitute weekly lab exercise assignments that will be collected by your lab instructor at the start of the following week's lab period. Several lab exercises also will require you to produce high-quality biological drawings. Your drawings will be scored separately according to their ability to convey accurately the biological specimens and/or concepts under study. Lastly, your data collection and interpretation activities will be chronicled in lab reports that exhibit the essential elements of standard scientific papers. These important assignments will consist of a progressive series of small writing tasks that will culminate in the writing of a complete research paper. Further details will be discussed in lab. Please provide a standard manila folder for collecting and submitting your writing assignments. Your lab instructor will label the folder's tab.

Exams & Practicals

Lecture – Four unit exams will be administered at regular intervals throughout the semester. Each exam will consist of multiple choice questions on topics covered in the assigned reading and lecture. All four unit exams will count towards the final grade. Your score for Unit Exam 4 may "resurrect," or replace, the lowest of your first three unit exam scores if both of the following apply: a) your score for Unit Exam 4 is higher than your lowest unit exam score, and b) the score to be replaced is greater than zero (Unit Exam 4 cannot replace a score of zero that was received due to an unexcused absence). Unit Exam 4 will be held on the date specified by the university's final exam schedule. It will be accompanied by a separate cumulative Final Exam that will be scored independently.

Lab – Two practical exams will be administered during the second half of the term. Each will include short answer questions that assess your ability to identify biological specimens and/or techniques and principles learned in the lab. Further details will be discussed in lab.

The following guidelines will be enforced to encourage fairness and honesty for paper exams and practicals:

- No materials of any kind are to be visible at your desk during testing. Please place all book bags, purses, textbooks, and notes under your desk and out of sight.
- Turn off or mute and stow all cell phones and other electronic devices, including laptops, tablets, and music players, prior to the start of an exam or practical. These devices may not be used during the testing period. You may forfeit your right to finish an exam if you fail to abide by this policy.
- No student will be permitted to start an exam late after the first person finished has left the testing room. Please arrive on time for your exams and practicals!
- You will not be allowed to leave the testing room if you intend to return during the testing period. Be sure to grab a snack and visit the restroom before you arrive.
- Bring your ASU ID card to each exam – you may be asked to enter your ASU ID number on your test papers until we get to know you individually.

A few additional words of advice are necessary for online assignments:

- Pay close attention to all instructions and due dates, and add the latter to your personal calendars. Retakes or resets will not be allowed for students that miss deadlines for unexcused reasons!

- Ensure that your connection to the Internet is stable *before* starting an online assignment. You may have only one attempt to complete an assignment and therefore may forfeit your ability to complete it if your connection fails.
- If necessary, be sure to download and/or print all handouts *before* starting an online assignment to avoid being locked out of the task if you navigate to a different page to open associated materials. If you need to follow links and/or refer to materials online, be sure to open them in a new window or tab in your web browser.
- Rules for academic honesty apply to online assignments. All instances of cheating, copying, or other forms of covert or blatant dishonesty will be treated the same as for paper assignments in class.

Grading
Your letter grade will be determined entirely by the number of points you earn. Point totals may be tallied periodically throughout the semester, but these totals will not be converted to letter grades until all points have been distributed in the course. We will perform these conversions very carefully according to the following grading scale, but please note that this scale provides a reference only and may be adjusted at our discretion if aggregate scores suggest it to be inadequate. The +/- system may be utilized to distinguish levels of academic achievement.

Content	Course %	Grade %	Letter
Lecture	60	90-100	A
Lab	40	80-90	B
		70-80	C
		60-70	D
		below 60	E

ATTENDANCE & MAKE-UP POLICIES

Lecture Attendance
Attending lecture is an important component of successfully mastering the content presented in a majors-level science course. Our presentations frequently will include material that you may not be able to locate readily in the assigned reading, and they always will provide clear indications of the material that we feel is most important for learning key concepts. Our lectures also will incorporate a great deal of discussion-based learning, but this is effective only when students are present in the classroom! Please let us know if you need to miss a lecture so that we can help you stay current with missed material.

Lab Attendance
Completing all of the lab exercises is essential to performing well in this course. Please arrive for lab on time, and *plan on remaining in the lab for the entire lab period.* Attendance will be monitored at each lab meeting. Students that arrive more than 15 minutes late may forfeit the opportunity to complete graded activities and/or submit work that is collected at the start of the lab session. We will defer to your lab instructor's decisions on all aspects of the lab, so please treat him/her with the same respect that you extend to us!

Absence & Make-up Policies
The lecture portion of the course includes multiple opportunities for acquiring points such that missed assignments rarely require special accommodations. Extra credit tasks and pre-lecture practice assignments, in particular, will not be eligible for make-ups; no exceptions to this rule will be offered. The WileyPLUS Learning Space provides lots of additional opportunities for studying the material that appears on missed pre-lecture practice and homework assignments. The "resurrection" policy that may improve your lowest unit exam score in most cases prevents the need for make-up exams. Likewise, make-up opportunities for labs typically are not available because most exercises include group activities, complicated materials, and/or extensive setups that can't be replicated for individual students.

You will receive a score of zero if an unexcused absence or tardiness forces you to miss or submit late, respectively, a graded pre-lecture practice or homework assignment, exam, pre-lab worksheet, lab exercise, lab drawing, or practical. Lab report writing assignments will be accepted up to 24 hours beyond their due date/time, but a 50% penalty will be assessed to the score achieved. Hard copy versions of late writing

assignments must be submitted to and time-stamped by the College of Integrative Sciences and Arts receptionist on the 3rd floor of the University Center building during normal business hours.

Missing more than one exam or practical, or more than three lab exercises, will result in a failing grade (not an incomplete) for the course. Excused absences include only documented illnesses and ASU sponsored events, the latter of which must be cleared with us in advance. Please note that it is your responsibility to consult with us, your lab instructor, the Blackboard site, and/or your peers in a timely manner to obtain missed lecture and lab materials.

A Gentle Warning . . .

We work very, very hard to be approachable, professional science instructors that know our students on a first-name basis. There are at least two drawbacks to this teaching style.

First, we receive an extremely large number of student inquiries, most of which arrive via e-mail. We very much welcome these communications, but it may take us a week (or sometimes longer) to respond to your e-mail messages, so it often is most efficient to address urgent matters in person before or after class or during our office hours. Do not assume that a simple e-mail message has resolved your issue! Please take the initiative to locate the answers to common course administration questions on your own; you're almost certain to find the answers faster than we can reply! **When you do send us a message via e-mail, please include in the subject line the course prefix and number, your name, and a brief phrase explaining the purpose of your message (e.g., Subject: BIO 182, Jane Doe, Homework 3 Scoring Issue).**

Second, our easy-going tone may tempt you to develop a "sugar-coated" view of our expectations and standards. Let us be clear: this will not be a watered-down version of BIO 182, but rather an immersive, fun, in-depth treatment of the discipline at the same (or higher?) level of rigor afforded to students at other campuses and institutions. Consistent study routines are essential for success!

MISCELLANEOUS INFORMATION

Course Withdrawal

Please note that unless you withdraw from the course, a letter grade will be reported at the end of the semester, even if you stop attending class without initiating a proper withdrawal. The last day to withdraw from the course and receive a letter grade of W on your transcript is April 1st (in person and online). The deadline for complete withdrawal from all spring semester courses is April 27th.

Academic Honesty

Arizona State University maintains strict standards of academic integrity. All forms of subtle or overt dishonesty will not be tolerated, including but not limited to copying another student's work, plagiarism of published literature (including Internet content), and using notes or other aides during an exam. All instances will result in the student *failing the entire course* and will be reported to the College of Integrative Sciences and Arts, the student's degree-granting college/school/department, and the Dean's Office for the Downtown Phoenix Campus. Please strive to utilize your own creativity in all of your academic endeavors.

Student Resources

If you would like additional assistance with course material, we encourage you to visit, call (602-496-4ASU), or e-mail (askdpc@asu.edu) the Student Success Center on the first floor of the University Center building to schedule an appointment with a subject area tutor. These friendly folks are ready to help and are a highly-trained, very valuable resource! In some semesters, the Center also offers online tutoring sessions and additional study resources that are coordinated through a separate Blackboard site. Do not mistake this site for the official course Blackboard site!

If you have a disability that requires assistance in lectures, labs, or during exams and practicals, please see us during the *first week of classes* so that appropriate accommodations may be arranged and verified through the university's Disability Resource Center.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed

on the basis of sex or sexually assaulted, you can find information and resources at the following web site: https://sexualviolenceprevention.asu.edu/faqs. As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish to discuss any concerns confidentially and privately.

Hints for Success

University lab science courses can be a bit daunting for the unsuspecting and unprepared. If you find yourself falling behind, try one or more of the following:

- Browse the appropriate chapters/sections of the textbook and complete the assigned pre-lecture practice activities *before* coming to class. You may find this approach uncomfortable and difficult, but don't get discouraged! It's very likely that this method will challenge your study skills and routines, and that's exactly what it should be doing! Over time, diligent pre-class work should improve your level of engagement during lecture and ease your preparation for exams. This approach is especially important for lab, too! Your ability to complete exercises safely and efficiently demands that you *pre-read the lab exercises*.
- Though it can help visual learners with memorization tasks, it's typically not productive to copy the information on our slides word-for-word during lecture because we post our notes on Blackboard as the semester progresses. Instead, take *general* notes digitally or on paper. Keywords are better than full sentences, especially if you are having trouble keeping up. Focus on writing down the examples and problems we discuss in class, especially if they don't appear in our notes. It's perfectly acceptable to avoid note-taking completely, too!
- Review your notes and/or our lectures after class and fill in important details *in your own words* that highlight the key concepts. Use these reviews and the analytics provided by the pre-lecture practice assignments on WileyPLUS as guides for more in-depth study.

And last, but certainly not least . . .

- We're known for focusing on conceptualization and application in BIO 182. Try to incorporate the following ordered routine into your study sessions: *familiarize, organize, and conceptualize.* It's very important to realize that you can't organize material with which you're not familiar, and you can't fully understand and apply concepts that aren't organized. Most common study strategies involve *familiarization* efforts: listening to a lecture, re-reading notes, memorizing facts, reviewing flash cards, etc. *Organization* tasks include re-writing notes in your own words (this forces you to interpret the information rather than simply copy it verbatim to another location), preparing outlines/study guides, building concept maps, preparing compare/contrast tables, etc. *Conceptualization* is demonstrated by your ability to use information in a new context to solve a problem, and it is the most difficult aspect to grasp and prepare. Try having a study partner ask you "What if . . ." questions that challenge you to think about the material you've learned in a new way. We are very happy to help you develop these and other study strategies this semester! Please come see us during office hours!

Disclaimer

The contents of this syllabus, particularly the lecture and lab schedules, may require revision during the semester due to unforeseen circumstances. If updates are necessary, they will be announced in class and posted to the course Blackboard site. Please note that the date and time of our last exam is set by the University to avoid scheduling conflicts during final exam week and thus cannot be changed.

LECTURE SCHEDULE (TENTATIVE)

	Wk.	Date	Lecture Topic	Assigned Reading	WileyPLUS*
UNIT 1 Inheritance, Evolution	1	Jan 9	Introduction	Syllabus	
		Jan 11	Foundations of Biology	1.1, 1.2	
	2	Jan 16	Early Theories of Inheritance	18.1	
		Jan 18	Evolution: Evidence	18.1	
	3	Jan 23	Evolution: The H-W Principle	19.1	PLP Ch. 19
		Jan 25	Evolution: Processes	19.2	
	4	Jan 30	Evolution: Processes	19.3	
		Feb 1	**Unit Exam 1**		HW 1
UNIT 2 Speciation and Phylogeny	5	Feb 6	Speciation	18.2	PLP Ch. 18
		Feb 8	Speciation	18.3	
	6	Feb 13	The History of Life	20.1, 20.2, 27.4, 47.1	PLP Ch. 20
		Feb 15	Bacteria and Archaea	22.1, 22.2, 22.3, 22.4, 22.5	PLP Ch. 22
	7	Feb 20	Protists	23.1, 23.2	PLP Ch. 23
		Feb 22	Protists	23.4	
	8	Feb 27	Fungi	24.1, 24.3, 24.4, 24.5	
		Mar 1	**Unit Exam 2**		HW 2
UNIT 3 Plant and Animal Diversity	9	Mar 6	*Spring Break – No Class*		
		Mar 8	*Spring Break – No Class*		
	10	Mar 13	Plant Diversity	25.1, 25.2	PLP Ch. 25
		Mar 15	Plant Diversity	25.3, 25.4, 26.1	PLP Ch. 26
	11	Mar 20	Plant Diversity	26.2, 26.3, 26.4	
		Mar 22	Animal Diversity	27.1, 27.2, 27.3	PLP Ch. 27
	12	Mar 27	Animal Diversity	28.1-28.5 (browse only)	
		Mar 29	Animal Diversity	29.1-29.6 (browse only)	
	13	Apr 3	Human Evolution	29.7	
		Apr 5	**Unit Exam 3**		HW 3
UNIT 4 Ecology, Conservation	14	Apr 10	An Introduction to Ecology	44.1, 44.2	PLP Ch. 44
		Apr 12	Aquatic Biomes	44.4	
	15	Apr 17	Terrestrial Biomes and Climate	44.3, 44.5	
		Apr 19	Community Ecology	45.6	
	16	Apr 24	Ecosystems	46.1, 46.2, 46.3	PLP Ch. 47
		Apr 26	Biodiversity and Conservation	45.5, 47.2, 47.3, 47.4	HW 4
	17	May 1	**Unit Exam 4 + Final Exam (2:30-4:20 pm), HLTHN 110 (Lisenbee)**		
		May 3	**Unit Exam 4 + Final Exam (12:10-2:00 pm), HLTHN 110 (Penkrot)**		

* PLP – Pre-Lecture Practice (ORION Adaptive Learning Assignments), HW – Homework. All assignments are due by 12:00 pm (noon) on the date specified.

LABORATORY SCHEDULE (TENTATIVE)

Week	Date	Lab Topic	Exercise	Writing Due
1	Jan 8-12	Lab Safety, Scientific Writing	*	Abstract
2	Jan 16-19	Data Analysis: Urban Ecology	*	
3	Jan 22-26	Experimental Design: Plant Growth Experimental Design: Animal Behavior	21 26	
4	Jan 29-Feb 2	Pop. Genetics: The H-W Principle	11	Introduction
5	Feb 5-9	Independent Study Projects	*	
6	Feb 12-16	Bacteriology *Microscopes and Cells (read only)*	12 *2*	Materials and Methods
7	Feb 19-23	Protists	13	
8	Feb 26-Mar 2	The Kingdom Fungi	17	Figures and Tables
9	Mar 5-9	*Spring Break – No Lab*		
10	Mar 12-16	Plant Diversity I: Mosses, Ferns	14	
11	Mar 19-23	Plant Diversity II: Seed Plants	15	
12	Mar 26-30	**Practical Exam 1**		
13	Apr 2-6	Animal Diversity I: Sponges, etc.	18	Results and Discussion
14	Apr 9-13	Animal Diversity II: Insects, etc.	19	
15	Apr 16-20	Vertebrate Anatomy	22-24	Full Research Paper
16	Apr 23-27	**Practical Exam 2**		

*These elements do not appear in your lab manual; additional information will be provided.